CHAPTER 6

TREATMENT SYSTEM SETTING, IMPACTS, AND MITIGATION

CHAPTER 6.0
TREATMENT SYSTEM SETTING, IMPACTS AND MITIGATION

6.1 LAND USE

6.1.1 SETTING

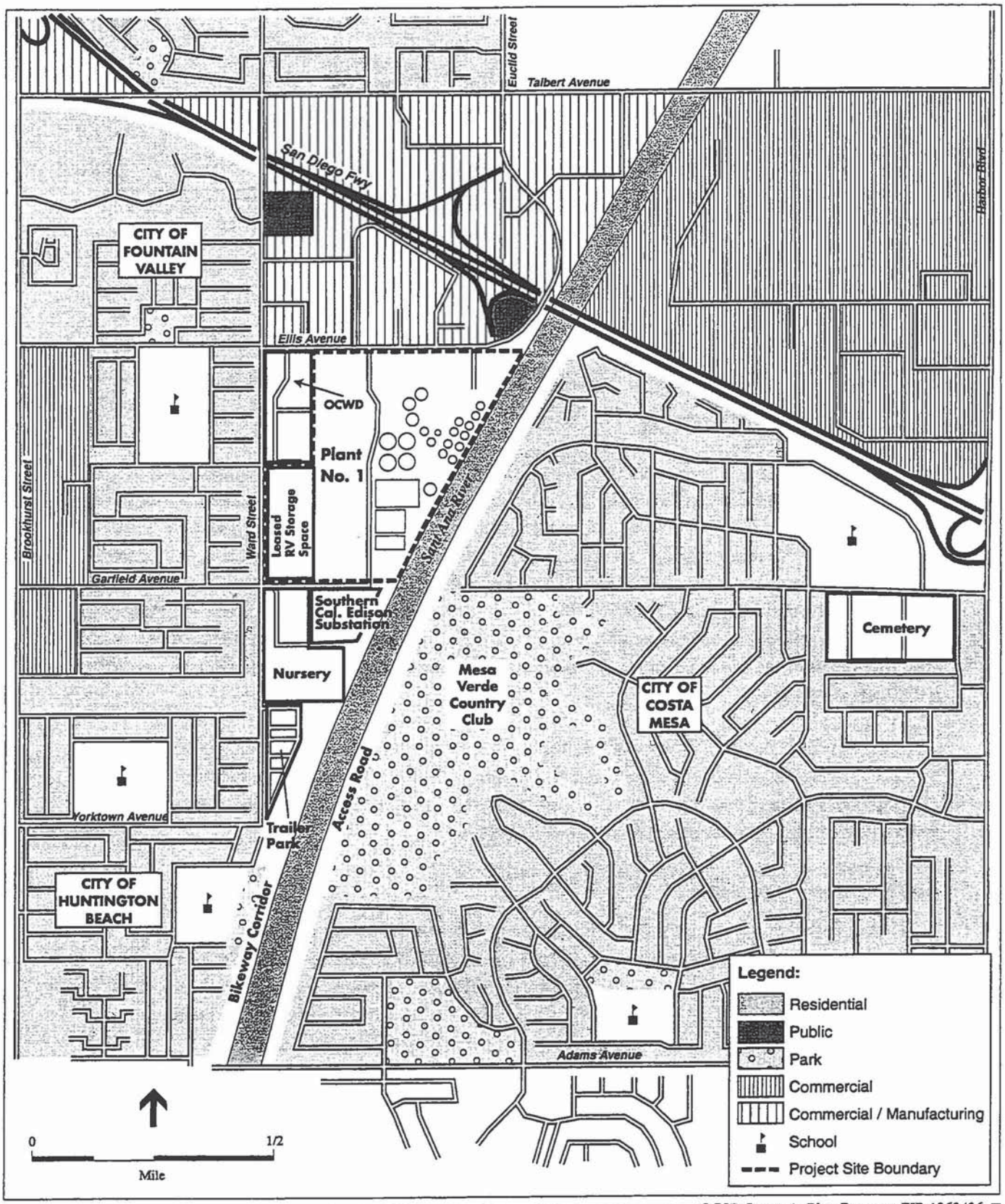
RECLAMATION PLANT NO. 1

Reclamation Plant No. 1 is located in Orange County at the southwest corner of the City of Fountain Valley (see **Figure 3-1**, Chapter 3.0). The cities of Huntington Beach and Costa Mesa lie to the south and east, respectively. The plant site has been developed and continuously used as a wastewater treatment facility for more than 60 years by OCSD. The 108-acre site is bounded by Ellis Avenue on the north and Garfield Avenue on the south (see **Figure 6-1**). The Santa Ana River lies east of Reclamation Plant No. 1 and Ward Street lies to the west. The site is zoned Specific Plan and is located in one of the Fountain Valley's three Specific Plan Areas. The southwestern corner of the plant site is leased to Garfield RV Self Storage, a recreational vehicle (RV) storage business.

Within the plant site, the District's administrative offices are located at the northern end of the plant site along Ellis Avenue, while the treatment facilities cover the eastern portion of the plant adjacent to the Santa Ana River. The western portion of the site, about one-third of the plant property, is currently undeveloped or leased for other uses.

Surrounding Land Uses

Land uses surrounding the plant include residential, industrial, and mixed commercial uses. **Figure 6-1** shows the existing surrounding land uses (see also **Figure 3-6**, Chapter 3.0 for an aerial photograph of the site and vicinity). The OCWD offices and Water Factory 21 treatment facilities are located adjacent to the OCSD plant site in the northwest corner of the block. The properties on the north side of Ellis Avenue and the OCWD property are zoned M1-Manufacturing. Most of the buildings north of Ellis Avenue include low, one-story structures with customer parking and landscaping. The west side of Ward Street is zoned R1- Single Family Residential. This portion of Ward Street west to Brookhurst Street is a residential neighborhood consisting of mostly older single family homes. Mixed use development including commercial and public utility activities that fall within the jurisdiction of the City of Huntington Beach, are located on the south side of Garfield. Residential and recreational uses are located east of the Santa Ana River channel and are under the jurisdiction of the City of Costa Mesa.



SOURCE: OCSD

OCSD Strategic Plan Program EIR / 960436

Figure 6-1
Existing Land Uses Surrounding
Reclamation Plant No. 1

Recreation uses include a bikeway on the elevated Santa Ana River channel embankment. The San Diego Freeway runs perpendicular to the Santa Ana River at the northern end of the site.

Reclamation Plant No. 1 is visually well screened from surrounding uses (OCSD Strategic Plan, 1999, Volume 9 – Urban Design Element). The view of the plant from Ellis Avenue is of a fairly level, attractively landscaped, architectural wall punctuated by prominent trees planted inside the property. The residential properties on the west side of Ward Street have filtered views into the site. Some of the views are buffered by the OCWD property plantings and also blocked by the west wall and plantings of the recreational vehicle storage facility. The current plant expansion activities at the south end of the site are remote from most sensitive receptors; perhaps the only users who notice the activity are transient cyclists, runners, and walkers using the recreation corridor along the Santa Ana River. The RV storage facilities are screened from view by a 15-foot wide planted easement between Ward St. and the storage facilities.

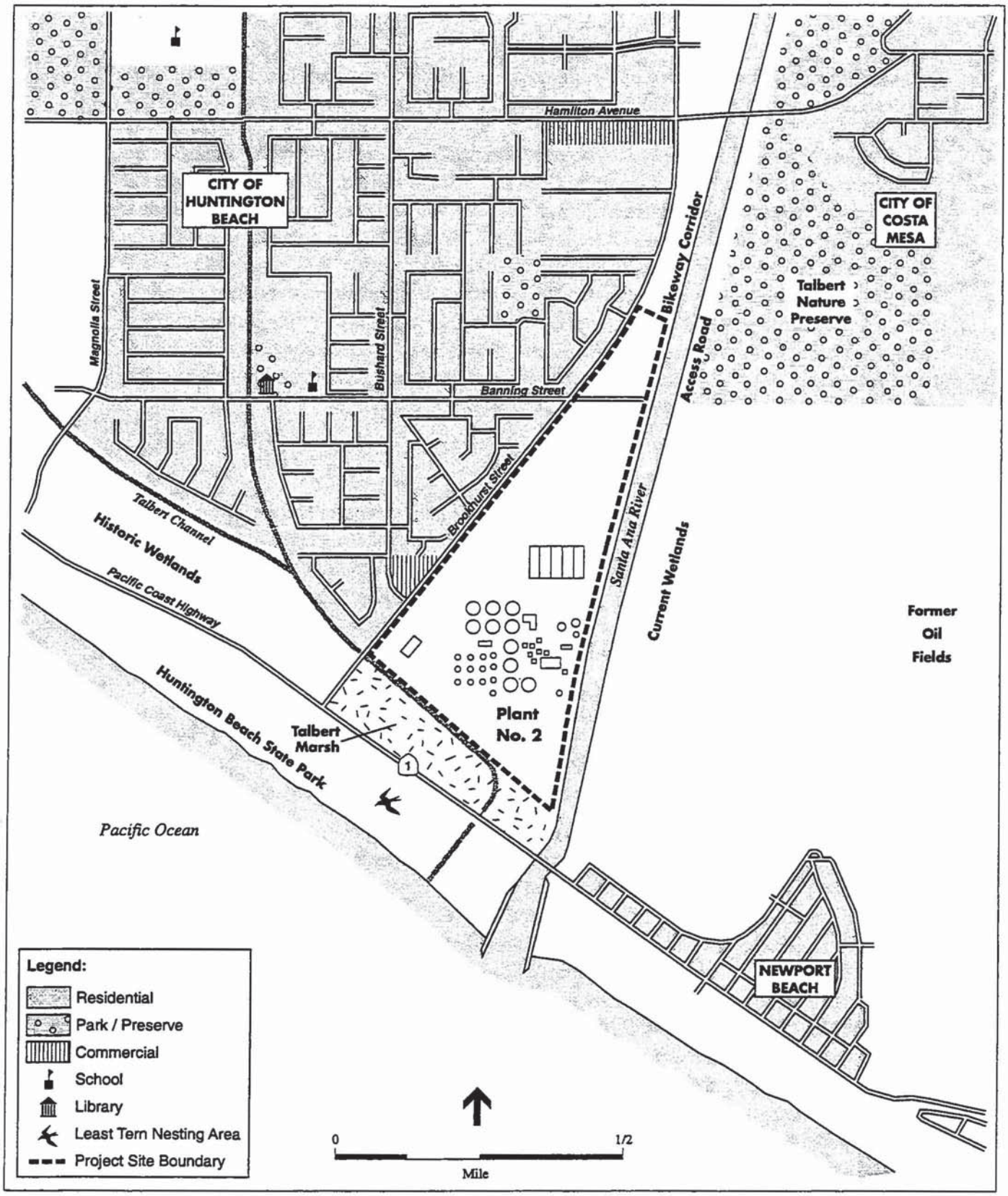
TREATMENT PLANT NO. 2

Treatment Plant No. 2 is located in Orange County at the southern corner of the City of Huntington Beach (**Figure 6-2**). The City of Costa Mesa lies to the southeast across from the Santa Ana River. The 110-acre plant is bounded on the west by Brookhurst Street and on the south by the Orange County flood control channel that was recently restored as Talbert Marsh by the Huntington Beach Wetlands Conservancy and OCSD. Huntington Beach State Park and Pacific Coast Highway are located across the marsh. The site is designated Public and the zoned Industrial.

Within the plant site, existing treatment facilities occupy the southern two-thirds of the site. The area to the northeast remains undeveloped.

Surrounding Land Uses

Figure 6-2 shows Treatment Plant No. 2 and surrounding land uses (see also **Figure 3-9**, Chapter 3.0 for an aerial photograph of the Plant site and vicinity). Treatment Plant No. 2 lies within the southeast industrial area of the City of Huntington Beach. One of the City's three industrial areas, the southeast industrial area also includes the Edison Substation, perhaps the most visible landmark on the City's coastline. Single family homes, enclosed by a masonry wall are situated along the northwest side of Brookhurst Street. A small commercial area is located directly across from Treatment Plant No. 2 on Brookhurst Street. The Santa Ana River Gateway and Pacific Coast Highway are located opposite the southeast corner of the plant. The Talbert Marsh and the Least Tern nesting area are also located south of the plant. A bikeway is located on the east side between the fenced treatment plant site boundary and the Santa Ana River. Across the Santa Ana River are wetland areas. Northeast of the plant lies the Talbert Native Preserve.



SOURCE: OCSD

OCSD Strategic Plan Program EIR / 960436 ■

Figure 6-2
Existing Land Uses Surrounding
Treatment Plant No. 2

OCSD has established landscape planting areas within and surrounding Treatment Plant No. 2 to provide visual screens for sensitive receptors (OCSD Strategic Plan, 1999, Volume 9 – Urban Design Element). The decorative masonry walls and plant materials along Brookhurst Street (visually compatible with the surrounding residential landscapes) screen sensitive receptors from view of the plant. Extensive landscaping has been installed at the plant entrances at Bushard Street and Banning Avenue, and along the facility's entire east boundary adjacent to the Santa Ana River and river bikeway to filter views into the plant. Plans are currently being developed to resolve visual screening issues along the plant's southern boundaries facing the Pacific Coast Highway. The tallest structure at the plant is the Outfall Surge Tower (85 feet).

REGULATORY ENVIRONMENT

City of Fountain Valley

The City of Fountain Valley regulates land at and surrounding OCSD's Reclamation Plant No. 1.

General Plan

The City of Fountain Valley General Plan contains goals, policies and implementation measures that provide planning guidance for the future. The Land Use Element of the City of Fountain Valley General Plan designates land uses within the City. It also includes a discussion of current land uses, development trends and a future land use plan for the City and its Sphere of Influence. Reclamation Plant No. 1 is located in the southwestern portion of the City in an area designated "Specific Plan." Reclamation Plant No. 1 is located within a 100-year floodplain, as is the entire City of Fountain Valley.

Zoning Ordinance

The Zoning Ordinance is the primary implementation mechanism for the Land Use Element of the General Plan. According to the City of Fountain Valley Zoning Ordinance, the site is zoned Specific Plan. Chapter 21 of the Zoning Ordinance establishes Specific Plan overlay zoning districts that are regulated according to adopted specific plans. According to Section 21.12.010 of the Zoning Ordinance, permitted and prohibited uses, site area, floor area ratio, setbacks, building limitations, signage, landscaping, parking and circulation plans and other zoning features are provided by the Specific Plan. Provisions that are not included in the Specific Plan would be subject to the zoning code.

Sanitation District Reclamation Plant No. 1 Specific Plan

The City of Fountain Valley designates Reclamation Plant No. 1 site as a Specific Plan Area. Adopted in 1993, the Sanitation District Plant No. 1 Specific Plan is consistent with the General Plan. It describes existing uses and provides guidance for the continued use and the proposed future development of the site. It provides detailed policies, standards and criteria for the development or redevelopment of the specific area. Additionally, it sets floor area ratios and includes improvements necessary to serve the given intensity of development. The Sanitation District Plant No. 1 Specific Plan includes the following project objectives:

- To continue to meet the needs of the community and region by providing for appropriate facility expansion, new wastewater treatment and reclamation programs and services
- To plan and locate new land uses related to wastewater treatment, to assure compatibility with other existing wastewater treatment facilities on site and surrounding uses and neighborhoods
- To provide for future permitted uses which respond to anticipated needs of the District
- To assure that adequate supporting infrastructure exists to service future needs of the City and of the District
- To implement the goals, objectives and policies of the City of Fountain Valley General Plan
- To implement the goals, objectives and policies of the District "2020" Plan
- To assure that the proposed use will be consistent with the General Plan of the City and the "2020" Plan of the District and that the proposed uses will have a minimal effect on nearby premises or the City as a whole.

The Specific Plan also includes a development plan that describes permitted and prohibited uses and design review provisions for all proposed structures. The design review provisions are summarized below:

- Structures that can be viewed from adjacent streets or properties shall be submitted to the Planning/Building Director for design review. This review includes the review of design features of all exterior elevations of structures, lighting and any signage that can be viewed from adjacent streets.
- Parking (including lighting) and traffic circulation plans shall be subject to design review by the City's Planning/Building and Public Works Directors
- All landscaping plans for areas that can be viewed from adjacent streets or properties shall be subject to design review by the City's Planning/Building and Public Works Directors.
- The District shall provide on-site parking to meet the needs of the employees.
- The District shall submit a hazardous materials plan to the City of Fountain Valley Fire Department for its review and approval.
- The District shall submit an exterior storage plan and method of screening of materials and equipment from arterial streets for review and approval by the Planning/Building Director.

City of Huntington Beach

The City of Huntington Beach regulates land uses on and surrounding OCSD's Treatment Plant No. 2.

General Plan

According to the City of Huntington Beach General Plan, Treatment Plant No. 2 is located in an area designated Public (City of Huntington Beach, 1996). This designation permits governmental administrative and related facilities, such as public utilities, schools, public parking lots, infrastructure and religious uses. The City of Huntington Beach holds an easement to extend Banning Avenue through the northern portion of plant to the Santa Ana River; the easement includes abutments for a bridge to span the Santa Ana River channel. Any future land usage of this area should account for easement and future roadway as well as allow for a buffer zone on both sides of the future roadway.

Zoning Code

Treatment Plant No. 2 is zoned IL-CZ-FP2 (Carvalho, 1999). The IL (Limited Industrial) zoning designation includes moderate to low intensity industrial uses, light manufacturing and commercial uses. Additionally, Treatment Plant No. 2 is located in a (CZ) Coastal Zone Overlay District and in a 100-year flood plain zone (FP-2). The purpose of this Coastal Zone Overlay District is to provide provisions and to identify permitted uses within the City's Coastal Zone that are consistent with the California Coastal Act of 1976 and the General Plan. See Section 6.7, Hydrology for further discussion about floodplain issues.

California Coastal Act

The California Coastal Act established the California Coastal Commission and mandated all county and city coastal jurisdictions to develop Local Coastal Programs (LCP) for the preservation and enhancement of the limited and fragile public resource. The LCP consists of local plans, ordinances and maps that are used to implement the policies of the Coastal Act at the local level The City of Huntington Beach LCP was adopted in 1985. As noted above, the City of Huntington Beach zoning for Treatment Plant No. 2 indicates that the site lies within the Coastal Zone and is subject to provisions consistent with the City's LCP.

6.1.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

The land use analysis evaluates the consistency of the project with the type and intensities of land uses existing and proposed on and near the site. The CEQA *Guidelines* establishes that a project would normally have a significant effect on existing land uses if it would: 1) physically divide an established community; 2) conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance; or 3) conflict with any applicable habitat conservation plan or natural community conservation plan.

The proposed project was evaluated for compatibility with existing and approved land uses near the project site, current zoning and general plan designations for the site, and for consistency with

applicable plans and policies described above. Many potential land use incompatibility issues are the result of other project characteristics, such as the generation of odors, noise, or traffic. Where potential conflicts involving these issues exist, the potential impact is further evaluated in the applicable section, rather than in the land use section.

CONSTRUCTION

Impact 6.1-1. Expansion of the OCSD treatment system, as proposed under Scenarios 2 and 4, would require the construction of additional facilities at Reclamation Plant No. 1 and at Treatment Plant No. 2. Project construction would result in short-term disturbance of adjacent land uses. Less than Significant with Mitigation Measures.

Construction activities associated with the proposed expansion of the treatment system would occur within the existing boundaries of Reclamation Plant No. 1 and Treatment Plant No. 2. Construction activities will involve several general types of activities: demolition and removal of some existing facilities, grading currently unimproved property, excavation and soil removal, and constructing process units. These activities would generate dust, noise, and create traffic impacts; such impacts would be significant for sensitive receptors (e.g. residences) located adjacent to the work zones. For Reclamation Plant No. 1, residential uses are located west of Ward Street. For Treatment Plant No. 2, residential uses are located west of Brookhurst Street and to the north of the plant site. Facility construction would be contained within both plant sites and impacts to sensitive residential receptors would be limited in duration and extent (due to buffering by existing trees and walls). Traffic, noise, and air quality impacts are further discussed in Sections 6.2, 6.4, and 6.5.

As shown in **Figures 3.8** and **3.11** (Chapter 3), Scenario 4 proposes twice the unit process facilities than Scenario 2 for both plants. For Reclamation Plant No. 1, development of the RV Storage area under Scenario 4 would increase land use impacts during construction to sensitive residential receptors located west of Ward Street due to the proximity to residences. For Treatment Plant No. 2, Scenario 4 would increase impacts minimally to sensitive residential receptors on Brookhurst Street due to limited additional facilities.

District-Proposed Mitigation

Measure 6.1-1a: The District will comply with local ordinances and restrict construction activities to daylight hours or as specified in encroachment permits.

EIR-Identified Mitigation

Measure 6.1-1b: The District should provide notices of construction activities to adjacent property owners and provide a contact and phone number of a District staff person to be contacted regarding questions or concerns about construction activity.

Significance after Mitigation

Implementation of the above mitigation measures and those presented in Sections 6.2, 6.4, and 6.5 would ensure that impacts are reduced to a less-than-significant level.

OPERATION

Impact 6.1-2. Expansion and operation of the proposed facilities would not alter the existing land uses at Reclamation Plant No. 1 and Treatment Plant No. 2 and would be compatible with surrounding land uses. Project implementation of either Scenario 2 or Scenario 4 would be compatible with the existing land use on the site and would not conflict with applicable plans and policies. Less than Significant.

As both plant sites are currently used for wastewater treatment, the proposed siting / expansion and operation of additional facilities would be compatible with the existing land use designations. Additionally, the proposed facilities would not conflict with any applicable local plan or policy including general plans, specific plans and zoning ordinances and habitat conservation plans. Proposed improvements at Reclamation Plant No. 1 would be subject to the design review provisions included in Fountain Valley's Sanitation District Plant No.1 Specific Plan. The digesters, the tallest proposed structures, would be approximately 35-40 feet tall. This height would conform with existing structures at Reclamation Plant No. 1 and Treatment Plant No. 2. Improvements to Treatment Plant No. 2, for both Scenarios 2 and 4, would not conflict with the City of Huntington Beach future extension of Banning Street (see **Figure 3-11**). As the proposed siting would not alter the existing land use on-site, impacts are considered less than significant.

Operations of the facilities would generate noise and air quality impacts. New equipment at both plants would generate noise levels above existing ambient levels. Sections 6.4, Noise, addresses the impact and provides a performance standard mitigation to minimize noise impacts. Operations of new facilities would also generate air emissions. These impacts are addressed in Section 6.5, Air Quality. Implementation of the mitigation measures identified in those sections would reduce land use impacts to a less-than-significant level.

Mitigation Measures

No mitigation required.

Impact 6.1-3. Expansion and operation of the proposed facilities for both Scenarios 2 and 4 could adversely alter existing visual character of the site with installation of tall structures and the removal of trees. In additional project implementation could introduce new sources of light and glare. Less than Significant with Mitigation Measures.

The plant sites would be altered visually with the addition of new facilities. As discussed in Impact 6.1-2, above, digesters are the tallest proposed facilities and would measure approximately 35 to 40 feet in height, standing above the perimeter walls. The siting of new facilities could also require the removal of existing trees, further lessening the visual quality of the plant sites. Visual quality impacts are greater for Scenario 4 than Scenario 2 (see **Figures 3-8** and **3-11**) because both of a greater number of digesters and overall treatment facilities proposed. However, implementation of the Urban Design Element of the Strategic Plan would ensure that the views from adjacent uses would be screened to reduce impacts to a less-than-significant level.

OCSD produced Volume 9 of the Strategic Plan, Urban Design Element in 1999. The Element identifies site design issues and goals, offers recommendations to guide OCSD's future activities, and describes the Landscape Master Plans for both treatment plants. The need for an urban design element resulted from two circumstances:

- The first is a response to projected growth of facilities at both treatment plants as demand for services increases and occur in the regulatory environment and OCSD's comprehensive approach to growth and development which includes improvements to the physical plant. In 1989, the OCSD Board of Directors adopted a Collection, Treatment, and Disposal Facilities Master Plan which provided a detailed ten-year building plan, flow and strength projections and a facilities layout plan. All of the facilities built since the adoption of that plan have followed the recommended layout plan. This Strategic Plan updates the facility layout plan. OCSD has an ongoing commitment to the quality appearance of the facility; not only for the community, but also for the staff and visitors.

- The second circumstance is the result of obtaining Variance No. 95-32 to Coastal Development Permit No. 95-39 that was approved by the Huntington Beach City Council on May 20, 1996 to construct a new 86-foot high surge tower at Treatment Plant No. 2. The condition states that, "The County Sanitation Districts of Orange County and the City of Huntington Beach shall work cooperatively in an effort to improve the visual appearance of the plant as viewed from the Pacific Coast Highway." The permit condition further describes three phrases of this effort:

  1. The first phase includes the revision of the landscape plans for the proposed surge tower to include more planting for screening the structure, screening the proposed pump station near Brookhurst Street, and submittal of a plan to study landscaping possibilities along the Pacific Coast Highway side of the facility.

  2. The second phase requires the preparation of a landscape plan that provides for improvements that shield views of Treatment Plant No. 2 from Pacific Coast Highway as effectively as possible, given restrictions imposed by the Department of Fish and Game and constraints resulting from the plant's infrastructure both above and below ground.

  3. The third phase requires that OCSD include an Urban Design Element in the Strategic Plan, which addresses the landscaping and aesthetics of Treatment Plant No. 2.

The Urban Design Element identifies the areas for improvements within both plant sites and guidelines that would enhance the visual quality of the site. Improvements include the following:

- At Reclamation Plant No. 1, the south perimeter needs a landscape treatment to visually screen the facility;

- At Reclamation Plant No. 1, the eucalyptus trees along the Perimeter Road and Santa Ana River bike trail have the eucalyptus longhorn beetle borer, for which there is no effective cure. The trees will eventually die resulting in the loss of valuable screening. A program to manage the infested trees and plant new trees of another species between the existing trees should be instituted as soon as possible to reduce the impact of losing the eucalyptus trees.

- At Treatment Plant No. 2, the view from the Pacific Coast Highway is considered as visually undesirable by the City of Huntington Beach.

- At Treatment Plant No. 2, the bike path view along the Santa Ana River could be improved.

As a result of a future conditions analysis, Landscape Master Plans were developed for both plants. This section of the Urban Design Element identifies recommendations for both plants if Scenario 2 is implemented. Although developed for Scenario 2, the plan addresses the entire plant sites. It identifies recommendations for the design and management of four buffer zones at each site; these zones would serve as visual screens and provide added security. The implementation of the plan recommendations would reduce potential visual impacts to a less-than-significant level.

Exterior security and operations lighting would be installed with new facilities at both treatment plants. This lighting may be evident from adjacent uses, such as residences and the Santa Ana River bikeway. The District will consider the placement and design of outdoor lighting during pre-design for facilities to be constructed closer to the perimeter of the plants.

District-Proposed Mitigation

Measure 6.1-3a: The District will implement the Urban Design Element of the Strategic Plan in order to improve the visual appearance of the site. Recommendations from the Landscape Master Plans (of the Urban Design Element) include the development of buffer zones, planting of trees at the perimeter of the plant along sensitive visual corridors (e.g. Santa Ana bikeway), and maintaining and enhancing the appearance of existing buffer zones.

Measure 6.1-3b: The District will ensure that all permanent exterior lighting is directed downward and oriented to insure that no light source is directly visible from neighboring residential areas. In addition, highly reflective materials and/or finishes shall not be used in the design of proposed structures. In accordance with Measure 6.3-1a, above, landscaping shall be provided to minimize off-site light and glare onto surrounding areas.

Significance After Mitigation: Less than Significant.

REFERENCES – LAND USE

Environmental Science Associates, Site Surveys on March 23, and March 29, 1999.

Fountain Valley, City of, 1993. *The Sanitation District Plant No. 1 Specific Plan.* 1993.

Fountain Valley, City of, 1995. *City of Fountain Valley General Plan.* 1993.

Fountain Valley, City of, 1993. *City of Fountain Valley Zoning Ordinance.* 1993.

Huntington Beach, City of, 1996. *City of Huntington Beach General Plan.* 1996

Carvalho, Wayne. City of Huntington Beach Planning Department, Telephone communication, April 12, 1999.

Gallardo, Maria. City of Fountain Valley Planning Department, Telephone communication, April 21, 1999.

6.2 TRAFFIC

6.2.1 SETTING

Construction-related traffic and transportation impacts can be evaluated by assessing the increase in traffic resulting from a project and then evaluating the impact of the additional traffic on area roadways.

RECLAMATION PLANT NO. 1

Reclamation Plant No. 1 is bordered by Ellis Avenue on the north, Garfield Avenue to the south, and Ward Street on the west (see **Figure 3-6**). **Ellis Avenue** is a four-lane east-west arterial that extends from Beach Boulevard in Huntington Beach to Euclid Street at I-405 in Fountain Valley. It is signalized at major intersections, including **Ward Street** and the I-405 southbound on- and off-ramps. Average daily traffic (ADT)[1] on Ellis Avenue is 28,000 *(Source: 1996 OCTA Traffic Flow Map).* Truck traffic is not permitted on either Ellis Avenue or Ward Street.

Access to Reclamation Plant No. 1 is via a main two-lane gate on Ellis Avenue, immediately west of the I-405 ramps. An additional service entrance is located along Ellis Avenue west of the main entrance. **Garfield Avenue** is also a four-lane, east-west street. It extends from Edwards Street in Huntington Beach to the Santa Ana River at Reclamation Plant No. 1 in Fountain Valley. Garfield Avenue carries an ADT of 9,000 just west of Ward Street *(Source: 1996 OCTA Traffic Flow Map).*

Ward Street is a four-lane roadway that forms the western boundary of Reclamation Plant No. 1. Ward Street carries an ADT of 14,000 just south of the project site *(Source: 1996 OCTA Traffic Flow Map).*

I-405 is a grade-separated 10-lane freeway in the vicinity of Reclamation Plant No. 1. High-occupancy vehicle lanes are presently under construction. At the Euclid Street interchange, ADT's range from 262,000 to 291,000 (Source: *Caltrans 1997 Traffic Volumes*).

TREATMENT PLANT NO. 2

Treatment Plant No. 2 is bordered by **Brookhurst Street** and Hamilton Avenue, and is close to SR 1 (see **Figure 3-9**). Brookhurst Street is a major six-lane, north-south arterial with a median that extends from SR-1 in Huntington Beach to Fullerton in northern Orange County. Brookhurst Street carries an ADT of between 15,000 and 22,000 adjacent to the plant site (Source: *1996 OCTA Traffic Flow Map*).

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[1] ADT represents the total number of vehicles that pass a segment of roadway in one day

Hamilton Avenue is a major four-lane, east-west oriented arterial from Newland Street to the Santa Ana River in Huntington Beach. Hamilton Avenue carries an ADT of 15,000 adjacent to the plant site (Source: *1996 OCTA Traffic Flow Map*).

SR-1 is a four-lane regional highway that runs along the western coast of the state. Near Treatment Plant No. 2, SR-1 carries an ADT of 43,500 (Source: *Caltrans 1997 Traffic Volumes*).

Access to Treatment Plant No. 2 is provided by a main entrance on Brookhurst Street, between Banning Avenue and Bushard Street. Two service entrances are located north and south of the main entrance. The City of Huntington Beach and Orange County possess an easement across the District's property as a possible extension of Banning Street across the Santa Ana River (see **Figure 6-2**.

EXISTING OPERATIONS-RELATED TRAFFIC

Existing traffic entering both treatment plants consists of chemical delivery trucks; screenings, grit and biosolid removal trucks; and the vehicles of employees, construction workers, and visitors.

In the year 2000, it is estimated that chemical deliveries will account for 76 one-way trips per month for Reclamation Plant No. 1 and 98 one-way trips per month for Treatment Plant No. 2 under Scenario 2. Using average round trip distance for each chemical by source location, projected year 2000 average vehicle miles traveled (VMT) from chemical delivery trucks equal 19,158 miles for Reclamation Plant No. 1 and 27,869 miles for Treatment Plant No. 2.

Under existing conditions, there are 515 current employees at Sanitation District facilities. Assuming an average auto occupancy rate of 1.15 and two trips per employee, there are about 900 employee-related trips per day. These daily employee trips total about 11,200 VMT per day, using a worst case average of 25 miles traveled per day per employee, including lunch and incidental trips.

Solids that need to be removed from the Sanitation District Facilities include grit and screenings and biosolids. Grit and screenings are solids derived from the preliminary treatment process in the barscreens and grit chambers. Biosolids are produced as a byproduct of wastewater treatment.

Grit and screening material is disposed of in appropriate landfills. In 1997, a total of 1,800 wet tons were disposed of in Chiquita Canyon Landfill in Valencia (Los Angeles County), and the remainder, 4,800 wet tons, were disposed of in the Prima Deshecha Landfill in southeastern Orange County as well as in the Simi Valley Landfill. The Chiquita Canyon Landfill is located approximately 70 miles from the plant sites, the Prima Deshecha Landfill is located approximately 20 miles and the Simi Valley Landfill is located approximately 50 miles from the plant sites.

Grit and screening material transport is estimated to require 42 truck trips per year for Reclamation Plant No. 1 and 57 trips per year to Treatment Plant No. 2. Assuming an equal

distribution to each site and using two-way trip rates for trucks, Plant No. 1 will generate 3,854 VMT per year and Treatment Plant No. 2 will generate 5,264 VMT per year.

Biosolid material is disposed of locations allowing the use of biosolids for beneficial uses such as non-food crop agriculture. Biosolids are currently hauled by contractors to sites located within Kern, King Riverside and San Diego Counties. One way distances range from approximately 250 miles to a King County, 170 to 200 miles to Kern County sites, 110 miles to a San Diego County site and 70 miles to a Riverside County site (See **Figure 3-16**).

Biosolid materials are transported to areas that accept shipments. Land areas accepting biosolid materials vary depending on time of year, local ordinances and availability. To make a conservative estimate of required truck miles traveled in order to transport biosolid material, it was assumed that the Kern County sites, a distance of approximately 200 miles from the OCSD plants was used as a basis for traffic impact calculations. In the year 1997, Reclamation Plant No. 1 generated 3,300 truck trips per year to transport biosolid materials. Plant No. 2 generated 5,700 truck trips per year. Assuming two-way trips at 400 miles per trip, Reclamation Plant No. 1 generates 1.32 Million VMT per year and Treatment Plant No. 2 generates 2.28 Million VMT per year.

6.2.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

The CEQA Guidelines find impacts to traffic to be significant if the project were to cause any of the following conditions:

- Cause an increase in traffic which is substantial in relation to existing traffic load and capacity of the street system
- Exceed a level of service standard established by the county congestion management agency for designated roads or highways
- Substantially increase hazards due to design feature (e.g., sharp curves) or incompatible use (e.g., farm equipment)
- Result in inadequate emergency access
- Result in inadequate parking capacity
- conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

Impact 6.2-1: Periods of peak construction will increase traffic along local access streets. Less than Significant with Mitigation Measures.

The treatment facility expansion proposed in the 1999 Strategic Plan will occur in phases over the next 20 years. Construction activity will involve the following general types of activities: demolition and removal of some existing facilities, grading currently unimproved property,

excavation and soil removal, and construction process units. These activities are generally consistent through Scenarios 1 through 6. In general, the construction will occur in periodic activity peaks, requiring brief periods of significant effort followed by reduced activities.

No detours, lane closures, or road closures are anticipated as a result of the onsite construction activities. Substantial amounts of truck traffic, however, would be generated during peak construction periods.

Construction crews may range from 100 to 500 workers depending on the construction schedule and the work being performed. This would result in approximately 150 to 750 worker-related trips per day at all of the facilities (assuming a constant rate of construction, a 1.3 vehicle occupancy rate, and only two trips per day per worker). Direct employment generated by the construction activity would result in an estimated 1,900 to 9,600 vehicle miles traveled per day assuming a conservative 25 miles per trip.

Construction work is on going at the two plants. Construction work is a continuation of current plans and should not result in significant impacts to adjacent roadways. Officials of the City of Fountain Valley and the District have discussed traffic routing issues in the past and will continue to do so as specific projects are implemented.

EIR-Identified Mitigation

> **Measure 6.2-1:** For each major project or construction period, the Districts would complete a detailed construction schedule and notify the Cities of Fountain Valley and Huntington Beach of it. Construction vehicles should be run on a schedule to minimize travel on the regional transportation facilities during peak traffic periods.

Significance after Mitigation: Less than Significant.

Impact 6.2-2: Additional traffic would be generated from the ongoing operations of the facilities at Reclamation Plant No. 1 and Treatment Plant No. 2. Sources of new traffic include chemical truck deliveries, trips by new District's employees, and increased biosolids hauling truck trips. Less than Significant with Mitigation Measures.

Table 6.2-1 shows projected future vehicle trips under Scenarios 2 and 4 compared to 2000 levels. Chemical deliveries by 2020 are estimated to increase to 135 trips per month at Reclamation Plant No. 1 and 135 trips per month at Treatment Plant No. 2 for Scenario 2. Chemical truck monthly deliveries by 2020 lead to VMT of approximately 31,200 for Reclamation Plant No. 1 and 30,300 VMT for Treatment Plant No. 2.

The amount of monthly chemical truck trips increases as levels of secondary treatment increase. Chemical deliveries by 2020 under Scenario 4 are estimated to increase to 177 trips per month at Reclamation Plant No. 1 and 174 trips per month at Treatment Plant No. 2. Chemical monthly

deliveries by 2020 lead to VMT of approximately 40,906 for Reclamation Plant No.1 and 39,053 VMT for Treatment Plant No. 2.

Total Districts employment will increase from the existing 515 employees to 540 employees by 2020. By 2020, assuming an average auto occupancy rate of 1.23, there would be 878 total trips per day from Districts' employees. Assuming an average round-trip distance of 25 miles per driving employee, employee-related daily VMT would be 20,975.

TABLE 6.2-1
VEHICLES MILES TRAVELED PER DAY

	Chemical Deliveries	Employee Trip	Biosolids Hauling	Grit and Screenings	Total
2000					
P1	639	5,600	3,616	11	9,866
P2	929	5,600	6,247	14	12,790
Total	1,568	11,200	9,863	25	22,656
2020 – Scenario 2					
P1	1,040	10,487	7,014	14	18,555
P2	1,040	10,488	7,978	19	19,525
Total	2,080	20,975	14,992	33	38,080
2020 – Scenario 4					
P1	1,363	10,487	8,986	14	20,850
P2	1,300	10,488	9,468	19	21,275
Total	2,663	20,975	18,455	33	42,126

NA = data not available

In the Year 2020, grit and screening material transport is estimated to require 54 truck trips per year to Reclamation Plant No. 1 and 74 trips per year to Treatment Plant No. 2. Assuming an equal distribution to each site and using two-way trip rates for trucks, Reclamation Plant No. 1 will generate 5,076 VMT per year and Treatment Plant No. 2 will generate 6,956 VMT per year.

To make a conservative estimate of required truck miles traveled in order to transport biosolid material in the year 2020, the distance to the Kern County sites of approximately 200 miles from the OCSD plants was used as a basis for traffic impact calculations. A similar assumption was used to document existing truck traffic. For Scenario 2 in the year 2020, it is estimated that Reclamation Plant No. 1 would generate 6,550 truck trips per year (18 per day) and Treatment Plant No. 2 would generate 9,600 truck trips per year (27 per day). Assuming two-way trips at 400 miles per trip, Reclamation Plant No. 1 would generate 2.6 Million VMT per year and Treatment Plant No. 2 will generate 3.8 Million VMT per year. For Scenario 4 in the year 2020, it is estimated that Reclamation Plant No. 1 will generated 10,250 truck trips per year (28 per day) to transport biosolid materials and Treatment Plant No. 2 would generated 10,800 truck trips

per year (29 per day). Assuming two-way trips at 400 miles per trip, Reclamation Plant No. 1 would generate 4.10 Million VMT per year and Treatment Plant No. 2 will generate 4.32 Million VMT per year. Currently, approximately 13 biosolids trucks per day leave Treatment Plant No. 2 and drive 5 miles north on Brookhurst Avenue to I-405. For treatment Scenario 4, this number will increase to 29 trucks per day.

The additional traffic from chemical delivery trucks, screenings and grit disposal trucks, biosolid disposal trucks, and employee trips would be considered a small percentage of the adjacent street traffic levels and a less-than-significant impact.

District-Proposed Mitigation

Measure 6.2-2a: The Districts will continue the existing ride-sharing program to encourage employees to join a carpool and use transit.

Measure 6.2-2b: Chemical delivery trucks and screenings and grit and biosolids disposal trucks will avoid operating during peak traffic hours when possible.

Significance after Mitigation: Less than Significant.

Impact 6.2-3: Increased biosolids and chemical truck trips would impact regional transportation systems including freeways, especially I-405 and I-5. Less than Significant with Mitigation Measures.

Truck traffic will haul grits and screenings and biosolid materials over freeways within the regional network. Trucks traffic traveling to disposal sites in Simi Valley, Chiquita Canyon as well as Kings and Kern Counties will utilize I-405 and I-5 when traveling north through Orange and Los Angeles Counties. Trucks destined for landfills and disposal sites to the east and south will utilize the freeway system in Orange and San Diego Counties. In all cases, trucks must utilize designated truck routes.

All these major arterial and freeway routes experience a degree of peak hour congestion. The additional truck traffic generated by the project would result in additional traffic volumes and would incrementally increase congestion, particularly during peak travel periods. The truck and vehicular traffic generated by the project would not result in significant, direct traffic impacts. The project would contribute to the significant cumulative traffic congestion impact in the county and Southern California region.

EIR-Identified Mitigation

Measure 6.2-3: The District should arrange for the transport of biosolids by trucks during off-peak travel hours when possible to reduce truck travel times and minimize impacts to the regional transportation system.

Significance after Mitigation: Less than Significant.

REFERENCES – TRAFFIC

Caltrans, *Traffic Volumes*, 1997.

Orange County Traffic Authority (OCTA) Traffic Flow Map, 1996.

OCSD, *Strategic Plan, Volume 8,* 1999.

Anderson, Angie, OCSD engineering, personal communication, 10 April 1999.

6.3 BIOLOGICAL RESOURCES

6.3.1 SETTING

RECLAMATION PLANT NO. 1

Reclamation Plant No. 1 is located in a developed area of Fountain Valley. The Santa Ana River acts as the eastern boundary of the property. Nearby open spaces include the Mesa Verde Country Club Golf Course and the Talbert Nature Reserve both located on the eastern side of the river in Costa Mesa, southeast of Reclamation Plant No. 1. **Figure 3-6** in Chapter 3.0, Project Description, shows an aerial photograph of the plant site. **Figure 6-1** in Section 6.1, Land Use shows lands uses adjacent to the plant. The full extent of the District's property at Plant No. 1 has been previously disturbed or landscaped. Areas not occupied by buildings have historically been used as biosolids drying beds. The Santa Ana River channel has been improved in the area of Reclamation Plant No. 1 as part of on-going flood control efforts by the Orange County Flood Control District as well as the Army Corps of Engineers. The river berms are routinely landscaped or cleared of vegetation. A bike path is maintained on the western bank of the river. The river bed is lined with concrete. As a result of the urban development in the region, no undisturbed native flora or fauna exist on or in the immediate vicinity of Reclamation Plant No. 1.

The Santa Ana River is concrete-lined for approximately five miles from Reclamation Plant No. 1 north to the River View Golf Course in Santa Ana. From the River View Golf Course north, the river has a natural bed with concrete sides. The concrete-lined river has no habitat value for native species. During summer low flow season, some soil may accumulate in small scattered patches on the concrete. However, channel maintenance and winter floods regularly scour this accumulation away. This soil accumulation may support invasive plant species temporarily, but is not permanent enough to develop habitat useful to native wildlife. The only exception to this is the presence of a few emergent riparian species including cattails and rushes that have grown in isolated patches at the margins of the maintained channel bottom in areas where maintenance equipment has difficulty reaching. A few small arroyo willow saplings have become established in similar situations. (OCWD, GWRS EIR, 1998)

The District has landscaped much of the perimeter of the property along Ward Avenue. Trees and grass line the edge of the property within the sound wall. Other landscaping exists near the administration buildings.

The California Department of Fish and Game Natural Diversity Database indicates that no special-status species have been identified within the Plant No. 1 property boundaries or on contiguous properties.

TREATMENT PLANT NO. 2

Treatment Plant No. 2 is situated at the mouth of the Santa Ana River on the Pacific Ocean. (See **Figure 3-9**, Chapter 3.0, Project Description, for an aerial photograph of the site and **Figure 6-2**, Section 6.1, Land Use for land uses adjacent to Plant No. 2.) The Pacific Coast Highway and the 40-foot wide Talbert Marsh area separates the District's property from the beach. The area to the north of the property is completely developed, constituting the City of Huntington Beach. The whole plant site area within the District's property boundaries has been previously disturbed or landscaped. No undeveloped or native habitats exist within the property boundaries.

The Santa Ana River acts as the eastern boundary of the facility. The river in this area has been lined with rock and rip-rap by the Orange County Flood Control District and the Army Corps of Engineers. The river channel is wider here than it is further north at Reclamation Plant No. 1, and is influenced by tidal flows, creating an estuary environment. As with the river channel to the north, the river berms are landscaped and cleared of vegetation. A bike path is maintained on the western river bank. The river in this segment is host to water fowl, but few wading birds or shoreline habitats exist due to the rip-rap sides and flood control maintenance activities.

The Talbert Marsh was recently established by the Huntington Beach Wetlands Conservancy on property lying between the southern portion of the District's property and the Pacific Coast Highway. This sensitive habitat area could provide essential habitat for special-status species in the future. In addition, wetlands are being developed by the U.S. Fish and Wildlife Service directly across the Santa Ana River from Treatment Plant No. 2 to the east (see **Figure 3-9**, Chapter 3.0, Project Description). Other wetlands in the area include the Bolsa Chica Ecological Reserve approximately six miles north up the coast and the Upper Newport Bay Ecological Reserve approximately four miles east of the Santa Ana River. In addition, a Least Tern nesting area has been established on a portion of Huntington Beach just west of the Pacific Coast Highway (see **Figure 4-1**). Talbert Regional Park has recently been established on the east side of the Santa Ana River approximately one-half mile northeast of Treatment Plant No. 2.

Some landscaping including grass and trees exists on the Plant No. 2 property, primarily along the perimeter of the site on Brookhurst Avenue behind the sound wall. Nine 30-foot-tall palm trees are growing just south of the activated sludge facility.

The California Department of Fish and Game Natural Diversity Database indicates that no special-status species have been identified within Treatment Plant No. 2 property boundaries. However, in addition to California Least Tern nesting habitat across the Pacific Coast Highway, special status species have been identified in areas to the southwest of Treatment Plant No.2 including: Beldings Savannah Sparrow (a federal species of concern, State listed as endangered) and the Western Snowy Plover (federally listed as threatened, not State listed).

6.3.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

The CEQA Guidelines states that a project would be considered to have significant effects if it were to:

- Have a substantial effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.

- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.

- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including but not limited to marsh, vernal pool. coastal, etc.) through direct removal, filling, hydrological interruption or other means.

- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

- Conflict with the provisions of a adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

CONSTRUCTION AND OPERATION

At this time, no special-status species have been identified on either plant site. Construction and operation activities in general would not impact biological resources. No impacts to biological resources would result from on-site operations or construction within the boundaries of either plant since the areas have already been disturbed by current and historic treatment plant process activities, and no natural undisturbed habitats exist on District property.

Installation of a new 120-inch diameter outfall pipeline would require additional biological studies to assess impacts to the beach and marine environment. Future projects potentially disturbing wetland areas or other sensitive habitats would require additional biological studies.

Mitigation Measures

No mitigation measures are required.

REFERENCES – BIOLOGICAL RESOURCES

OCSD, 1989 Master Plan EIR, 1989.

CDFG, CNDDB database, 1999.

6.4 NOISE

6.4.1 SETTING

Section 4.6, in Chapter 4.0, Regional Setting, provides a discussion of noise descriptors and principles and examples of some representative noise sources.

SENSITIVE RECEPTORS AND EXISTING NOISE ENVIRONMENT

Some land uses are considered more sensitive to ambient noise levels than others are, due to the amount of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities typically involved. Residential areas, schools, and hospitals generally are more sensitive to noise than are commercial and industrial land uses. A brief discussion of sensitive receptors and the existing noise environment surrounding the Orange County Sanitation District's (OCSD) Reclamation Plant No. 1 in Fountain Valley and Treatment Plant No. 2 in Huntington Beach is provided below.

In general, the primary noise-generating sources at the treatment facilities include engine/motor noise, mechanical equipment (including large fans and trunkline scrubbers), paging systems, and truck traffic entering and leaving the plants.

RECLAMATION PLANT NO. 1

The primary source of noise in the City of Fountain Valley is vehicle traffic on Interstate 405 (I-405), major arterials, and collector streets. OCSD's Reclamation Plant No. 1 is bordered by Ellis Avenue to the north, Garfield Avenue to the south, Ward Street to the west and the Santa Ana River to the east (see **Figure 6-1**, in Section 6.1, Land Use). The City's General Plan Noise Element identifies traffic on each of these roadways as a source of noise. Noise contour maps from the Noise Element show that existing and future noise levels at the treatment facility range from between 60 to 70 CNEL. Residences adjacent to the plant experience noise levels of about 60 to 65 CNEL (City of Fountain Valley, 1995). Land uses surrounding Reclamation Plant No. 1 include residential areas to the west and east, and intermixed public utility and commercial uses on the south. Single-family residences abutting Ward Street are within 85 feet from the western boundary of the treatment facility.

A chain link fence surrounds Reclamation Plant No. 1 to the south, east and west. A 4-foot decorative block/masonry wall and a line of trees border the site to the north along Ellis Avenue.

TREATMENT PLANT NO. 2

The primary source of noise in the City of Huntington Beach is vehicle traffic on local roadways. Other major noise sources include aircraft overflights, railroad operations, and petroleum extraction activities. Treatment Plant No. 2, being triangular in shape, is bordered by the Santa Ana River to the east, the Talbert Channel to the south, and Brookhurst Street to the west. State Route 1 (SR 1) is located roughly 550 feet south of the treatment facility. Traffic on SR 1 and

Brookhurst Street are the primary sources of noise in the plant vicinity. Noise contour maps from the City's General Plan Noise Element show that existing and future noise levels on the plant site are roughly 60 Ldn. Residences adjacent to the plant experience noise levels of about 60 to 65 Ldn (City of Huntington Beach, 1995). Land uses surrounding Treatment Plant No. 2 include residential areas to the west and wetlands to the south and east. Single-family residences west of the plant (across Brookhurst Street) are as close as 100 feet or more from the western boundary of the site.

In efforts to reduce exposure of nearby residents to treatment plant noise, OCSD has installed muffler systems on some engines and/or enclosed structures (County Sanitation Districts of Orange County, 1989). In addition, a 10- to 12-foot brick wall separates residences along Brookhurst Street, west of the treatment facility, from operations at Treatment Plant No. 2. A chain link fence surrounds the remainder of the site.

REGULATORY ENVIRONMENT

In most areas, automobile and truck traffic is the major source of environmental noise. Traffic activity generally produces an average sound level that remains fairly constant with time. Air and rail traffic, and commercial and industrial activities are also major sources of noise in some areas.

Federal, state, and local agencies regulate different aspects of environmental noise. Federal and state agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources is left to local agencies. Local regulation of noise involves implementation of General Plan policies and Noise Ordinance standards. Local General Plans identify general principles intended to guide and influence development plans, and Noise Ordinances set for the specific standards and procedures for addressing particular noise sources and activities.

General Plans recognize that different types of land uses have different sensitivities toward their noise environment; residential areas are generally considered to be the most sensitive type of land use to noise and industrial/commercial areas are generally considered to be the least sensitive. Local noise ordinances typically set forth standards related to construction activities, nuisance-type noise sources, and industrial property-line noise levels. For this project, City of Fountain Valley noise regulations and standards apply to Reclamation Plant No.1, while the City of Huntington Beach noise regulations and standards apply to Treatment Plant No. 2. Applicable regulations, standards and policies are summarized below.

City of Fountain Valley

The City of Fountain Valley's noise compatibility guidelines for various land uses are contained in the Noise Element of the General Plan (City of Fountain Valley, 1995). For residential land uses, the normally acceptable interior and exterior noise standards are 45 and 60 CNEL, respectively. Based on the extent of noise/land use incompatibilities that already exist throughout the Huntington Beach, the Noise Element identifies the need to incorporate noise concerns in future land use planning. Some of the City policies designed to reduce noise impacts from traffic

noise sources relate to the design of street circulation, coordination of routing, installation of noise barriers along major roadways, and the advocating of noise control requirements for all new motor vehicles. Non-transportation noise sources, including noise from construction activities, are controlled through the application and enforcement of the City's Noise Ordinance.

The Fountain Valley Noise Ordinance establishes noise limits that cannot be exceeded at the property line of residences. (Note that these noise standards are more restrictive than those described above from the General Plan Noise Element.) For residential properties, the exterior noise standards are 55 dBA between 7:00 a.m. and 10:00 p.m., and 50 dBA between 10:00 p.m. and 7:00 a.m., with interior noise standards of 55 dBA between 7:00 a.m. and 10:00 p.m. and 45 dBA between 10:00 p.m. and 7:00 a.m. Noise associated with construction is excluded from these noise standards, provided the construction activities occur between the hours of 7:00 a.m. and 8:00 p.m. on weekdays (including Saturday). Construction activities are not allowed on Sundays or legal holidays (City of Fountain Valley, 1976).

City of Huntington Beach

The Noise Element of the General Plan acknowledges that there are a number of residential, commercial, and industrial land uses in the City of Huntington Beach, particularly along arterial roadways, impacted by vehicular noise levels that exceed City noise/land use compatibility standards (City of Huntington Beach, 1995). For residential land uses, the normally acceptable interior and exterior noise standards are 45 and 60 Ldn, respectively.

Relevant noise policies from the Noise Element include:

> Policy N 1.2.2 – Require new industrial and commercial land uses or the major expansion of existing land uses to demonstrate that the new or expanded use would not be directly responsible for causing exterior noise levels to exceed 65 Ldn in areas containing noise sensitive land uses.
>
> Policy N 1.2.5 – Require development that generates increased traffic and subsequent increases in ambient noise levels adjacent to noise sensitive land uses to provide for appropriate mitigation measures in accordance with acceptable limits of the City's Noise Ordinance.
>
> Policy N 1.6.1 – Ensure that construction activities be regulated to establish hours of operation, to prevent and/or mitigate the generation of excessive or adverse noise impacts through implementation of the City's Noise Ordinance.
>
> Policy N 1.12.1 – Require detailed and independent acoustical studies be completed for any new or renovated land uses or structures determined to be potential major stationary noise sources.
>
> Policy N 1.12.2 – Encourage major stationary noise generating sources to install additional noise buffering or reduction mechanisms within their facilities to reduce noise generation levels to the lowest extent practicable prior to the renewal of Conditional Use Permits of business licenses or prior to the approval and/or issuance of new Conditional Use Permits.

The City's Noise Ordinance establishes noise limits that cannot be exceeded at the property line of residences. These noise standards are more restrictive than those described above in the Noise Element. For residential properties, the exterior noise standards are 55 dBA between 7:00 a.m. and 10:00 p.m., and 50 dBA between 10:00 p.m. and 7:00 a.m., with interior noise standards at 55 dBA between 7:00 a.m. and 10:00 p.m. and 45 dBA between 10:00 p.m. and 7:00 a.m. Noise associated with construction is excluded from these noise standards, provided the construction activities occur between the hours of 7:00 a.m. and 8:00 p.m. on weekdays (including Saturday). Construction activities are not allowed on Sundays or legal holidays (City of Huntington Beach, 1993).

City of Costa Mesa

The City of Costa Mesa also has promulgated a noise ordinance. Since residual solids trucks sometimes cross through Costa Mesa, the ordinance is included in this section. The Costa Mesa Noise Ordinance establishes noise limits for residential property. The exterior noise standards are 55 dBA between 7:00 a.m. and 11:00 p.m., and 50 dBA between 11:00 p.m. and 7:00 a.m., with interior noise standards of 55 dBA between 7:00 a.m. and 11:00 p.m. and 45 dBA between 11:00 p.m. and 7:00 a.m. Noise associated with construction is excluded from these noise standards, provided the construction activities occur between the hours of 7:00 a.m. and 8:00 p.m..

6.4.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

Appendix G of the revised *CEQA Guidelines* (Governor's Office of Planning and Research, 1998) indicates that a project could be significant if it would:

- expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- expose persons to or generate excessive groundborne vibration or groundborne noise levels;
- result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
- for a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels; or
- for a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise.

A change in noise levels of less than three dBA is not discernible to the general population, while an increase in average noise levels of three to five dBA is clearly discernible to most people (California Department of Transportation, 1991). An increase in the noise environment of

five dBA or greater is considered to be the minimum required increase for a change in community reaction (U.S. Department of Transportation, 1990) and, for the purposes of this analysis, constitutes a significant noise impact. With temporary construction noise impacts, identification of "substantial increases" depends upon the duration of the impact, the temporal daily nature of the impact, as well as the absolute change in dBA levels.

For operational impacts, operational noise that would exceed the "normally acceptable" land use compatibility noise range of the general plan in the jurisdiction where a project element is proposed would be considered a significant noise impact. If a land use already exists in a "conditionally acceptable" or "normally unacceptable" noise compatibility environment, as designated in the General Plan, then an increase in operational noise that would result in a change of land use compatibility category would be considered a significant noise impact. For land uses designated as within a "clearly unacceptable" noise compatibility environment, operational noise that would result in a three dBA or greater increase to the existing noise environment would be considered significant, if sensitive receptors that would be affected are present. If sensitive receptors would not be present but the land use is considered sensitive to noise, then a five dBA increase would be considered significant. Otherwise, an increase would only be considered significant if it violated a local noise ordinance or substantially contributed to an existing violation of a noise ordinance.

CONSTRUCTION

Impact 6.4-1: Construction activities related to the proposed treatment plant improvements at Reclamation Plant No. 1 and Treatment Plant No. 2 would intermittently and temporarily generate noise levels above existing ambient levels in the project vicinity. Significant and Unavoidable.

Construction-related noise levels at Reclamation Plant No. 1 and Treatment Plant No. 2 would fluctuate depending on the particular type, number, and duration of use of various pieces of construction equipment. The effect of construction noise would depend upon the amount of noise generated by the equipment, the distance between construction activities and the nearest noise-sensitive uses, and the existing noise levels at those sensitive uses.

The amount of construction that would occur at Reclamation Plant No. 1 and Treatment Plant No. 2 would vary by treatment scenario. The variations in the actual number of new pieces of equipment that would need to be installed under each treatment scenario at Reclamation Plant No. 1 and Treatment Plant No. 2 are shown in **Tables 3-2** and **3-3** in Chapter 3.0, respectively. The corresponding locations of the proposed equipment are shown on **Figures 3-8 and 3-11**. In general, Scenario 4 would require the maximum amount of construction, while Scenario 2 would require the least amount of construction. Impacts from construction of the other treatment scenarios would fall somewhere between these two.

For Reclamation Plant No. 1, the majority of the proposed new structures would be concentrated in the southwest portion of the site. Under each of the treatment scenarios, residences west of the plant across Ward Street would be within 150 feet or more from proposed construction activities.

Other construction activities would occur at a greater distance from residences. As described earlier in this section, residences adjacent to Reclamation Plant No. 1 experience noise levels of 60 to 65 CNEL (City of Fountain Valley, 1995).

For Treatment Plant No. 2, the majority of the proposed new structures would be concentrated in the northern portion of the treatment facility. Residences west of the plant across Brookhurst Street are as close as 450 and 150 feet from proposed construction activities under Scenarios 2 and 4, respectively. Other construction activities would be at a greater distance from residences. As described earlier in this section, residences adjacent to the treatment facility experience noise levels of 60 to 65 Ldn (City of Huntington Beach, 1995).

Installation of proposed equipment at Reclamation Plant No. 1 and Treatment Plant No. 2 would involve demolition and site clearing; excavation, foundation, and underground construction; earthmoving and grading; construction of new buildings and other above-ground structures; restoration of existing facilities; and landscaping. **Table 6.4-1** shows typical noise levels generated by different types of construction equipment. Construction at Reclamation Plant No. 1 and Treatment Plant No. 2 would require the use of some combination of this equipment. **Table 6.4-1** shows that the noisiest non-impact construction equipment would generate noise at a level of approximately 68 to 96 dBA at 50 feet, assuming no noise mitigation features. Assuming an attenuation rate (lessening rate) of six dBA per doubling of distance, non-impact construction equipment would generate noise levels of 59 to 87 Leq at 150 feet (the distance to the closest residence) from the source at each of the plants. Under Scenario 2 at Treatment Plant No. 2, the closest residences (450 feet from the proposed construction activities) would typically be exposed to noise levels between 50 to 78 Leq. Other residences located at distances further away would be impacted to a lesser degree by construction noise. Intervening structures (e.g., treatment facility buildings, trees, berms) may partially shield some of the adjacent residences from construction noise. In particular, it is likely that the 10- to 12-foot wall bordering Treatment Plant No. 2 on to the west would attenuate noise from construction activities for residences along Brookhurst Street.

In addition to the use of non-impact construction equipment, installation of proposed equipment at Reclamation Plant No. 1 and Treatment Plant 2 would require the use of impact equipment (i.e., jackhammers and pile drivers). The need for pile driving would be determined by site-specific engineering studies. In general, secondary treatment facilities and digesters would require more piles than other treatment equipment (County Sanitation Districts of Orange County, 1989). As such, more piles would be required under Scenario 4 than Scenario 2, as more secondary treatment facilities would be installed. Up to 4,000 piles may need to be driven to provide support for proposed treatment facilities under Scenario 4. Each pile would take an estimated 20 to 30 minutes to drive, with no more than 12 to 16 piles being placed on a given day. Assuming an average of 12 piles per day and up to 4,000 piles, it is possible that over 300 days of pile-driving activity could occur. Exposure to pile driving noise would be less under other treatment scenarios. As shown in **Table 6.4-1,** pile drivers generate noise levels in the range of 95 to 101 L_{eq} at 50 feet. At a distance of 150 feet, noise levels would be between 86 to 92 L_{eq} during pile driving. Intermittent noises such as pile driving are more disturbing to many

people than typical construction noise. At noise levels of 85 dBA, normal conversation is extremely difficult, and sleep is impossible for most people.

As shown in **Tables 3-7 and 3-8** of the Project Description, the majority of the proposed construction would occur by 2005 under each of the treatment scenarios. Some additional construction would continue through project buildout in 2020.

TABLE 6.4-1
TYPICAL CONSTRUCTION EQUIPMENT NOISE LEVELS

Equipment	Noise Level at 50 feet (L_{eq})
Backhoes [a]	71-95
Dozers	74-93
Trucks	70-96
Pumps	69-80
Generators	69-82
Compressors	68-95
Pile Drivers	95-101

[a] Backhoes are a common type of excavator.

SOURCE: Harns, 1979; Bolt, Baranek, and Newman, 1971.

Because of the proximity of sensitive receptors to proposed construction areas and the anticipated existing daytime noise levels, daytime construction work could significantly affect the noise environment (increase noise levels by five dBA or more) of residences adjacent to Reclamation Plant No. 1 and Treatment Plant No. 2. While the majority of the proposed construction period would occur when most people are at work, retired persons, people who work at home, and people caring for children in their homes could be significantly affected by noise when construction activities occurred in their immediate vicinity. Since construction activities would substantially increase ambient noise levels at a noise-sensitive location, albeit temporarily, construction noise would be a significant effect of the project. The absolute increase in noise levels would be the same under the various treatment scenarios. Under Scenario 4, adjacent residences would be exposed to a greater amount of pile driving activity than under other treatment scenarios and would need to endure overall construction activities for a longer period of time.

Construction of the new secondary effluent pump station at Reclamation Plant No. 1 and the connecting pipeline to carry water from the secondary treatment facilities from Treatment Plant No. 2 to Reclamation Plant No. 1 would not occur until after 2005. During construction of the pump station, residences along Garfield Avenue would experience noise levels similar to those

described above. The connecting pipeline would be located in a District-owned strip of land adjacent to the Santa Ana River. Residences and other sensitive receptors along this corridor could be exposed to construction noise of a similar magnitude as residences adjacent to Reclamation Plant No. 1 and Treatment Plant No. 2.

Sensitive receptors located adjacent to project construction areas and along haul routes would also be subject to truck noise and construction worker commute trips to and from the sites during project construction. Truck volumes would vary with each phase of development, although the highest levels of truck traffic on local roadways would occur during the excavation phases of project construction. Daily construction truck volumes are unknown at this time. However, based on the existing traffic volumes on adjacent roadways, it is not expected that construction truck traffic would significantly affect ambient noise levels along haul routes to and from Reclamation Plant No. 1 and Treatment Plant No. 2.

District-Proposed Mitigation

Measure 6.4-1a: Construction activities will be limited to between the hours of 7:30 a.m. and 5:30 p.m. and as necessary to comply with local ordinances. Any nighttime or weekend construction activities would be subject to local permitting.

EIR-Identified Mitigation

Measure 6.4-1b: All equipment used during construction should be muffled and maintained in good operating condition. All internal combustion engine driven equipment should be fitted with intake and exhaust mufflers that are in good condition.

Measure 6.4-1c: OCSD shall hire an acoustical engineer to evaluate other alternatives for mitigating impacts from extensive pile driving activities.

Measure 6.4-1d: OCSD shall employ alternative foundation designs to avoid a need for pilings, or use cast-in-place pilings constructed in boreholes.

Measure 6.4-1e: Nearby sensitive receptors affected by construction shall be notified concerning the project timing and construction schedule, and shall be provided with a phone number to call with questions or complaints.

While these mitigation measures alone would not substantially reduce noise levels, they would make high construction-noise levels predictable and easier for residents to avoid.

With mitigation, construction activities would still increase ambient noise levels of residences adjacent to Reclamation Plant No. 1 and Treatment Plant No. 2 by more than 5dBA. The above measures would serve to reduce the increase in noise due to construction and would reduce the chance of exposing people to substantial noise levels. However, due to the duration of the impact and the magnitude of pile driving activity that would be required and its proximity to nearby residences, this impact would still be considered significant.

Measure 6.4-1f: Temporary sound barriers (blankets on pile drivers) will be required during the construction period at Reclamation Plant No. 1 to eliminate a nuisance condition to the closest residences when pile driving is taking place.

Significance after Mitigation: Significant, Unavoidable.

OPERATION

Impact 6.4-2: Operation of proposed new equipment at Reclamation Plant No. 1 and Treatment Plant No. 2 would generate noise levels above existing ambient levels in the project vicinity. Less than Significant with Mitigation Measures.

Expansion of Reclamation Plant No. 1 and Treatment Plant No. 2, as proposed in the Strategic Plan, would include installation of new wastewater treatment equipment. Some of the proposed equipment is known to generate noise and could affect ambient noise levels at off-site sensitive receptor locations (i.e., residential areas). For Reclamation Plant No. 1, residential land uses are located adjacent (within 85 feet) to the western boundary of the plant. Residences to the south and east are located further away from the plant. Residences in the vicinity of the plant experience noise levels between 60 and 65 CNEL. For Treatment Plant No. 2, residences west of the plant (across Brookhurst Street) are as close as 100 feet from the western boundary of the site. These residences experience noise levels of roughly 60 to 65 Ldn.

Potential noise generating facilities proposed as part of the Strategic Plan include headworks pumps, trickling filter clarifiers, aeration basins, blowers, DAF thickeners, digesters, belt filter presses, cake storage hoppers, and grit chambers. The actual number of new pieces of equipment that would be installed varies by treatment scenario. The proposed number of new pieces of equipment at Reclamation Plant No. 1 and Treatment Plant No. 2 are shown in **Table 3-2** and **3-3**, respectively. The corresponding locations of this equipment are shown in **Figures 3-8 and 3-11**. In general, Scenario 4 would require the maximum amount of equipment be installed, while Scenario 2 would require the least amount. The amount of equipment installed under the other scenarios would fall between these two. To the extent feasible, the proposed equipment would be located within enclosed buildings, underground, or otherwise shielded to attenuate noise. Some of the equipment would generate exhaust noise, or contain air compressors, generators, or blowers that would not be enclosed. Of particular concern is noise generated by blowers. Noise from blowers can vary greatly depending on their type (displacement or centrifugal), size and whether or not they are enclosed. For the most part, the proposed equipment would be operated continuously over a 24-hour period, with operations slowing slightly during nighttime hours in connection with decreased wastewater flows. The combination of noise generated by the proposed equipment under each of the scenarios could substantial impact ambient noise levels at off-site sensitive receptor locations.

Other proposed equipment that either does not generate noise or would be enclosed in such a way as to eliminate noise includes bar screens, primary clarifiers, secondary clarifier basins, clarifiers for BFG underflow, and holding tanks.

In addition to stationary source noise, increases in truck loading activities associated with increased solids handling activities could affect ambient noise levels. Truck loading activities at Reclamation Plant No. 1 are centrally located along the eastern boundary of the site. Based on the distance from nearby sensitive receptors, any increases in noise related to increased truck loading activities would likely go unnoticed by adjacent residences. Similarly, at Treatment Plant No. 2, the existing 10- to 12-foot high brick wall along the western boundary of the facility would be expected to shield residences along Brookhurst Street from increased noise associated with increased truck loading activities. (The potential for increased biosolids handling activities to affect ambient noise levels of residences along haul routes is discussed in Chapter 8.0, Biosolids Management, Setting, Impacts, and Mitigations.)

Operation of the proposed new effluent pump station at Reclamation Plant No. 1 would include the continuous operation of high capacity pumps. All pumps would be enclosed. Noise from pump operation could, however, escape through building vents. Pump station operation could affect the noise environment of residences across Garfield Avenue.

Sufficient information is not available to quantify the impact of the combined new equipment and truck loading operations on ambient noise levels at nearby off-site receptors. There is reason to believe, however that based on the proximity of sensitive receptors to the proposed new equipment and operational hours, the proposed Strategic Plan could result in a significant noise impact. The increase in noise levels would be expected to be incrementally higher under Scenario 4 as compared to other treatment scenarios.

EIR-Identified Mitigation

Measure 6.4-2: OCSD should establish a performance noise standard for operational noise at Reclamation Plant No. 1 and Treatment Plant No. 2. The performance standard should apply to the property line of each plant and should prohibit hourly average noise levels in excess of 55 dBA between the hours of 7:00 a.m. to 10:00 p.m. and 50 dBA between the hours of 10:00 p.m. and 7:00 a.m., as required by the Fountain Valley and Huntington Beach Noise Ordinances. Attainment of this performance standard would maintain noise levels at or below ambient levels at nearby receptor locations. Available mitigation to achieve the performance standard consists of locating noise sources away from sensitive receptors, installation of acoustical enclosures around noise sources, installation of critical application silencers and sequential mufflers for exhaust noise, installation of louvered vents, directing vent systems away from nearby residences, and constructing soundwalls at the property lines.

Significance after Mitigation: Less than Significant.

Impact 6.4-3: Workers at Reclamation Plant No. 1 and Treatment Plant No. 2 may be exposed to excess noise levels from the operation of new facilities. Less than Significant with Mitigation Measures.

Excessive noise levels can cause hearing loss and increase stress that could lead to such effects as nervousness, irritability, or constriction of blood vessels and heart disease. Excessive noise can reduce job performance and can contribute to accidents.

The OSHA-established regulatory limit for worker noise exposure is an eight-hour time-weighted average of 90 decibels measured on the "A" scale of frequency distribution (90 dBA). The action level requiring a hearing conservation program is 85 dBA. A hearing conservation program would involve regular noise exposure monitoring, audiometric testing of employees, providing hearing protection equipment to employees, and record keeping of collected information.

Means of controlling noise to meet OSHA workplace noise standards for both existing and proposed facilities are constructed routinely. For example, sound blankets and acoustic panels will be constructed in the digester control rooms and other support structures. If these controls are not effective, personal protective equipment is provided near the source of operations generating high sound pressure levels. Safety training is conducted to demonstrate the use and need for following the mandates of the hearing conservation program.

EIR-Identified Mitigation

> **Measure 6.4-3:** Noise control measures should be incorporated into the design of the facility. Once the facility is operational, a certified industrial hygienist or other qualified individual should measure the noise levels to which workers are exposed. If the OSHA 8-hour time weighted average exposure for any worker exceed the 85 dBA threshold, a hearing conservation program must be initiated and appropriate administrative and engineering controls must be put in place to reduce the noise to OSHA accepted levels.

Significance after Mitigation: Less than Significant.

REFERENCES – NOISE

Bolt, Baranek, and Newman, Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances, 1971.

California Department of Transportation, Noise, Technical Analysis Notes, Second Draft, 1991.

City of Fountain Valley, General Plan Noise Element, January 25, 1995.

City of Fountain Valley, Noise Control Ordinance, Chapter 6.28, December 15, 1976.

City of Huntington Beach, Municipal Code, Chapter 8.40, Noise Control, December 1993.

City of Huntington Beach, General Plan Noise Element, December 12, 1995.

County Sanitation Districts of Orange County, Draft Program Environmental Impact Report on Collection, Treatment, and Disposal Facilities Master Plan, March 1989.

Governor's Office of Planning and Research, CEQA Guidelines Revisions, October 26, 1998.

Harns, Cyril M., Handbook of Noise Control, 1979.

U.S. Department of Transportation, Urban Mass Transportation Administration, Guidance Manual for Transportation, Noise and Vibration Impact Assessment, July 1990.

6.5 AIR QUALITY

6.5.1 SETTING

LOCAL CLIMATE AND EXISTING AIR QUALITY

Reclamation Plant No. 1 and Treatment Plant No. 2 are both located in Orange County within the South Coast Air Basin. The climatological and meteorological conditions at these facilities are the same as the regional setting presented in Section 4.7 of this document.

EXISTING AIR POLLUTION SOURCES ON-SITE

The South Coast Air Quality Management District (SCAQMD) estimates that approximately 12,000 tons of air pollutants are emitted to the South Coast Air Basin per day. OCSD contributes approximately 0.15 percent of all stationary source emissions, and approximately 0.017% of total emissions including mobile sources (Kogan, 1999). Consequently, OCSD spends 2-3 million dollars per year to comply with air quality requirements to reduce air emissions to levels that would enable the South Coast Air Basin to achieve attainment of National Ambient Air Quality Standards (NAAQS), as previously discussed in Section 4.7, Air Quality (Regional Setting).

The following discussion summarizes OCSD's 1998 Annual Report and presents the existing air pollution sources at the two facilities including odor sources and the summarizes the quantity of air pollutants emitted from the operation of these two facilities.

Criteria Pollutants

Table 6.5-1 presents the breakdown of the source of emissions for each criteria pollutant in term of percentages. The Central Power Generation System (CGS) combustion equipment is the largest source of criteria pollutants at the OCSD facilities. Emissions sources include the CGS, portable and stationary combustion engines, boilers, flares, and wastewater treatment process units. A summary of the amount of each criteria pollutant emissions at Reclamation Plant No. 1 and Treatment Plant No. 2 during the last five years is presented in **Table 6.5-2**. **Table 6.5-3** summarizes daily emission limits for the CGS permits.

Electricity generated by the CGS is used by existing on-site processes including activated sludge, effluent disposal, headworks, primary treatment, sludge dewatering, sludge thickening, digestion, and solids loading. Additionally, the use of imported electricity results in off-site emissions of criteria pollutants at electrical power generating plants located throughout the utility's generating network. Estimates of emissions from these off-site sources are provided in **Table 6.5-4,** although the SCAQMD does not consider impacts to air quality from off-site energy producers to be significant unless the demand exceeds the off-site generator's capacity (1996 AQMP EIR).

Future air emissions for OCSD are based on projected energy needs. Energy projections to the year 2020 have been calculated and provided in this report based on projected increases in

wastewater flows and equipment requirements for the six different treatment scenarios. A discussion on energy demand and supply is presented in Section 6.10, Energy.

TABLE 6.5-1
PERCENTAGES OF CRITERIA POLLUTANT EMISSIONS FROM TREATMENT PLANT OPERATIONS FOR FISCAL YEAR 1997/98

Pollutant	Sources of Emissions	Percentages
Carbon Monoxide	Central Power Generator System (CGS)	99%
	Portable internal combustion engines (ICEs), boilers and flares	1%
Reactive Organic Compounds	CGS, boilers, flares	68%
	Wastewater treatment process units and plant maintenance activities	32%
Oxides of Nitrogen	CGS	97%
	Portable ICEs, boilers and flares	3%
Oxides of Sulfur	Combustion equipment	94%
	Wastewater treatment process units	6%
Particulate Matter – 10 microns	Combustion equipment	84%
	Wastewater treatment process units (sludge handling)	16%

SOURCE: Orange County Sanitation District, *1998 Annual Report: Operations & Maintenance*, 1998.

TABLE 6.5-2
CRITERIA POLLUTANTS EMISSIONS FOR FISCAL YEARS 1993-1998

Location/Fiscal Year	Emissions in Tons/Year				
	CO	TGNMO*	NO_x	SO_x	PM_{10}
Plant No. 1					
1993 – 1994	255.7	47.2	112.7	2.3	1.9
1994 – 1995	128.9	47.5	50.6	4.3	2.1
1995 – 1996	127.0	45.0	49.4	3.7	1.9
1996 – 1997	124.6	45.4	46.6	1.8	1.8
1997 – 1998	114.4	40.1	44.1	1.8	1.8
Plant No. 2					
1993 – 1994	590.4	52.6	103.7	1.4	5.6
1994 – 1995	299.3	46.1	75.3	4.3	5.1
1995 – 1996	323.3	47.8	81.2	2.5	5.5
1996 – 1997	302.7	46.3	75.6	2.2	5.3
1997 – 1998	300.9	46.7	75.0	2.4	5.5

* expressed as total non-methane hydrocarbons

SOURCE: OCSD, *1998 Annual Report: Operations & Maintenance*, 1998.

TABLE 6.5-3
SCAQMD DAILY EMISSIONS LIMITS FOR CENTRAL GENERATION SYSTEM

	Emissions in lbs/day				
	CO	Total Non-Methane Hydrocarbons	NO_x	SO_x	PM_{10}
Permit Limits					
Plant No. 1	1,102	276	368	36	36
Plant No. 2	2,644	372	828	84	72

SOURCE: OCSD, *Strategic Plan*, Vol.4, Sec. 11.

TABLE 6.5-4
CRITERIA POLLUTANTS FROM OFF-SITE EMISSIONS FOR IMPORTED ELECTRICITY (1997/98)

		Electricity			
Pollutant	Emis. Factor lbs/10^3 kWh	Plant 1 Est. Emission (lbs/day)[a]	Plant 2 Est. Emission (lbs/day)[b]	Total Emission (lbs/day)	Total Emission (tons/year)
CO	0.20	2.494	0.059	2.55	0.465
ROC	0.01	0.125	0.003	0.128	0.023
NO_x	1.15	14.341	0.340	14.681	2.68
SO_x	0.12	1.496	0.036	1.532	0.27
PM_{10}	0.04	0.499	0.012	0.511	0.09

a. Based on an 1997/98 electric purchase of 45,516 100kWh per year.
b. Based on an 1997/98 electric purchase of 1,080 100kWh per year.

SOURCE of Emissions Factors: SCAQMD, *CEQA Air Quality Handbook*, April 1993.
SOURCE of Electric consumption: OCSD, *Annual Report*, 1998

Air Toxics

Air toxic emissions are generated at the treatment facilities through two mechanisms: 1) through the release into the air of the toxic compounds that are present in the wastewater discharges from industrial, commercial, and residential sources, and 2) through the release of the toxic compounds through the combustion of gaseous fuels, such as digester and natural gases. The first of these mechanisms includes raw sewage emissions at the headworks, biosolids treatment and dewatering processes, and the secondary treatment aeration process.

The District has submitted inventories of toxic emissions to SCAQMD every four years pursuant to California State Assembly Bill AB2588 since 1991. The total amount of air toxics generated at the treatment facilities has decreased by almost 25 percent since 1991 due to the modifications

that have occurred in the treatment facilities. The most significant modification was the replacement of highly polluting candlestick-type flares with significantly less polluting flares. In addition, more than 30 smaller internal combustion engines (ICE) at various locations were replaced by digester gas and natural gas-fueled CGS.

SCAQMD's toxic source review process under Rule 1401, "New Source Review of Carcinogenic Contaminates" provides for a permit review process to be completed for any equipment modification or upgrade. SCAQMD permits for non-combustion sources will require modification when proposed new wastewater treatment facilities including digesters and aeration basins are installed. Permits to operate will be denied unless the applicant has substantiated that the cumulative air toxics emissions from all sources within a radius of 100 meters will not impact local sensitive receptors. The permit modification process includes the preparation of a risk assessment which may require the District to install Best Available Control Technology for toxics (T-BACT).

The SCAQMD is currently revising the air toxic source Rules 1401 and 1402. A no-net-increase policy for air toxics in the South Coast Air Basin could impact the District's expansion plans. The District, as an essential public service, is committed to working with the local community and regulatory agencies to obtain air quality goals while maintaining wastewater treatment services.

Odor

Hydrogen sulfide (H_2S) is normally the major source of odor problems at wastewater treatment plants. Numerous other odorous substances, including organic sulfides, organic amines, organic acids, and ammonia, are also present. All of these substances are produced by biological decomposition of organic matter in wastewater. Some may be added directly to wastewater from industrial or household chemical discharges.

OCSD has carried out an on-going odor control program since 1981. Odor reduction at Plant Nos. 1 and 2 has been a high priority, which has led to the development of fully integrated odor control facilities for the preliminary, primary and solids handling processes and on-site generation equipment at both plants. OCSD contains odors generated at both facilities by covering tanks, sumps and wet wells that may produce odorous compounds, and by enclosing wastewater treatment equipment and processes that might contribute to the overall odor emissions.

Presently, OCSD employs three types of odor reduction activities that comprise their odor control program. First is caustic soda (NaOH) injection at strategic locations within the collection system to inhibit slime (biological) growth on the sewer main walls. Second is the hydrogen peroxide (H_2O_2) injection at the headworks to chemically oxidize sulfate compounds prior to the initial treatment process. Third is the provision of collection/treatment facilities for odor control at the treatment plants; these facilities include the following:

- Pretreatment chemical addition within the collection system;
- Process enclosures (buildings, covers, and/or domes);
- Odor conveyance network (foul air ductwork);

- Odor treatment facilities (odor scrubbers);
- Odor control scrubbers support equipment (chemical handling); and
- Odor control treatment (absorption/oxidation).

Currently, OCSD has SCAQMD permits for the operation of the foul air scrubbers. OCSD also maintains records of H_2S concentration in the discharge of the foul air scrubbers as well as other process information, such as pH and differential pressure across each scrubber.

Odor complaints received at Reclamation Plant No. 1 and Treatment Plant No. 2 have been logged since 1981. The logs indicate that complaints have significantly decreased over the past 11 years, as shown in **Table 6.5-5**. Odor complaints are handled promptly. In 1997, in response to a few odor complaints from neighbors, the District installed a bleach addition system at the dewatering scrubbers to eliminate the non-H_2S odorous compounds and adjusted the foul air system at the solids storage and dewatering facilities to capture foul air more efficiently. Collection system odor monitoring programs are in place and future odor management strategies are being developed including information management, technical development, and operational improvement components (OCSD, 1998).

SENSITIVE RECEPTORS

Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved. Sensitive population groups include children, the elderly, the acutely ill and the chronically ill, especially those with cardio-respiratory diseases.

Residential areas are also considered to be sensitive to air pollution for CEQA purposes because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present (*CEQA Air Quality Handbook,* Chapter 5). Recreational land uses are considered moderately sensitive to air pollution. Although exposure periods are generally short, exercise places a high demand on respiratory functions, which can be impaired by air pollution. In addition, noticeable air pollution can detract from the enjoyment of recreation. Industrial and commercial areas are considered the least sensitive to air pollution. Exposure periods are relatively short and intermittent as the majority of the workers tend to stay indoors most of the time. In addition, the working population is generally the healthiest segment of the public.

The sensitive receptors in the immediate vicinity of Reclamation Plant No. 1 in Fountain Valley include schools, day care centers, and residential uses. Residential areas are located immediately west of the treatment facility across Ward Street and southeast across the Santa Ana River. The residences abutting Ward Street are less than 100 feet from the western boundary of the treatment facility. The air emissions produced by the CGS facility are emitted an additional 1,800 feet from the Ward Street boundary line. The residences across the Santa Ana River are approximately 450 feet from the Plant property line and an additional 450 feet from the CGS facility.

TABLE 6.5-5
NUMBER OF ODOR COMPLAINTS RECEIVED AT RECLAMATION PLANT NO. 1 AND TREATMENT PLANT NO. 2 BETWEEN 1981 AND 1998

Location/Year	Total Number of Complaints	Monthly Average
Plant No. 1		
1981 – 1982	42	4
1982 – 1983	19	2
1983 – 1984	28	2
1984 – 1985	20	2
1985 – 1986	10	1
1986 – 1987	21	2
1987 – 1988	19	2
1988 – 1989	3	0
1989 – 1990	10	1
1990 – 1991	6	0
1991 – 1992	4	0
1992 – 1993	1	0
1993 – 1994	0	0
1994 – 1995	2	0
1995 – 1996	1	0
1996 – 1997	0	0
1997 – 1998	16	1
Plant No. 2		
1981 – 1982	81	7
1982 – 1983	82	7
1983 – 1984	127	11
1984 – 1985	104	9
1985 – 1986	69	6
1986 – 1987	68	6
1987 – 1988	34	3
1988 – 1989	22	2
1989 – 1990	24	2
1990 – 1991	9	1
1991 – 1992	3	0
1992 – 1993	8	1
1993 – 1994	1	0
1994 – 1995	1	0
1995 – 1996	2	0
1996 – 1997	6	1
1997 – 1998	5	0

SOURCE: Orange County Sanitation District, *1998 Annual Report: Operations & Maintenance*, 1998.

The sensitive receptors in the immediate vicinity of Treatment Plant No. 2 in Huntington Beach include schools, daycare centers, and residential uses. Residential areas are located immediately west of the treatment facility across Brookhurst Street. The residences abutting Brookhurst Street are located approximately 100 feet northwest of the western boundary of the treatment facility, and another 900 feet from the CGS.

AIR QUALITY PERMITS AND REGULATIONS

Permits to Operate

SCAQMD regulates air quality through its permit authority over most types of stationary emission sources and through its planning and review activities. As shown in **Table 6.5-6**, the District currently operates Plant Nos. 1 and 2 under 67 SCAQMD Permits to Operate (County Sanitation District of Orange County, 1998). No notices of violations from SCAQMD were issued during fiscal year 1997/1998. This is in part due to the diligent efforts by the District to ensure compliance with all air quality permit requirements.

TABLE 6.5-6
EXISTING SCAQMD PERMITS AT PLANT NOS. 1 AND 2

Emission Source Categories	Number of SCAQMD Permits
Air Pollution Control Equipment:	
- Foul Air Scrubbers	8
- Spray Booth	1
- Flares	2
Internal Combustion Engines:	
- Central Power Generation Systems (CGS)	8
- Stationary – Emergency Power Generation (5 are located at pump stations in the service area)	16
- Portable – Power Generation (5 are for emergency use)	23
Wastewater Treatment and Support Facilities	2
Boilers	3
Fuel Storage and Dispensing Facilities	2
Gas Turbines (Emergency Power Generation)	2
TOTAL:	67

SOURCE: County Sanitation Districts of Orange County, *Operation & Maintenance, 1998 Annual Report*, 1998.

Title V Permits

District Plant Nos. 1 and 2 are also subject to the requirements of Title V of the 1990 Federal Clean Air Act Amendments (Title 40, Code of Federal Regulations, Chapter 1, Part 70). Both plants emit volatile organic compounds (VOCs), NOx and CO in excess of the threshold amounts that trigger the need for Title V permitting (County Sanitation Districts of Orange County, 1998).

Title V refers to the section of the federal Clean Air Act Amendments of 1990 that established a comprehensive operating program for major stationary sources. Though the U.S. EPA has implementation authority over the program, SCAQMD administers the Title V program in the South Coast Air Basin which includes Orange County. The Title V program calls for major stationary sources to secure a single permit that includes a listing of all the emissions sources, applicable regulations, and requirements. The Title V Permit would replace all of the air permits for individual pieces of equipment. Title V permits establishes detailed requirements governing emissions from facilities and related activities such as monitoring, recordkeeping and reporting, and requires periodic self-certification of compliance.

The District submitted its Title V permit applications for Plants Nos. 1 and 2 to the SCAQMD in March 1998 and July 1997, respectively. Upon submittal of these applications, OCSD certified that both facilities were in compliance with all applicable requirements. Pending additional review by U.S. EPA and SCAQMD staff and a public review period, it is anticipated that the Title V permits will be issued in December 1999 for Plant No. 2 and December 2000 for Plant No. 1.

Risk Management Plans

Section 112(r) of the Federal Clean Air Act requires the U.S. EPA to develop Risk Management Plans (RMPs) to prevent the accidental release of regulated hazardous substances and to minimize the consequences of such releases. RMP requirements are in Title 40 Code of Federal Regulations, Chapter 1, Part 68. The RMP program is similar in some ways to the Occupational Safety and Health Administration's (OSHA) Process Safety Management Program. However, where the OSHA program focuses on worker safety, the RMP program emphasizes the safety of the surrounding community. An RMP includes three major elements: (1) hazard assessment; (2) a prevention program; and, (3) an emergency response program. The District is required to complete an RMP because the amount of methane gas present in digester gas exceeds the regulatory threshold quantity. The District's completed RMP is due by June 21, 1999 (OCSD, 1998).

The California Accidental Release Prevention Program (Cal ARP, California Health and Safety Code Chapter 6.95) is similar to the federal program but more detailed. Its submission date is also June 21, 1999, and is administered by the local Orange County Health Care Agency and Huntington Beach Fire Department.

Emission Reduction Credits

The District currently has emission reduction credits (ERCs) available for future use as shown below. These credits may be used in obtaining new air emissions permits for new equipment or may be sold.

Constituent	Number of Credits (pounds per day)
Reactive Organic Gases (ROGs)	765
Sulfur Dioxide (SO_2)	155
Carbon Monoxide (CO)	132
Particulate Matter PM_{10}	1

6.5.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

Significance criteria establish a means by which impacts can be quantitatively evaluated. Thresholds impose barriers beyond which significant impacts could reasonably be expected. As a means of determining significance from non-permitted air emissions, the SCAQMD has established the following air quality thresholds of significance for construction activities and new project operations for non-permitted equipment:

	Project Construction	Project Operation
Carbon Monoxide	550 lbs. per day	550 lbs. per day
Reactive Organic Compounds	100 lbs. per day	55 lbs. per day
Nitrogen Oxides	100 lbs. per day	55 lbs. per day
Sulfur Oxides	150 lbs. per day	150 lbs. per day
Particulates (10 microns)	150 lbs. per day	150 lbs. per day

(These thresholds are established in the *CEQA Air Quality Handbook* prepared by the South Coast Air Quality Management District, 1993.)

The SCAQMD considers permit limits established for existing stationary source equipment to constitute thresholds over which significant impacts would be expected (*CEQA Guidelines*, Section 15064(h)).

The SCAQMD considers energy demand in excess of available off-site capacity to be a significant impact to air quality (1996 AQMP EIR).

CONSTRUCTION

Impact 6.5-1: Project development under any of the six project scenarios would generate short-term emissions of air pollutants, including dust and criteria pollutants, from demolition, construction and/or restoration activities. Significant and Unavoidable.

Construction of the proposed treatment facilities at the two plants would involve several general types of activities: 1) demolition and removal of some existing facilities, 2) grading currently unimproved property, 3) excavation and soil removal, 4) constructing process units, and 5) restoration and upgrade of existing facilities. Scenarios 1 through 6 share most of these activities.

In general, the construction would occur in periodic activity peaks, requiring brief periods of significant effort followed by longer periods of reduced activities. Construction crews may range from 100 to 500 workers depending on the construction schedule and process unit being installed. Facilities construction would be on-going over the next 20 years consisting of intermittent periods of intensive construction activities and longer design periods.

Construction under any of the project scenarios would generate short-term emissions of air pollutants. Construction-related emissions would primarily be dust generated from earthmoving, excavation and other construction activities; hydrocarbon emissions from paints and asphalt; exhaust emissions from powered construction equipment; and motor vehicle emissions associated with the construction activities. Since the final construction scheduling of specific facility projects has not been determined at this time, emissions associated with construction equipment cannot be estimated at this time. However, emission factors for typical construction equipment that may be used for general construction activities are shown in **Table 6.5-7**. Depending on the construction phase, the number of pieces of equipment used, and the duration of equipment use, air emissions associated with the operation of construction equipment may result in a significant short-term impact on air quality. The majority of the proposed facilities and improvements would occur by the year 2005; therefore, the greatest quantity of associated emissions is anticipated to occur within this time period. Intermittent construction emission peaks would occur over the next 15 years as future projects are developed.

Dust emissions would vary according to the level and type of activity, silt content of the soil and prevailing weather. Total PM_{10} emissions associated with excavation, grading, and earthmoving activities for Scenarios 1 through 4 are presented in **Table 6.5-8**. Since the number of construction days is not available at this time, daily PM_{10} emissions associated with the above activities cannot be estimated at this time, but average daily emissions are not anticipated to exceed the threshold of significance of 150 pounds per day. The emissions calculations in **Tables 6.5-8 and 6.5-9** are based on total cubic yards of soil to be excavated to the year 2020 for each treatment Scenario.

TABLE 6.5-7
CONSTRUCTION EQUIPMENT EMISSION FACTORS

Type of Equipment	POLLUTANT EMISSIONS (lbs/hr)				
	CO	ROC*	NO_X	SO_X	PM_{10}
Tracked Tractor	0.35	0.12	1.26	0.14	0.112
Wheeled Tractor	3.58	0.18	1.27	0.09	0.14
Wheeled Dozer/a/	- -	- -	- -	0.35	0.165
Scraper	1.25	0.27	3.84	0.46	0.41
Motor Grader	0.151	0.039	0.713	0.086	0.061
Wheeled Loader	0.572	0.23	1.90	0.182	0.17
Tracked Loader	0.201	0.095	0.83	0.076	0.059
Off-Highway Truck	1.8	0.19	4.17	0.45	0.26
Roller	0.30	0.065	0.87	0.067	0.05
Miscellaneous	0.675	0.15	1.7	0.143	0.14

* Although SCAQMD generally refers to volatile organic compounds (VOC) when issuing permit limits for stationary sources, the SCAQMD *CEQA Handbook* analyzes reactive organic compounds (ROC) for non-permitted, non-stationary sources.

/a/ The Wheeled Dozer CO/ROC/NO_X emissions are included in the off-highway truck category.

SOURCE: SCAQMD, *CEQA Air Quality Handbook 1993*, Table A9-8-A.

TABLE 6.5-8
PM_{10} EMISSIONS FROM EXCAVATION, GRADING AND EARTHMOVING ACTIVITIES

	Estimated PM_{10} Emissions (lbs/total construction period)			
	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Plant No. 1	706	750	1,240	1,442
Plant No. 2	150	184	398	398

SOURCE: SCAQMD, *CEQA Air Quality Handbook*, April 1993; Environmental Science Associates.

TABLE 6.5-9
ESTIMATED TOTAL HAUL TRUCK EMISSIONS TO 2020

	Estimated Emissions (lbs/total hauling period)			
	CO	ROC	NO_x	PM_{10}
Plant No.1				
Scenario 1[a]	2,525	525	5,146	437
Scenario 2[b]	2,684	558	5,468	465
Scenario 3[c]	4,432	921	9,030	768
Scenario 4[d]	5,156	1,072	10,507	893
Plant No. 2				
Scenario 1[e]	534	111	1,089	93
Scenario 2[f]	657	137	1,339	114
Scenario 3[g]	1,423	296	2,900	247
Scenario 4[g]	1,423	296	2,900	247

Note: Each haul truck is estimated to travel approximately 30 miles one-way; therefore, the number of truck trips is estimated to be twice (loaded + empty) the number of haul trucks used for the project.

a. Based on 2,803 trucks.
b. Based on 2,939 trucks.
c. Based on 4,433 trucks.
d. Based on 5,053 trucks.
e. Based on 780 trucks.
f. Based on 885 trucks.
g. Based on 1,539 trucks.

However, construction-generated dust would temporarily contribute to the relatively high existing background PM_{10} levels. Excesses of the State ambient PM_{10} standard are typical in Orange County and construction-related dust would contribute to these excesses in the project vicinity. Relatively large-sized particulates raised by construction would settle out of the atmosphere rapidly with increasing distance from the site. As a result, dustfall can be expected to occur on cars, streets, sidewalks, and other outside surfaces within a 200- to 800-foot radius of individual building sites. Construction would also generate very fine particulates which have been determined to be a health risk to the general population and especially school aged children and the infirmed, who are more susceptible to particulate pollution. Because PM_{10} thresholds are commonly exceeded in Orange County, project generated particulates would create a significant impact on sensitive land uses in the vicinity of the construction site during the demolition, grading, and excavation phases of the project. These land uses include local residents situated adjacent to or near the treatment plants.

Additionally, air emissions would result from haul truck trips associated with the removal of excavated earth from the treatment plants. These estimated emissions are presented in

Table 6.5-9. Since the number of construction days or daily truck trips is not available at this time, daily air emissions associated with the haul truck trips cannot be estimated at this time. However, it is estimated that no more than 55 truck trips can be generated per day to remain below the thresholds of significance for all criteria pollutants.

Similarly, air emissions would result from construction workers' trips. It is estimated that a maximum of 500 workers may be needed to implement the proposed facilities and improvements. To estimate the air emissions associated with construction workers' trips, it was assumed that each construction worker would generate two trips per day and travel a distance of 20 miles per trip, resulting in a total of 20,000 vehicle miles per day. This results in the daily emission of approximately 121 pounds of CO, 10 pounds of ROC, 25 pounds of NO_x, and less than one pound of PM_{10}.

Construction of the proposed treatment facility improvements under any of the project scenarios would involve a number of components, phases, and activities, as mentioned above; total emissions associated with project development, which would include emissions from construction equipment, haul trucks, construction worker's trips, excavation and grading, are anticipated to result in a short-term significant unavoidable impact on air quality.

The following mitigation measures should be implemented to reduce emissions associated with construction activities:

EIR-Identified Mitigation

Measure 6.5-1a: General contractors should maintain equipment engines in proper tune and operate construction equipment so as to minimize exhaust emissions. Such equipment shall not be operated during second stage smog alerts.

Measure 6.5-1b: During construction, trucks and vehicles in loading or unloading queues should be kept with their engines off, when not in use, to reduce vehicle emissions. Construction activities shall be phased and scheduled to avoid emissions peaks, and discontinued during second-stage smog alerts.

Measure 6.5-1c: General contractors should use reasonable and typical watering techniques to reduce fugitive dust emissions. All unpaved demolition and construction areas shall be wetted at least twice a day during excavation and construction, and temporary dust covers shall be used to reduce dust emissions and meet SCAQMD District Rule 403.

Measure 6.5-1d: Soil binders should be spread on site, unpaved roads, and parking areas.

Measure 6.5-1e: Ground cover should be re-established on the construction site through seeding and watering.

Measure 6.5-1f: Trucks should be washed off prior to leaving the construction site.

Significance after Mitigation: Significant, unavoidable.

OPERATIONS

Impact 6.5-2: Emissions at both treatment plants under any of the project scenarios would continue to result from stationary sources. Increasingly restrictive air quality regulations are anticipated in the near future to comply with federal air quality standards, making air emissions permits for new and modified equipment more difficult to obtain. This impact would be less than significant with mitigation measures.

Stationary Sources

Stationary on-site emissions are generated as a result of the combustion of natural gas and digester gas. Emissions from the CGS constitute the District's largest contribution to criteria pollutant emissions (see Table 6.5-1, above). The CGS is permitted by the SCAQMD to operate at a capacity of 5 MW at Plant No.1 and 13 MW at Plant No. 2. The CGS is not currently operating at capacity, but will increase output as power-demand increases. Air emissions generated by the projected total 18 MW capacity constitute the significance thresholds as set by the permit limits. Exceeding permit limits or violating permit conditions would constitute a significant impact. During the 1997/1998 fiscal year, all of the District's permitted equipment was in compliance with its permit requirements.

Although the District may be able to rely on the current CGS permitted capacity to the year 2020, full-secondary treatment (Scenarios 3 and 4) may require additional power by the year 2020. Additional engines or power-generating capacity would require additional permits or modifications to existing permits. Additional permits may be more difficult to obtain as more restrictive regulations are introduced to restore the air quality in the South Coast Air Basin.

The alternative to increasing CGS operations to generate more energy for the expanded treatment facilities would be to import the electricity needed to meet projected energy demands from Southern California Edison (SCE), or as de-regulation is put into effect, from some other supplier. As noted in the significance criteria section above, emissions from these off-site sources would not be attributable to the District's operations unless the energy demand exceeded the SCE existing capacity. This would not constitute a significant impact.

Non-Combustion Sources

Non-combustion sources of air pollutants include scrubbers, paint booths, fuel dispensing facilities, and wastewater treatment facilities including clarifier basins, solids handling, and aeration facilities. The District has one permit for each plant covering wastewater facility emissions. Wastewater treatment facilities emit small amounts of air toxics and criteria pollutants in proportion to the quantity of wastewater flowing through the plant. As the amount of wastewater increases in the next twenty years, the amount of air emissions would be expected to increase. As new facilities are added to the plant including clarifier basins and digesters, the air permits will be reviewed and updated. SCAQMD Rule 1401 requires air toxics risk assessments be performed when permits are modified. The SCAQMD will not approve of the modified permit if air emissions exceed threshold limits defined as quantities per day for criteria pollutants and as cancer risk for toxics.

SCAQMD Rules 1401 and 1402 are currently under revision. The revised Rules could mandate a no-net-increase policy for toxics. If the revised Rules eliminate new air toxics emissions, the District will be significantly impacted. As net flow is projected to increase in the next 20 years, so too are air emissions from non combustion sources. Additional wastewater treatment facilities including aeration basins, clarifiers, and digesters will require permit modifications. The projected emission increases from these new facilities are anticipated to be minor and less than significant under current Rules. However, a no-net-increase policy for air toxics could significantly impact District planning in the future.

District-Proposed Mitigation

Measure 6.5-2a: The District will research and implement ways of reducing NO_x and air toxics emissions from stationary sources, including non-combustion sources to meet future emission reductions that will be imposed by the SCAQMD.

Measure 6.5-2b: The District will comply with existing and future air quality regulations including SCAQMD Rules and permit requirements. As air quality regulations become more restrictive in the South Coast Air Basin coinciding with increased operational demand, the District will be required to reduce emissions through process modifications or by implementing new control technologies.

Significance After Mitigation: Less Than Significant.

Impact 6.5-3: Emissions at both treatment plants under any of the project scenarios would continue to result from mobile sources (i.e., vehicle trips). Emissions from mobile sources are projected to exceed the SCAQMD nitrous oxides significance threshold of 55 lbs/day. This would result in a significant impact to air quality.

Mobile Sources

For purposes of CEQA analysis, emissions of criteria pollutants from mobile sources contribute to the overall emissions from plant operations. This section describes mobile source emissions. **Table 6.5-10** projects total vehicle miles traveled (VMT) per day for mobile sources associated with plant operations. **Table 6.5-11** provides emissions projections. **Table 6.5-12** provides the SCAQMD significance thresholds. The District maintains several portable diesel-powered engines used as emergency back-up generators which could be viewed as mobile sources. These portable engines are permitted to operate under certain conditions. When these conditions are met, no impacts are anticipated to air quality.

Wastewater treatment requires the use of large quantities of chemicals. Chapter 6.10, Hazardous Materials provides more information on chemical usage. Future chemical usage estimates assume an increase commensurate with wastewater flow increases. Chemical usage for Scenario 2 could drop slightly initially due to the initial decrease in secondary treatment volume. Chemical usage for the full secondary Scenarios 3 and 4 is anticipated to increase approximately 30 percent since secondary treatment requires more chemicals (Ooten, 1999). **Table 6.5-11** provides emissions

quantities resulting from chemical delivery trucks, assuming the trucks operate on diesel fuel and average 60 mile round trips.

TABLE 6.5-10
ESTIMATED VEHICLE MILES TRAVELED PER DAY

VMT/day	Scenario 2		Scenario 4	
	2000	2020	2000	2020
Chemical Trucks	1,568	2,080	1,568	2,663
Grit and Screenings	25	33	25	33
Biosolids Trucks	8,285	14,992	9,863	18,455
Employee Commute	11,200	20,975	11,200	20,975
TOTAL	21,078	38,080	22,656	42,126

TABLE 6.5-11
ESTIMATED EMISSIONS FROM MOBILE SOURCES

Particulate Matter (PM_{10})lbs/day

	Scenario 2		Scenario 4	
	1998	2020	1998	2020
Chemical Trucks	0.95	0.77	0.95	0.77
Grit and Screenings	0.02	0.01	0.02	0.01
Biosolids Trucks	5.02	5.61	5.97	6.91
Employee Commute	0.12	0.23	0.12	0.23
TOTAL	6.11	6.62	7.06	7.92

Carbon Monoxide (CO) lbs/day

	Scenario 2		Scenario 4	
	1998	2020	1998	2020
Chemical Trucks	33.09	26.05	33.09	26.05
Grit and Screenings	0.53	0.42	0.53	0.42
Biosolids Trucks	174.82	190.54	208.12	234.55
Employee Commute	94.48	84.08	94.48	84.08
TOTAL	302.92	301.10	336.22	345.11

Nitrogen Oxides (NO_x) lbs/day

	Scenario 2		Scenario 4	
	1998	2020	1998	2020
Chemical Trucks	15.37	17.47	15.37	17.47
Grit and Screenings	0.25	0.28	0.25	0.28
Biosolids Trucks	81.21	127.80	96.67	157.31
Employee Commute	11.35	10.63	11.35	10.63
TOTAL	108.17	156.18	123.64	185.70

Impact 6.5-4: Modifying the current CGS or adding new power-generating equipment would require SCAQMD permit modifications. Energy requirements greater than the permitted CGS capacity of 18 MW would require permit modifications. New regulations may require permit reviews. Less Than Significant impact with Mitigation.

In order to increase the capacity of the CGS to meet energy requirements of full secondary treatment (i.e., up to 23 MW) the existing air emissions permits would require modifications. As SCAQMD Rules become more restrictive, these permit modifications may be denied based on the regional effort to improve the Basin's air quality.

EIR-Proposed Mitigation

Measure 6.5-4a: The District will purchase energy from off-site sources if air emissions permit modifications are denied.

Measure 6.5-4b: The District will continue to research clean-burning engines for the CGS, in an effort to increase power output while reducing criteria and toxic pollutants.

Measure 6.5-4c: The District will install Best Available Control Technology if necessary to comply with SCAQMD Rules.

Significance After Mitigation: Less Than Significant.

Impact 6.5-5: The project under each of the treatment scenarios could generate objectionable odors in the project vicinity and in other areas located downwind from the treatment facilities. Less Than Significant after Mitigation Measures.

As previously discussed, OCSD has carried out an on-going program for odor control since 1981. Odor reduction at both plant sites has been a high priority for OCSD, which has implemented many measures to control and reduce odors to produce extensive odor control facilities. These measures include the following:

- Installation of geodesic domes over the circular primary clarifiers in 1988. Each primary clarifier is covered, which allows foul (odorous) air to be collected and scrubbed;
- Construction and installation of foul air treatment scrubbers. The foul air contacts the recirculating scrubbing liquid, which reduces the H_2S before the air is exhausted to the atmosphere;
- OCSD adds hydrogen peroxide in the incoming trunklines of each plant to reduce H_2S and control odors;
- Installation of primary clarifier lauder valve to control the effluent launder level of the primary basins to reduce turbulence, thereby reducing generation of H_2S; and

- Caustic treatment of the trunklines; the trunklines are treated with caustic soda as soon as the 2 ppm of wet sulfides are detected in the wastewater.

The proposed treatment facilities improvements under any of the project scenarios would be designed to incorporate similar odor control measures to minimize odor emissions in the project vicinity and in areas located downwind of the treatment plants. In recent years the trend shows an increase in overall odor complaints from one in 1995 to six in 1997. Although occasional odor complaints probably cannot be totally eliminated, given the District's active management program, the long-term trend toward reduced odor problems and complaints is expected to continue.

Air emissions from several of the solids handling facilities including digesters and belt filter presses are currently not treated in the odor control equipment, because hydrogen sulfide levels are below regulatory standards. The need to resume treatment of these process air streams will be periodically evaluated. In addition, the need for odor control will be evaluated for new solids process units.

In addition, dewatering activities associated with excavation at the plant facilities can sometimes be odorous and could result in increased odor complaints. Increased odor complaints from construction activities is considered to be a significant impact which would be mitigated to less than significant levels as described below.

Mitigation Measures

Measure 6.5-5a: The District will evaluate the need for odor control equipment for future facilities to reduce fugitive foul odors and include odor control when necessary. The District will also periodically review air emissions from existing facilities to determine if odor control is necessary.

Measure 6.5-5b: When dewatering is required during excavation, the District shall provide odor control systems to reduce construction odor impacts when necessary.

Significance After Mitigation: Less Than Significant.

Impact 6.5-6: The project under each of the treatment scenarios would be in conformance with the population, employment, and housing assumptions and the goals of attaining air quality standards outlined in the Regional AQMP. Less than Significant.

Conformance of a project with the 1997 Air Quality Management Plan (AQMP) is judged on its consistency with the following: 1) population, employment, and housing assumptions upon which the AQMP was based and 2) stated policies of the AQMP. The 1997 AQMP (adopted in November 1996 by SCAQMD but not yet approved by EPA) calls on local jurisdictions to prepare annual cumulative impact reports that evaluate consistency with AQMP assumptions for

cumulative development rather than individual local projects. Growth management is one of the control measures included as part of the AQMP.

The SCAQMD has found that a project is consistent with the AQMP if it is consistent with the local General Plan or Air Quality Element prepared by the affected local jurisdiction. Land use development levels from local General Plans were used to identify socioeconomic and travel characteristics that, in turn, provided the basis for air pollutant projections in the AQMP. These same land use-based population predictions were used to calculate estimated gallons per capita per day (gpcd) within the OCSD Service Area. State and federal conformity requirements stress the importance of matching estimated gpcd with regional projections. Chapter 11, Growth Inducement provides more detailed discussion on conformity with the current Southern California Association of Governments (SCAG) AQMP.

Implementation of the proposed project under any of the treatment scenarios would be consistent with the Land Use Elements of the City of Fountain Valley (Reclamation Plant No. 1) General Plan and of the City of Huntington Beach (Treatment Plant No. 2) General Plan. Therefore, the treatment plant improvements under any of the project scenarios would be in conformance with the City of Fountain Valley General Plan and the City of Huntington Beach General Plan and would, in turn, be consistent with the AQMP.

Mitigation Measures

No mitigation measures are required.

REFERENCES – AIR QUALITY

OCSD, *Operations & Maintenance, 1998 Annual Report*, 1998.

OCSD, *Strategic Plan*, Volume 4, Section 11, prepared by Camp Dresser and McKee, 1999.

South Coast Air Quality Management District, *CEQA Air Quality Handbook*, April 1993.

South Coast Air Quality Management District, *Air Quality Management Plan, Environmental Impact Report*, November 1996, p. 4.2-10.

California Air Resources Board, CARB, *Maps and Tables of the Area Designations for State and National Ambient Air Quality Standards and Expected Peak Day Concentrations and Designation Values*. January 1997

Kogan, Vlad, OCSD air quality specialist, personal communication, 5/13/99

Krause, Mike, South Coast Air Quality Management District, CEQA specialist, personal communication, 5/21/99

6.6 GEOLOGY

6.6.1 SETTING

SOILS

Soils underlying Reclamation Plant No. 1 and Treatment Plant No. 2 have been extensively modified by man. Sludge spreading areas, which have historically occupied most of the open land at each site, have been disturbed to a depth of four feet, permanently altering soils both structurally and chemically. As soils at Reclamation Plant No. 1 and Treatment Plant No. 2 were originally peat bogs, all construction of these sites has required extensive foundation work with cement "pillars" buried up to 15 feet under some structures for support (CSDOC, 1977).

SEISMICITY

The geologic substructure underlying Orange County, like much of Southern California, is subject to considerable tectonic stress. The major fault structures within Orange County are the San Andreas fault, San Jacinto fault, Whittier-Elsinore fault, Newport-Inglewood fault, and Palos Verdes fault (see **Figure 4-3**, Section 4.8, Geologic Hazards and Soils). However, the fault zone of relevance to this project (due to the proximity to the project site) is the Newport-Inglewood fault.

The Newport-Inglewood fault zone in the Los Angeles Basin consists of a series of short, discontinuous, northwest-trending right-lateral faults, relatively shallow anticlines and subsidiary normal and reverse faults extending approximately 36 miles from the Santa Monica Mountains to offshore Newport Beach. A segment of the fault zone also extends from Newport Beach to about 6 miles southeast of San Onofre. A trace of the fault has been identified between Reclamation Plant No. 1 and Treatment Plant No. 2. Treatment Plant No.2 is considered to be within the Newport-Inglewood Fault zone.

Few specific geological studies for the Newport-Inglewood fault zone have been conducted, but historical record has shown that potentially damaging earthquakes have occurred every few years. During the last 65 years, numerous earthquake shocks have occurred along the fault zone ranging from 3.0 to 5.0 on the Richter scale. The most damaging was the March 1933 Long Beach quake, with a magnitude of 6.3. The Newport-Inglewood Fault zone is zoned active[1] under the Alquist-Priolo Earthquake Fault Zoning Act[2] by the California Department of Mines and Geology. Despite the lack of recent surface displacements of known faults along the zone and the absence of extensive damage in recent years, the fault zone is considered a significant potential hazard to the highly developed coastal area.

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1 An "active" fault is defined by CDMG as one which has had surface displacement within the Holocene time (about the last 11,000 years).

2 The purpose of this Act is to prohibit the placing of habitable structures across traces of active faults and thereby mitigate the hazards of surface fault rupture along earthquake faults considered to be "sufficiently active and well defined as to constitute a potential hazard to structures from surface faulint or fault creep."

Groundshaking

Earthquakes in Orange County potentially could produce strong groundshaking in the project area. Groundshaking is partly related to the size of an earthquake, the distance from the epicenter, and the response of the geologic materials at the site. As a rule, the greater the earthquake magnitude and the closer the fault rupture to the site, the greater the intensity of groundshaking and potential damage to facilities. Deep unconsolidated materials amplify earthquake waves. As discussed, the Newport-Inglewood fault zone is a known active fault within the project site.

Liquefaction

Liquefaction is the rapid transformation of saturated, loose, fine-grained sediment (such as silt and sand) to a fluid-like state because of earthquake groundshaking. As groundshaking induces a rapid rise in excess pore pressure and the soil loses its bearing strength, it may spread laterally, undergo settlement and form fissures and sand boils (upwelling of sand at the surface). Liquefaction has resulted in substantial loss of life and injury, plus damage to property, roads and infrastructure. In addition, liquefaction increases the hazards of fires because of explosions induced when underground gas lines break and because the breakage of water mains substantially reduces fire suppression capability.

Liquefaction is a possible hazard at the project site due to the sandy surface soils, underlying peat bog, and high water table.

Settlement

Strong ground motions that occur during earthquakes are capable of inducing forms of adjustments. Settlement is the gradual downward movement of an engineered structure due to compaction of unconsolidated material below the foundation. Settlement accelerated by earthquakes could result in vertical or horizontal separations of structures or portions of one structure, cracked foundations, and in severe situations, building collapse and bending or breaking of underground utility lines.

6.6.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

Adverse impacts are considered significant if implementation of the project could subject people, structures or other resources to geologic or seismic hazards. A project would have a significant effect on the environment if it were to create the following conditions:

- Expose people or structures to major geologic hazards which include ground surface rupture, seismic groundshaking, ground failure (including liquefaction), landslides, subsidence, or expansive soils;

- Involve changes in topography that would result in unstable soil conditions; or
- Cause erosion or loss of topsoil.

CONSTRUCTION AND OPERATION

Impact 6.6-1: Project facilities, under any of the treatment scenarios, would be located in areas susceptible to primary and secondary seismic hazards (groundshaking, liquefaction, settlement). Damage to facilities could result in the event of a major earthquake. Less than Significant with Mitigation Measures.

The project, which includes the construction of additional wastewater treatment facilities, is located in a region of strong seismic activity and would be subject to groundshaking. While the risk of groundshaking at the plant sites is high, minimum damage to the plants is anticipated. Project facilities would be susceptible to secondary seismic hazards, such as liquefaction and settlement, due to the sandy surface soils, underlying peat bog, and high water table. Liquefaction and settlement can damage structural foundations and can cause pipes to crack and/or rupture and may disrupt alignment of pipes. All facilities would be designed and constructed in accordance with current engineering practices, including the California Building Code, and all applicable seismic engineering guidelines; therefore, impacts to facilities would be mitigated to a less-than-significant level.

Although Treatment Plant No. 2 is zoned within the Alquist-Priolo Fault Zoning Act, hazards to people would not be a concern because this project does not propose habitable structures.

District-Proposed Mitigation

Measure 6.6-1a: During the project design phase for all facilities, the District will perform design-level geotechnical evaluations. The geotechnical evaluations will include subsurface exploration and review of seismic design criteria to ensure that design of the facilities meet seismic safety.

Site-specific testing for soils susceptible to liquefaction would be conducted. If testing results indicates that conditions are present that could result in significant liquefaction and damage to project facilities, appropriate feasible measures will be developed and incorporated into the project design. The performance standard to be used in the geotechnical evaluations for mitigation liquefaction hazards will be minimization of the hazards. Measures to minimize significant liquefaction hazards could include the following:

- Densification or dewatering of surface or subsurface soils.
- Construction of pile or pier foundations to support pipelines and/or buildings.
- Removal of material that could undergo liquefaction in the event of an earthquake and replacement with stable material.

Recommendations of the geotechnical report will be incorporated into the design and construction of proposed facilities.

Measure 6.6-1b: The District will design and construct new facilities in accordance with District seismic standards and/or meet or exceed seismic, design standards in the most recent edition of the California Building Code

Significance after Mitigation: Less than Significant.

Impact 6.6-2: Groundshaking could cause spills of raw sewage, causing a significant impact to public health. Less than Significant impact with Mitigation Measures.

Pipeline breaks, leaks, or other damage during an earthquake could result in the release of raw or partially treated sewage to the Santa Ana River. Such a spill could cause significant impacts to public health prompting beach closure.

OCSD currently maintains an emergency overflow weir (Discharge Serial No. 003) into the Santa Ana River at Treatment Plant No. 2. According to the OCSD's 1998 Annual Report, this overflow weir is an extreme emergency discharge point. Treated wastewater may be discharged at this point by overflow to the Santa Ana River, but only in extreme situations when discharging outfalls No. 1 and No. 2 are unavailable for use. When utilizing Discharge Serial No. 003, the effluent overflows to weirs into discharge pipes that flow to the Santa Ana River. This would only occur during a utility power failure that coincides with peak-flow periods, loss of the central generation system gas-driven equipment, or a loss of the temporary generation system powering the electric pumps at either the Foster Outfall Booster Station or the Ocean Outfall Booster System (OOBS). This plant design feature provides emergency discharge capability and is referenced as such in the National Pollutant Elimination Discharge System (NPDES) permit. Santa Ana River discharge may also occur if Discharge Serial No. 001 was out of service due to a catastrophic event (such as an earthquake) and total flow was greater than Discharge Serial No. 002 could accommodate (OCSD, 1998).

In addition, chemicals used in the treatment processes, such as chlorine, caustic soda, and ferrous chloride, could be released to the atmosphere and surface water, resulting in significant impacts. OCSD maintains a Spill Prevention Containment and Countermeasures Plan (SPCC) which would be implemented in the event of a chemical spill. Section 6.9, Hazardous Materials, describes the SPCC. In addition, Section 6.9 describes the Integrated Emergency Response Program (IERP), which covers worker safety, spill prevention, emergency response, and hazardous materials management.

District-Proposed Mitigation

Measure 6.6-2a: The District will implement the Spill Prevention Containment and Countermeasures Plan (SPCC).

Measure 6.6-2b: Secondary containment, such as berms, will be used to contain and divert toxic chemicals from wastewater flows and isolate damaged facilities to reduce contamination risks.

Significance after Mitigation: Less than Significant.

REFERENCES – GEOLOGY

Cervellone, Chris, OCSD Engineering Supervisor, Construction and Design, Personal Communication, 23 April 1999.

CSDOC Wastewater Management Program, *Draft Environmental Impact Statement*, March 1977.

CSDOC, *Operations and Maintenance Annual Report,* 1998.

Fountain Valley, City of, 1995. *City of Fountain Valley General Plan,* 1993.

Huntington Beach, City of, 1996. *City of Huntington Beach General Plan,* 1996

Orange County Water District and the Orange County Sanitation District, *Draft Program EIR/Tier 1 EIS, Groundwater Replenishment System*, November 1998.

6.7 HYDROLOGY

6.7.1 SETTING

See Section 4.9 (in Chapter 4, Regional Setting) for a discussion on surface and groundwater resources in the project area.

FLOODING

The Santa Ana River has been called the most serious flood threat in the Western U.S. by the Army Corps of Engineers (OCWD and OCSD, 1998). Within the study area, there are about 100,000 acres in the floodplain. Flooding of the Santa Ana River has occurred as early as 1825, creating the sandbar which is now the highly developed Balboa Peninsula. However, this flood was minor compared to the January 1862 flood which turned the western alluvial plain of Orange County into an inland sea. More recently, in 1969 major flooding occurred in Newport Bay, Silverado, Santiago, Modjeska, and Trabuco Canyons.

The District's Reclamation Plant No. 1 and Treatment Plant No. 2 are adjacent to the Santa Ana River and within the 100-year floodplain of the river. The District's facilities are protected from flooding by walls and levees which were constructed by the Army Corps of Engineers in 1995.

Reclamation Plant No. 1 is location 4 miles from the coast at an elevation of approximately 25 feet above mean sea level. Treatment Plant No. 2 is located near the coast at an elevation of approximately 8 feet above mean sea level. This plant is potentially subject to damage from a tsunami. Historically, Orange County has not experienced a tsunami of magnitude greater than the high storm tides that periodically threaten the coast (Orange County General Plan, Seismic and Safety Element 1975). However, the Orange County coastal area is subject to potential tsunami damage when combined with high tides. Impacts from a tsunami originating in the Aleutian Trench near Alaska were felt in Long Beach in 1976. Although that tsunami caused only $100,000 in damages, the potential for greater damage exists. Because local faults are parallel to the coast, the magnitude of risks associated with tsunamis are reduced in this area. Additionally, offshore islands provide protection to the Orange County coast from the brunt of the impacts of tsunamis originating from the Aleutian Trench.

GROUNDWATER

Due to the location of Reclamation Plant No. 1 and Treatment Plant No. 2 near the coast, these facilities are susceptible to encountering groundwater at shallow depths. The depth to groundwater is tidally influenced, varying from season to season, and year to year. Consequently, dewatering operations have been necessary during construction activities. The District has established dewatering operation standards for contractors performing work within the boundaries of the treatment plants.

Discharge of water from dewatering operations is governed by a NPDES permit (No. CAG998001) issued by the RWQCB. The District requires contractors to comply with the District's dewatering specifications of operation.

STORM WATER DRAINAGE

Both Plant's internal drainage system are designed to collect and treat storm water. The system is also designed to collect wastewater and chemical spills from industrial areas of the site. Storm water that does not come in contact with the treatment process area, such as along perimeter roads, is allowed to drain off-site to undeveloped areas on the plant site. All storm water runoff associated with the process areas is currently captured, treated, and disposed through the ocean outfall.

The District's NPDES permit requires the preparation and submittal of a Storm Water Management Plan (SWMP). The SWMP for construction and operation activities include an operational plan describing definitive measures, i.e., BMPs, to be used to control potential storm water pollution. A SWMP establishes a schedule for monthly and annual, dry and wet weather water sampling. **Table 6.7-1** describes the best management practices (BMP) that have been implemented at each plant in order to prevent stormwater pollution. The SWMP identifies potential pollutant sources such as stored chemicals and treatment equipment.

For construction activities exceeding five acres of a site, the District is required to file a Notice of Intent (NOI) for coverage under the General Permit for Discharges of Storm Water Associated with Construction Activities (General Construction Permit). Policies and procedures currently exist at Reclamation Plant No. 1 and Treatment Plant No. 2 to address potential storm water runoff associated with large scale construction activities.

6.7.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

A project would significantly impact the environment if it were to create any of the following conditions:

- Substantially degrade or deplete water resources;
- Redirect surface water flows;
- Increase flood hazard by 100-year flood, seiche, tsunami, or mudflow
- Alter course of streambed;
- Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.

TABLE 6.7-1
STORMATER BEST MANAGEMENT PRACTICES IMPLEMENTETD BY OCSD

Area / Activity	Potential Pollutant Source	Pollutant	Existing Best Management Practices
Industrial Processes • Metering & diversion • Bar screens • Headworks • Primary clarifiers • Secondary clarifiers • Trickling filters • Sedimentation basins • Dissolved air floatation unit • Aeration basins • Digesters • Drying beds • Biosolids dewatering and storage	Failure of pumps, piping, or tanks resulting in leaks, spills or overflows.	Raw sewage or biosolids	• Employees are trained in proper handling procedures. • Emergency Response staff are trained in proper response and clean-up procedures. • Emergency shut-off valves are installed. • Exterior walls of pipes and storage containers are routinely checked and maintained. • All catch basins drain to the closest appropriate plant process.
Material Storage/ Shipping / Receiving	Container spills or leaks; Spills during material delivery.	Hydrogen peroxide, sodium hydroxide, ferric chloride, sodium hypochlorite, polymer, hydrochloric acid, diesel, gasoline, lube oil, waste oil	• Employees are trained in proper handling procedures. • Emergency Response staff are trained in proper response and clean-up procedures. • Process chemicals are stored within double walled tanks and/or secondary containment. • Other hazardous materials are covered and/or stored with secondary containment. • Petroleum products are stored in underground storage tanks.

TABLE 6.7-1 (Con't)
STORMATER BEST MANAGEMENT PRACTICES IMPLEMENTETD BY OCSD

Area / Activity	Potential Pollutant Source	Pollutant	Existing Best Management Practices
Material Storage/ Shipping / Receiving (con't)			• All catch basins drain to the closest appropriate plant process
Biosolids Shipping	Leaks or spills when filling trucks from overhead hoppers; Hosing or washing down trucking area	Dewatered biosolids	• Employees are trained in proper handling procedures. • All catch basins drain to the closest appropriate plant process.
Vehicle and Equipment Fueling	Spills caused by topping off fuel tanks	Gasoline, diesel	• Employees are trained in proper handling procedures. • Emergency Response staff are trained in proper response and clean-up procedures. • Topping-off fuel tanks is discouraged. • Shut-off valves are maintained on nozzles. • Signs indicate who to contact in case of spills.
	Hosing or washing down fuel area	Gasoline, diesel, lube oil, waste oil, transmission fluids, radiator fluids	
Vehicle Maintenance	Spills and leaks during maintenance activities	Gasoline, diesel, lube oil, waste oil, transmission fluids, radiator fluids	• Employees are trained in proper handling procedures. • Emergency Response staff are trained in proper response and clean-up procedures. • Equipment is kept clean, preventing excessive grease/oil buildup.
	Container spills or leaks	Solvents, degreasers, other cleansers	
	Hosing down work areas	Gasoline, diesel, lube oil, waste oil, transmission fluids, radiator fluids, solvents, degreasers, other cleansers	

TABLE 6.7-1 (Con't)
STORMATER BEST MANAGEMENT PRACTICES IMPLEMENTETD BY OCSD

Area / Activity	Potential Pollutant Source	Pollutant	Existing Best Management Practices
Vehicle Maintenance (cont'd)			• Drip pans are used for any leaking vehicle/equipment. • All maintenance is completed in proper, covered location. • All catch basins drain to the closest appropriate plant process.
Area / Activity	Potential Pollutant Source	Pollutant	• Existing Best • Management Practices
Storm Water Basins	Basin overflow	Sediment	• Prevent sediment-containing runoff from leaving Plant 2 using structural BMPs including permanent asphalt berms. • Pump storm water from South Basin to drying beds.

CONSTRUCTION

Impact 6.7-1: Construction of any of the treatment system scenarios could result in an increase in erosion and siltation into surface waters. Construction could also result in chemical spills (e.g., fuels, oils, or grease) to stormwater, and increase turbidity and decrease water quality in waters of the U.S. Less than Significant with Mitigation Measures.

Construction activities involving soil disturbance, such as excavation, stockpiling, and grading could result in increased erosion and sedimentation to surface waters. As described in the setting section, the general drainage system for both plants allows for storm water runoff to be captured, treated, and discharged to the Pacific Ocean as treated wastewater. Since the existing SWMP procedures and requirements would minimize or eliminate adverse impacts to water quality, this impact would be less than significant.

Under Scenarios 3 and 4, where construction may occur on over five acres, the OCSD would be required to file a Notice of Intent (NOI) with the California State Water Resources Control Board for coverage under the General Permit for Discharges of Storm Water Associated with Construction Activities (General Construction Permit). Policies and procedures currently exist at Reclamation Plant No. 1 and Treatment Plant No. 2 to address potential storm water runoff associated with large scale construction activities.

District-Proposed Mitigation

Measure 6.7-1a: The District will implement Best Management Practices (BMPs) as outlined in the SWMP.

Measure 6.7-1b: The District will train construction and operation employees in storm water pollution prevention practices. Individual contractors performing construction at each treatment facility shall be required to comply with provisions of the SWMP.

Measure 6.7-1c: The District will inspect and maintain all on-site storm water drains and catch basins on plant property regularly.

Measure 6.7-1d: The District will apply the SARWQCB's recommended BMPs during construction and operation as specified in the SWMP.

Measure 6.7-1e: For construction involving disturbance greater than five acres of land, the District will incorporate into contract specifications the following requirements:

- The contractor(s) will comply with the RWQCB requirements of the NPDES General Permit for Discharges of Storm Water Associated with Construction Activity. The contractor will implement control measures that are consistent with the General Permit and with the recommendations and policies of the RWQCB. This would include submitting a Notice of Intent and site map to the RWQCB, developing a Storm Water Pollution Prevention Plan, and implementing site-specific best management practices to prevent sedimentation to surface waters.

Significance after Mitigation: Less than Significant.

Impact 6.7-2: Pile driving and excavation activities at Reclamation Plant No. 1 and Treatment Plant No. 2 may encounter groundwater, and local dewatering may be required. Less than Significant with Mitigation Measures.

As discussed in the setting, the depth to groundwater is tidally influenced, varying from season to season, and year to year. Historically, groundwater has been encountered during grading and excavation activities at both treatment plants. Construction contractors are required to propose dewatering methods that would ensure dry excavation, preserving the final lines and grades of the bottoms of excavated areas. Contractors would be required to conform with the District's Dewatering Specifications (Cervellone, 1999).

Water from dewatering activities has typically been disposed of through the treatment plant effluent system and discharged to the ocean. Discharge of water from dewatering operations is governed by the OCSD's Stormwater NPDES permit issued by the RWQCB.

District-Proposed Mitigation

Measure 6.7-2a: Construction contractors will comply with the District's Dewatering Specifications.

Measure 6.7-2b: Water from dewatering operations will be disposed of in a suitable manner in conformance with a NPDES permit, as approved by the RWQCB.

Significance after Mitigation: Less than Significant.

OPERATION

Impact 6.7-3: Reclamation Plant No 1. and Treatment Plant No. 2 are located in the 100-year floodplain of the Santa Ana River. New facilities proposed under any of the scenarios considered would expose structures and people to a 100-year flood event and/or effects of a tsunami. Less than Significant With Mitigation Measures.

If a 100-year flood event were to occur, both plants could be inundated by one to three feet of water. Flooding caused by a tsunami could damage the facilities at Treatment Plant No. 2 and subsequently release raw or partially treated sewage and chemicals associated with treatment, including chlorine, hydrogen peroxide, ferrous chloride, and other chemicals, to surface water, streets, and the Pacific Ocean and beaches. Such a release could result in significant impacts to public health. The location of the treatment plants near the Santa Ana River, and in the case of Treatment Plant No. 2 directly upstream from the coast, minimize the public health impacts. Water inundating either plant would be expected to drain out to sea rather quickly. Only certain down-stream neighborhoods of Fountain Valley and Huntington Beach and coastal waters would

face possible public health threats from treatment plant inundation in the event of a catastrophic flood.

The existing berms at each plant used to contain toxic chemical spills would also provide limited protection to critical facilities by diverting flood waters from a tsunami. However, the chance of a tsunami occurring during an extremely high storm tide is small. Therefore, risk of significant impacts is small.

EIR-Identified Mitigation

Measure 6.7-3a: The District should construct and maintain secondary containment berms to protect against release of toxic chemicals in an event of a spill from flooding.

Measure 6.7-3b: The District should coordinate with the Army Corp of Engineers to ensure levees located adjacent to Reclamation Plant No. 1 and Treatment Plant No. 2 continue to provide adequate protection for a 100-year flood event.

Measure 6.7-3c: The District should adhere to the Emergency Contingency Plan and the Flood Protection Plan to minimize the affects of flooding and tsunamis to Reclamation Plant No.1 and Treatment Plant No. 2. These measures should include hazard awareness notifications to neighborhoods downstream from Reclamation Plant No. 1.

Measure 6.7-3d: The District should adhere to Orange County's flood protection program as implemented by the Orange County Flood Control District.

Significance after Mitigation: Less than Significant.

Impact 6.7-4: Construction and long-term operation of the proposed improvements to both treatment plants would increase the area of impervious surface and result in an incremental increase in surface runoff in these areas. Less than Significant with Mitigation Measures.

Scenario 4 proposes more treatment facilities than Scenario 2, and therefore, the impervious surface resulting from project construction would be greater. However, the drainage systems at both plants have the capacity to accommodate increase runoff. The general drainage system for both plants allows for storm water runoff to be captured, treated, and discharged to the Pacific Ocean as treated wastewater. Since the existing SWMP procedures and requirements would minimize or eliminate adverse impacts to water quality, this impact would be less than significant.

Under any of the scenarios considered, the OCSD would fulfill the requirements of the NPDES through the planning and implementation of a SWMP for each Plant. The SWMP specifies BMPs for the prevention of storm water pollution from each Plant.

The implementation of **Measures 6.7-1a** through **6.7-1d** would ensure that impacts associated with increase stormwater runoff (from operation of new facilities) would be reduced to a less than significant level.

Significance after Mitigation: Less than Significant.

REFERENCES -- HYDROLOGY

Cervellone, Chris, OCSD, Construction and Design, Personal Communication.

CSDOC Wastewater Management Program, *Draft Environmental Impact Statement*, March 1977.

CSDOC, *Operations and Maintenance Annual Report 1998.*

Fountain Valley, City of, 1995. *City of Fountain Valley General Plan,* 1993.

Huntington Beach, City of, 1996. *City of Huntington Beach General Plan,* 1996

Orange County Water District and the Orange County Sanitation District, *Draft Program EIR/Tier 1 EIS, Groundwater Replenishment System*, November 1998.

6.8 PUBLIC SERVICES

6.8.1 SETTING

This section discusses police, site-security, fire protection, and potable water supply issues for both plants. Energy demand and supply is discussed in Section 6.10. Stormwater management is discussed in the Section 6.7, Hydrology.

POLICE, SECURITY, AND FIRE PROTECTION

Reclamation Plant No. 1

Police services in Fountain Valley are provided by the Fountain Valley Police Department with 65 officers operating out of one police station. These officers do not routinely enter the plant property, but would be called in case of a security emergency. The District maintains a separate on-site security program including access gates and perimeter walls and fences, sentry guards, and 24-hour security patrols.

The Fountain Valley Fire Department consists of 43 officers operating out of two stations. The Fountain Valley Fire Department inspects the facility annually. The District currently sends hazardous material inventories to the Fire Department pursuant to the Business Plan Act of 1985. The Fountain Valley Fire Department, in coordination with Metro-Net (an inter-agency cooperation agreement) provides emergency fire and disaster assistance services to the District. The Orange County Health Care Agency, Department of Environmental Health inspects both plant sites on a monthly basis.

Treatment Plant No. 2

Police services for Plant No 2. are provided by the Huntington Beach Police Department with 235 officers and 3 stations. However, as with Reclamation Plant No. 1, the District maintains a private security program consisting of perimeter security, sentry guards, and 24-hour on-site patrols.

The Huntington Beach Fire Department provides emergency services for the Huntington Beach plant in addition to providing District staff with emergency response and hazardous materials handling training.

POTABLE WATER

Potable water is supplied to Reclamation Plant No. 1 by the City of Fountain Valley. No substantial changes are planned for the District's potable water system under the Strategic Plan. Potable water is supplied to Treatment Plant No. 2 by the City of Huntington Beach.

As with Reclamation Plant No. 1, the Orange County Health Care Agency, Department of Environmental Health inspects the plant on a monthly basis.

INTEGRATED EMERGENCY RESPONSE PROGRAM

The District has designed a comprehensive Integrated Emergency Response Program (IERP) covering operations and maintenance activities at both plants. The program covers worker safety issues as well as systems failures and natural disaster contingencies. Worker safety training and hazard communication are at the core of the program. The Huntington Beach Fire Department has conducted training programs for District staff covering hazard communications, emergency response, first aid, and hazardous waste management. In the future, the District would manage in-house emergency response through the full implementation of the IERP. Policies and procedures currently in place include the preparation of and incident command system (ICS) site safety plans for construction and maintenance work, a Spill Prevention Containment and Countermeasure (SPCC) plan, and hazardous materials storage and hazardous waste management programs. (Carnahan, 1999)

6.8.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

A project would have a significant impact on public services and utilities if it would:

- Interfere with or substantially change demand for government services
- Generate a need for new utility systems
- Result in water demand beyond local water supplier's capacity
- Reduce the existing fire, police, or emergency services currently provided to the project area

CONSTRUCTION

Impact 6.8-1: Project implementation would result in disruption to wastewater treatment processes. Less than Significant.

The majority of the proposed treatment facilities are new. A limited number of existing treatment facilities would be upgraded (e.g., capacity of headwork pumps). During construction, facilities that would be upgraded would be taken off-line until improvements are completed. However, standby facilities would be used to maintain continued service. If disruption of plant processes occurs, a decline in effluent quality may result or odors could be generated at the plants. Back-up pumps and scheduled outages would be employed to maintain wastewater services. Less Than Significant Impact.

Mitigation Measures

No mitigation measures are necessary.

OPERATION

Impact 6.8-2: Expansion of the District's treatment operation under the Strategic Plan would not cause substantial increase demand for public services including police, security, fire protection or water supply.

Police, Security, and Fire Protection

The District is in the process of training staff and preparing an in-house Integrated Emergency Response Program to manage hazards and emergency response issues in-house in the future. The Huntington Beach Fire Department would act as emergency back-up once this program is in place, but would not be called on as the first responder. The District would continue to submit hazardous materials inventories to the Fire Department as mandated by the Business Plan Act of 1985. Implementation of the Strategic Plan would have a less significant impact on these services.

Water

Projected water demand quantities are summarized in **Table 6.8-1**. These projections assume that the rate of potable water consumed by OCSD during the base case 1997/98 fiscal year would increase each year commensurate with the projected total flow rate. Since full-time employees are expected to remain relatively constant through the year 2020, the potable water consumption may actually be less than projected below.

Potable water consumption for Scenario 4 is anticipated to be similar to the Scenario 2 projection, since the process functions using potable water are generally primary treatment facilities and administration facilities, and staffing is not projected to increase significantly for full secondary scenarios.

Mitigation Measures

No mitigation measures are necessary.

TABLE 6.8-1
MONTHLY AVERAGE CITY WATER CONSUMPTION (kcu ft)

Fiscal Year	Plant 1	Plant 2
1997-8	459	1,294
Projected for Scenario 2		
2000	490	1,380
2005	545	1,538
2010	590	1,664
2015	612	1,725
2020	634	1,786

REFERENCES – PUBLIC SERVICES

Brown, Bob, Captain, Huntington Beach Fire Department, personal communication, 12 April 1999.

Carnahan, Pat, OCSD Operations and Maintenance, personal communication, 12 April 1999.

Johnson, Don, Lieutenant, Huntington Beach Police Department, personal communication, 12 April 1999.

Josway, Terry, OCSD Operations and Maintenance, personal communication, 12 April 1999.

Lieutenant Hanrahan, Mike, Watch Commander, Fountain Valley Police Department, personal communication, 12 April 1999.

OCSD, *Operations and Maintenance Annual Report*, 1998

Satterfield, Ron Fountain Valley Fire Department, personal communication, 12 April 1999.

6.9 HAZARDOUS MATERIAL USAGE

6.9.1 SETTING

REGULATORY BACKGROUND

Hazardous materials handling is subject to numerous laws and regulations at all levels of government. Federal and State laws require detailed planning to ensure that hazardous materials are properly handled, used, stored, and disposed of and in the even that such materials are accidentally released into the environment, to prevent or to mitigate injury to health or the environment. A few of those requirements pertaining to the District's operations are included below.

Worker safety is regulated through Federal Occupational and Health Administration (OSHA) as well as the State version, Cal/OSHA. Federal OSHA establishes in the Code of Regulations Title 29 (CFR 29) 40 hours of training for hazardous materials operators. The training includes personal safety, hazardous materials storage and handling procedures, and emergency response procedures.

The California Hazardous Materials Release Response Plans and Inventory law of 1985 (Business Plan Act) requires businesses that store hazardous materials on site prepare an inventory and submit it to local health and fire departments.

The U.S. Department of Transportation regulates hazardous materials transportation. State agencies with primary responsibility for enforcing federal and State regulations and responding to hazardous materials emergencies are the California Highway Patrol and local Fire Departments.

The District is currently preparing a Risk Management Plan (RMP) in compliance with the Federal Clean Air Act, to assess risk management issues at both plants including explosion hazards from stored methane and liquid oxygen. The RPM will include strategies to remove hazard potential for surrounding areas and will be completed in June of 1999.

CHEMICAL USAGE

Large quantities of chemicals are used in the wastewater treatment process including ferric chloride and anionic polymers used to enhance primary sedimentation and control digester sulfide, cationic polymers used to assist in the sludge thickening and dewatering processes, caustic soda used in the air scrubbers, and hydrogen peroxide used for odor control. Treatment Plant No. 2 stores liquid oxygen in two 37,500-gallon storage tanks for use in the aeration basins. The use of gaseous chlorine was discontinued in 1993. In 1994, ferric chloride replaced ferrous chloride to reduce hydrogen sulfide in the digesters. **Tables 6.9-1** and **6.9-2** summarize historic chemical usage and projected chemical quantities used in the wastewater treatment process. Future chemical usage was estimated assuming that quantities would increase commensurate with projected flow rates.

TABLE 6.9-1
PAST AND PROJECTED ANNUAL MONTHLY AVERAGE PROCESS CHEMICAL USAGE AT RECLAMATION PLANT NO. 1 (SCENARIO 2)

Fiscal Year	Hydrogen Peroxide (gallons)	Caustic Soda (gallons)	Ferric Chloride (gallons)	Sodium Hypochlorite (gallons)	Polymer Dewatering (gallons)	Polymer DAF Units (gallons)
1997-8	13,300	2,710	110,000	8,300	40,000	4,170
Projected						
2000	14,187	2,891	117,333	8,853	42,667	4,448
2005	15,804	3,220	160,000	9,862	110,000	11,120
2010	17,107	3,486	171,000	10,676	110,000	11,120
2015	17,733	3,613	176,000	11,067	110,000	11,120
2020	18,359	3,741	182,000	11,457	110,000	11,120

TABLE 6.9-2
PAST AND PROJECTED ANNUAL MONTHLY AVERAGE PROCESS CHEMICAL USAGE AT TREATMENT PLANT NO. 2 (SCENARIO 2)

Fiscal Year	Hydrogen Peroxide (gallons)	Caustic Soda (gallons)	Ferric Chloride (gallons)	Sodium Hypochlorite (gallons)	Polymer Dewatering (gallons)
1997-8	22,100	8,000	194,500	15,800	62,800
Projected					
2000	23,573	8,533	161,000	16,853	35,000
2005	26,260	9,506	180,000	18,774	40,000
2010	28,427	10,290	200,000	20,323	45,000
2015	29,467	10,667	200,000	21,067	50,000
2020	30,507	11,043	220,000	21,810	55,000

In addition to process chemicals, the District maintains several underground storage tanks storing diesel and gasoline. Hydrochloric acid (HCl) is stored in four above ground storage tanks and is used by support services for equipment cleaning. The laboratory also stores small quantities of chemicals used in analysis methods. The laboratory's Safety Department implements a separate laboratory hazard communication program, worker safety program, and chemical inventory system.

Future process chemical usage estimates assume an increase commensurate with wastewater flow increases. Chemical usage for Scenario 2 could drop slightly initially due to the initial decrease in secondary treatment volume. Chemical usage for the full secondary Scenarios 3 and 4 is

anticipated to increase approximately 30 percent since secondary treatment requires more chemicals (Ooten, 1999).

The use of liquid oxygen in the activated sludge treatment would increase for the full-secondary scenarios. Reclamation Plant No.1 does not use liquid oxygen. In the 1997/98 fiscal year, activated sludge treated 67 mgd or approximately 25 percent of the total influent of 255 mgd. This amount would be expected to double by the year 2020 for the full secondary scenarios to treat an additional 74 mgd, increasing liquid oxygen usage 100 percent. Other chemical quantities would remain as projected for Scenario 2.

Chemical delivery trucks per month are listed in **Table 6.9-3**. Truck trips would be double this amount considering a two-way journey. These projections assume that each truck delivery averages 2,500 gallons. Since Scenario 2 would reduce amounts of secondary treatment from current levels, the number of truck trips would initially decrease.

TABLE 6.9-3
ESTIMATED TRUCK TRIPS PER MONTH FOR CHEMICAL DELIVERIES

	Plant No. 1	Plant No.2	Total
1998	71	121	193
Scenario 2			
2000	76	98	174
2005	124	110	234
2010	129	122	251
2015	132	124	256
2020	135	135	270
Scenario 4			
2000	99	126	225
2005	163	141	304
2010	170	156	327
2015	174	160	333
2020	177	174	352

Ferric chloride is added to the wastewater as part of advanced primary treatment. With its slight negative ionic charge, it acts as a coagulant precipitating solids removal in conjunction with positively charged polymers. Polymers used in advanced primary treatment have a slight ionic charge but are relatively inert. They are stored in solid form and are added to the wastewater after the ferric chloride.

Sodium hydroxide (NaOH), also known as caustic soda, is a highly basic substance used in air scrubbers to neutralize hydrogen sulfide odors. This material is considered the most hazardous

chemical stored in large quantities at the site. Caustic soda can cause severe burns to skin and clothing and can severely corrode equipment coming in contact with it. However, it constitutes a worker safety hazard and does not readily vaporize or pose a threat to off-site receptors.

Hydrogen peroxide (H_2O_2) is a moderately powerful oxidizing agent. It is a stable, easy-to-use chemical and a good source of active oxygen. It can oxidize numerous chemical compounds but can only selectively control bacteria. It controls anareobic organisms but it has little effect on aerobic organisms. Consequently, hydrogen peroxide is not effective in reducing coliform bacteria in wastewater effluent, but is an effective odor control agent for trunk lines.

The Strategic Plan discusses future disinfection capabilities for both existing outfalls. Currently sodium hypochlorite (NaOCl) in liquid form (liquid bleach) is stored on site and is used for small quantity cleaning purposes. The liquid bleach storage could be used to disinfect the effluent if necessary. The District does not store gaseous chlorine on site and has no plans to do so. Gaseous chlorine stored in large quantities can pose a significant health risk to surrounding communities in the event of an accidental release. The use of gaseous chlorine was discontinued in 1993 and the District has no plans to return to the use and storage of gaseous chlorine.

NaOCl solutions, used in place of gaseous chlorine, are unstable and some chlorine vapor can be released in the event of a spill. However, chlorine vapor production is minimal in comparison to pressurized gaseous chlorine. Equipment used within the spill containment areas must have corrosion protection. The District would continue to use NaOCl for disinfection purposes under each of the proposed scenarios.

Sodium bisulfite ($NaHSO_3$) is a white powder granule used generally as a dechlorination agent. The District does not currently store or treat wastewater with this chemical but may be required to do so in the future should disinfection measures be implemented. Storage of this chemical would be similar to sodium hypochlorite. Sulfur dioxide (SO_2) often used for dechlorination purposes in wastewater treatment facilities is not planned for OCSD. SO_2 poses community health risks in the event of a spill similar to the gaseous chlorine impacts. Sodium bisulfite would be used instead.

Hydrochloric acid (HCl) of 10 to 15 percent solutions is stored on both plant sites. The acid is capable of causing mild burns to skin but is not considered an explosion or toxic cloud hazard to neighboring areas. HCl is used to clean digesters and other solids handling equipment during routine maintenance procedures.

Liquid oxygen is stored in two 37,500-gallon above ground storage tanks in the Treatment Plant No. 2 aeration basin facility. This is considered the District's most hazardous storage facility due to the explosion and fire hazard. One accident involving two fatalities occurred in 1994 at the activated sludge facility. The workers apparently encountered an oxygen-rich environment caused by a leak in the system during construction activities. The oxygen ignited and burned the

two workers. Since the accident, the activated sludge facility has been upgraded to prevent a similar situation. Worker safety training conducted for all workers within the activated sludge facility emphasizes precautions when working near the system. The District is currently upgrading the fire alarm system at each plant site.

INTEGRATED EMERGENCY RESPONSE PROGRAM

The District has implemented an Integrated Emergency Response Program (IERP) covering worker safety, spill prevention, emergency response, and hazardous materials management. The plan includes the Spill Prevention Containment and Countermeasure (SPCC) Plan required by the Santa Ana Regional Water Quality Control Board. The SPCC plan provides structural specifications for storage tanks including over-flow alarms and secondary containment volumes, visual monitoring schedules for aboveground storage tanks, underground storage tank tightness testing schedules, emergency response procedures, and reporting requirements. The SPCC was last updated in 1997.

The IERP also includes safety procedures for operations and maintenance workers, including worker safety training, hazard communications, personal protective equipment, site security, and departmental organization. The IERP includes training in and implementation of the incident command system (ICS) for managing crisis situations.

HAZARDOUS WASTE DISPOSAL

The District's treatment facilities both have hazardous materials storage areas. The laboratory at Reclamation Plant No. 1 has a separate hazardous materials storage area. Hazardous waste is also collected in centralized locations. The District plans to consolidate these locations in the future to minimize spill hazards and reduce the collection time for contracted waste disposal operators.

6.9.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

On the basis of CEQA standards, a project would generally be considered to have a significant adverse environmental impact if it would create a potential public health hazard; involve the use production, or disposal of materials that pose a hazard to people, animal or plant populations in the area affected; or if it would interfere with emergency response plans or emergency evacuation plans.

Impact 6.9-1: Increasing quantities of hazardous materials stored on site could impact public health in the event of a catastrophic spill or explosion. Increasing liquid oxygen storage could increase the hazard. Less than Significant with Mitigation Measures.

The District currently operates a rigorous safety program designed to protect worker safety and neighboring areas. The Huntington Beach Fire Department has taken an active role in providing hazardous materials and emergency response training for the District. The District is currently implementing an emergency response program to handle first response internally. This system will utilize the Incident Command System. The Huntington Beach Fire Department and the Fountain Valley Fire Department in coordination with neighboring communities provide back up emergency response. Continued implementation of the District's safety program will reduce the level of impact on worker safety to less than significant levels.

Most of the chemicals used by OCSD do not pose a significant health risk to surrounding land uses. The District is in compliance with hazardous materials regulations including spill prevention and emergency response plans. Operations and maintenance workers are trained in hazardous materials handling.

The methane collection and storage system and the liquid oxygen storage system within the activated sludge facility pose potential worker safety hazards. Most of the hazards associated with the treatment process impact worker safety. However, an explosion or fire in the digesters of at the liquid oxygen storage site could impact neighboring areas as well in the event of a natural disaster or hostile attack. Neighboring areas include residential areas north of the site across Brookhurst Avenue.

Since liquid oxygen is currently used on site, the implementation of any of the six treatment scenarios would not introduce this impact. However, increasing liquid oxygen storage facilities to accommodate a 100 percent usage increase for Scenarios 3 and 4 could create a significant hazard. The Risk Management Program should include methane and liquid oxygen.

EIR-Identified Mitigation

Measure 6.9-1a: Worker safety training should emphasize hazards of liquid oxygen and stored methane. Routine safety measures including hazard communication should be adopted and strictly enforced in hazardous areas. Hazard training and communication should include laboratory operations and routine process chemical use.

Measure 6.9-1b: If additional liquid oxygen storage facilities are installed, the District should research explosion and fire potential to determine explosion arc perimeters. If neighboring land uses are not adequately distant, the District should reconfigure the oxygen storage facility to remove explosion hazards on neighboring land uses.

Measure 6.9-1c: Liquid oxygen operations should be included in the District's Risk Management Program.

Significance after Mitigation: Less than Significant.

REFERENCES

Carnahan, Pat, Orange County Sanitation District (OCSD), personal communication, 21 April 1999.

Ooten, Bob, OCSD, personal communication, 25 May, 1999

OCSD, *Operations and Maintenance Annual Report*, 1998.

OCSD, *Strategic Plan, Volume 4* Section 5, 1999.

6.10 ENERGY DEMAND AND SUPPLY

6.10.1 SETTING

ENERGY USAGE

The District's electric power is derived primarily from the central generation systems (CGS) operating at each plant. The CGS use clean-burning internal-combustion engines to burn digester gas and natural gas to produce electric power and heat. Back-up generators at both plants operate on diesel fuel and are reserved for emergency use. Both Plants are also connected through substations to the Southern California Edison (SCE) system for supplemental and emergency electricity needs. Excess electricity produced by the CGS is sold to SCE using these substation connections. During the 1997/98 fiscal year, the District imported approximately 20 percent of its electricity demand from SCE. The CGS exported a combined monthly average 875,000 kwh of electricity to SCE in 1997/98.

The CGS at Reclamation Plant No. 1 is permitted to produce 5 megawatts (MW) and currently produces 4.5 MW. The CGS at Treatment Plant No. 2 is permitted to produce 13 MW and currently produces 8.8 MW. The projected combined energy needs for Scenario 2 at Reclamation Plant No. 1 and Treatment Plant No. 2 are 13,889 kW by the year 2005 and 17,189 kW by the year 2020. Based on these projections, the CGS, with a 23,500 kW rating, has the capacity to meet plant operational demands through the year 2020 for Scenario 2 using digester gas and purchased natural gas.

Since secondary treatment requires a significant amount of energy, the full secondary treatment Scenarios 3 and 4 would require more energy to operate. Projected power needs are anticipated to increase to 19,410 kW by the year 2005 and 23,448 kW by the year 2020. These projections incorporate estimated increase in influent volume and are estimated to be accurate to plus or minus 10 percent. Currently, the combined generation capacity for both plants is 23,500 kW indicating that the existing CGS has just enough capacity for full secondary treatment to the year 2020. Projected total energy consumption between 2000 and 2020 is 3.0 billion kwh for Scenario 2 and 4.1 billion kwh for Scenario 4. **Table 6.10-1** summarizes projected energy needs.

The activated sludge aeration basins at both plants currently account for approximately 20% of the District's total annual energy consumption. Increasing secondary treatment capacity would increase this percentage. The CGS would continue to produce most of the required energy to the year 2020. The District plans to continue using the CGS as it primary source of electricity.

TABLE 6.10-1
PROJECTED ENERGY NEEDS FOR RECLAMATION PLANT NO. 1 AND TREATMENT PLANT NO. 2 (kW)

	2005		2020	
	Scenario 2	Scenario 4	Scenario 2	Scenario 4
Plant 1	5,462	5,667	7,044	8,252
Plant 2	8,427	13,744	10,145	15,196
Total	13,889	19,410	17,189	23,448

Source: OCSD, Strategic Plan, Vol. 4 Section 12

However, cleaner burning engines and innovative new power generation technologies are under consideration. At this point, the District has no plans to employ additional power generating equipment.

The total amount of electricity used during the 1997/98 fiscal year as well as future projections for the year 2020 for both plants (including administrative building usage) are summarized in **Table 6.10-2. Table 6-10.3** shows the same figures converted to British Thermal Units (Btu).

TABLE 6.10-2
NET ENERGY USAGE
(purchased and produced)

	1997/98	2005		2020	
		Scenario 2	Scenario 4	Scenario 2	Scenario 4
Plant 1	35,796,767	47,844,196	49,641,863	61,707,299	72,290,213
Plant 2	67,065,100	73,820,235	120,393,229	88,870,186	133,117,976
Total	102,861,867	121,664,431	170,035,092	150,577,484	205,408,189

Note:

1) The current electricity usage figures were calculated by adding the total amount of power generated by the central generation plants with the total amount of electricity imported from SCE minus the electricity exported to SCE.

2) The projected usage figures for Scenarios 2 and 4 have been calculated based on the increase in process units required for each Scenario. The amount of energy required by each treatment process is provided in Volume 4, Appendix D of the Strategic Plan.

TABLE 6-10.3
NET ENERGY USE EQUIVALENT
(BILLION BTU/YR)

	1997/98	2005		2020	
		Scenario 2	Scenario 4	Scenario 2	Scenario 4
Plant 1	12.2	16.3	17.0	21.1	24.7
Plant 2	22.9	25.2	41.1	30.3	45.5
Total	35.1	41.5	58.1	51.4	70.1

Note: 1 kwh = 3,415 Btu

The California Energy Commission reports that the average household electricity use in California is 6,300 kilowatt hours per year. In 1993, the total electricity consumption for industrial consumers in the State of California was 50.8 billion kilowatt hours. The District's electricity consumption is 0.02 percent of that amount.

IMPORTED ELECTRICITY

The District imported 4,790,000 kwh (1.64×10^{10} Btu) of electricity from SCE in 1997/98, accounting for approximately 20 percent of the District's annual electricity consumption. Most of the imported electricity for Reclamation Plant No. 1 went to the laboratory, control center, and administration buildings. Future imported energy demand would depend on the ability to utilize the CGS capacity. With the implementation of the CGS at each plant in the early 1990s, demand for imported electric power reduced dramatically from 1,382,000 kwh/month in 1992 to 32,000 kwh/month in 1997/98. Future electricity pricing in a de-regulated market coupled with changing air emissions regulations would also impact effective use of the existing CGS.

IMPORTED NATURAL GAS

Approximately 247.9 million cubic feet (Mcf) of natural gas was burned in the CGS for Plant No. 1 and approximately 86.2 Mcf in Plant No. 2 in 1997/98 fiscal year. Approximately 219.7 Mcf of digester gas was burned in Plant No. 1 in fiscal year 1997/98 and 1,067.7 Mcf in Plant No. 2.

The CGS at Reclamation Plant No. 1 consumes approximately 40 percent digester gas and 60 percent natural gas with a production capacity of 5 megawatts. The facility at Treatment Plant No. 2 consumes approximately 90 percent digester gas and 10 percent natural gas with a production capacity of 13 megawatts. Natural gas is used to power the CGS, but it is also used for administrative building and shop heating and for process boilers. The District imported a total of 4,457,000 therms (4.9×10^{11}Btu) of natural gas during the 1997/98 fiscal year. Approximately 7,700,000 therms of digester gas were consumed in the 1997/98 fiscal year, accounting for 60 percent of the total amount of gas consumed; natural gas constituted approximately 40 percent.

Table 6.10-4 summarizes future natural gas usage if the District continues to meet energy demand with natural gas. Projections for full secondary treatment assume that secondary treatment facilities consume approximately 20 percent of total energy consumption. These projections are provided for comparison only.

TABLE 6.10-4
MONTHLY AVERAGE IMPORTED NATURAL GAS (THERMS)

Year	Plant No. 1		Plant No. 2	
1997-98	219,600		73,600	
Projections	**Scenario 2**	**Scenario 4**	**Scenario 2**	**Scenario 4**
2000	234,240	327,936	78,507	109,909
2005	260,936	365,311	87,454	122,436
2010	282,466	395,452	94,670	132,538
2015	292,800	409,920	98,133	137,387
2020	303,134	424,388	101,597	142,236

The California Energy Commission reports that the total amount of natural gas consumed for residential customers was 5.28 billion therms in 1994. The total amount of natural gas consumed for utility and electric generation in the State of California in 1994 was 10.02 billion therms. The District consumes approximately 0.003 percent of that amount.

ON-SITE VEHICLE OPERATIONS

The District has recently installed compressed natural gas (CNG) filling stations for each plant and has attempted to convert on-site machinery to operate on CNG. Biosolids transport trucks will use CNG in the near future as much as possible. However, these facilities are newly installed and the conversion program has not yet been fully implemented at the time of this publication.

Two 12,000-gallon underground gasoline storage tanks exist on site in addition to several underground diesel storage tanks of varying sizes. This fuel is used for on-site vehicles and for emergency back up generators.

6.10.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

A project would normally have a significant effect on the environment if it would use fuel or energy in a wasteful manner, encourage activities which result in the use of large amounts of energy, would exceed the capacity of local energy utilities to generate or transmit energy to the project, or would decrease the reliability or amount of energy available to current utility customers.

CONSTRUCTION

Impact 6.10-1: Construction activities for each scenario would result in the use of fuel to operate heavy machinery and to transport workers to the site. Less than significant.

Construction energy expenditures would occur throughout the duration of the Strategic Plan period. Construction energy demands would not exceed the locally available energy (i.e., for diesel, gasoline, and compressed natural gas fuels), and would not constitute a significant amount of energy. This impact is less than significant.

Mitigation Measures

No mitigation measures are required.

OPERATION

Impact 6.10-2: Each of the proposed scenarios would result in increased energy consumption to meet energy requirements to the year 2020. Less than Significant Impact.

As a result of the CGS energy production capabilities, the projected increase in energy demand for each scenario would not significantly impact regional electricity sources. Energy usage projections to the year 2020 anticipate a 50 percent increase for Scenario 2 and a 100 percent increase for Scenario 4. The District's current energy production capacity at the CGS (23,500 MW) appears adequate to accommodate either Scenario, providing that energy could be wheeled from the CGS at Plant No. 2 to Plant No. 1. However, full secondary treatment will require up to 19,410 MW in 2005 and 23,448 MW in 2020. Although the CGS currently has equipment to produce 23,500 MW, air emission permits currently provide for a maximum of 18 MW. Modifying equipment air permits may prove more difficult in the future due to the increasing pressure to reduce pollutants to the South Coast Air Basin. **Table 6.10-5** summarizes the amount of electricity required in excess of the 18 MW for Scenarios 2 and 4 for the year 2020. The amount of energy required in excess of the 18 MW does not constitute a significant impact.

The District is already optimizing energy resources by using digester gas. The guidelines for significance indicate that an impact would be significant if it used energy or fuel in a wasteful manner, or if it consumed large quantities of fuel. The increased use of energy for the efficient treatment of municipal wastewater for the general benefit of public health does not constitute a wasteful use of fuel.

TABLE 6-10.5
ESTIMATED ELCETRICITY REQUIRED
IN EXCESS OF PERMITTED CAPACITY AT CGS

	2005		2020	
	Scenario 2	Scenario 4	Scenario 2	Scenario 4
kW	--	1,410	--	5,448
kWh/yr	--	12,351,600	--	47,724,480

SOURCE: OCSD

Mitigation Measures

No mitigation measures are required.

REFERENCES – ENERGY CONSUMPTION

Orange County Sanitation District (OCSD), *Strategic Plan, Volume 4*, Chapter 12

OCSD, *Operations and Maintenance Annual Report*, 1998

Carnahan, Pat, OCSD Safety Department, personal communication, 22 April, 1999.

6.11 CUMULATIVE IMPACTS

6.11.1 LEGAL REQUIREMENTS

State California Environmental Quality Act (CEQA) Guidelines require that the cumulative impacts of a proposed project be addressed in the EIR when cumulative impacts are expected to be significant. Cumulative impacts are impacts on the environment that result from the incremental impacts of a proposed action when added to other past, present, and reasonably foreseeable future actions. Such impacts can result from individually minor but collectively significant actions taking place over a period of time.

Section 15130 of the CEQA Guidelines states that the discussion of cumulative impacts need not provide as much detail as the discussion of effects attributable to the project alone. The level of detail should be guided by what is practical and reasonable.

6.11.2 APPROACH TO ANALYSIS

According to CEQA Guidelines Sections 15130(a) and (b), the purpose of this section is to provide a discussion of significant cumulative impacts resulting from the treatment systems improvements in combination with other projects or conditions, and to indicate the severity of the impacts and their likelihood of occurrence. The CEQA Guidelines require that EIRs discuss the cumulative impacts of a project when the project's incremental effect is "cumulatively considerable," meaning that the project's incremental effects are considerable when viewed in connection with effects of past, current, and probable future projects. The discussion of cumulative impacts should include:

(1) Either: (A), a list of past, present, and probable future projects producing related or cumulative impacts; or (B), a summary of projections contained in an adopted general plan or similar document, or in a adopted or certified environmental document, which describes or evaluated conditions contributing to a cumulative impact;

(2) A discussion of the geographic scope of the area affected by the cumulative effect;

(3) A summary of expected environmental effects to be produced by these projects; and,

(4) Reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects.

This analysis relies on a list of projects that are current and reasonably foreseeable and that could have cumulative effects in combination with the OCSD collection system projects.

6.11.3 IMPACTS AND MITIGATION MEASURES

Impact 6.11-1: Cumulative impacts to air quality and noise could occur as a result of treatment facility construction activities coupled with the construction of the GWR System treatment facilities. Significant, unavoidable.

During construction of the proposed treatment facilities at both plant sites, air emissions are expected to create significant unavoidable impacts to the regional air basin (see Section 6.5). Noise and vibration impacts associated with pile driving and construction activities could also be compounded if several construction projects are occurring simultaneously in the Reclamation Plant No. 1 area. These construction impacts are anticipated to be short-term. Mitigation measures to reduce noise and air impacts are provided in previous sections. Projects planned adjacent to the treatment plant sites including the construction of tertiary treatment facilities for the GWR System project could contribute to the local air and noise impacts. The District is unaware of other significant construction projects planned for the vicinity of either treatment plant in the next five years. The surrounding areas are generally fully developed, primarily as low-density residential. Some open space wetlands exist near Treatment Plant No. 1. **Figures 7.1-1** and **7.1-2** in the following chapter show land uses near the two plants.

District-Proposed Mitigation

> **Measure 6.11-1a:** Coordinate construction activities with OCWD to minimize PM_{10} emissions, construction vehicle exhaust, and cumulative noise impacts during excavation and pile driving activities.

Significance after Mitigation: Significant, unavoidable

CHAPTER 7

COLLECTION SYSTEM SETTING, IMPACTS, AND MITIGATION

CHAPTER 7.0
COLLECTION SYSTEM SETTING, IMPACTS AND MITIGATION

7.1 LAND USE

7.1.1 SETTING

The following discussion provides a description of existing land uses adjacent to proposed pipeline replacement projects, which are located in public streets. The OCSD Service Area contains over 400 miles of sewer pipelines serving 23 cities. OCSD is planning sewer pipelines replacements for a total of 47 miles within 14 of these cities. There are 32 district pipeline replacement projects (see **Table 3-19** in Chapter 3.0). The 12 trunk sewer systems are 1) Santa Ana River Interceptor; 2) Euclid; 3) Newhope-Placentia; 4) Knott Interceptor; 5) Baker-Main; 6) Gisler-Redhill; 7) Bushard; 8) Coast; 9) Miller-Holder; 10) Newport, 11) Santa Ana-Dyer, and 12) Sunflower. Of these twelve trunk sewer systems, seven (listed 1-7 above) have planned replacement projects. Pipeline improvements would occur in the cities of Anaheim, Yorba Linda, Orange, Placentia, Fullerton, Fountain Valley, Westminster, Seal Beach, Huntington Beach, Irvine, Newport Beach, Tustin, Santa Ana and Costa Mesa. Portions of the pipeline systems are also located in unincorporated areas that fall within the jurisdiction of Orange County.

In addition to pipeline replacement, the proposed project would also include 19 manhole rehabilitation projects. These projects would occur throughout the Service Area and would consist of minor improvements to existing manholes.

The Service Area is primarily urbanized, consisting of residential, commercial and light industrial uses. Recreational, agricultural and open space uses are also scattered throughout the Service Area. **Maps A1 through A12** in the Map Appendix show the detailed location of proposed replacement pipeline projects and surrounding land uses. **Map B1** in the Map Appendix shows future land uses for the Service Area.

The existing sewers generally follow city street easements and pass by many sensitive land uses common to metropolitan areas including schools, churches, hospitals, residential areas and other uses that are considered particularly sensitive to project construction impacts, such as noise, dust, and traffic and access disturbance.

ESA conducted a land use survey of the proposed projects and the surrounding areas in March 1999. Land uses and sensitive receptors existing along the routes were recorded and videotaped during the survey. Land uses and sensitive receptors were generally identified for each segment,

not for their specific location within a segment. Exact locations of the proposed pipeline improvements are provided in **Table 3-19** in the Project Description.

REGULATORY ENVIRONMENT

The 32 proposed pipeline replacement projects would occur within developed city streets throughout Orange County. Therefore, the proposed projects would be subject to the local plans and policies of the 14 cities and Orange County that cover the collections system. The General Plans for each jurisdiction contain goals, policies and implementation measures, that, together with land use designations and zoning codes, are designed to guide land use and resource planning and development.

7.1.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERA

The land use analysis evaluates the consistency of the project with the type and intensities of land uses existing and proposed on and near the site. The CEQA *Guidelines* establishes that a project would normally have a significant effect on existing land uses if it would: 1) physically divide an established community; 2) conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance; 3) conflict with any applicable habitat conservation plan or natural community conservation plan.

As the proposed project consists of improving existing pipelines, the land use discussion focuses on construction impacts. The pipelines are currently in operation. Wastewater flow would be diverted around project areas during construction.

The proposed projects were also evaluated for compatibility with existing and approved land uses near the project sites, current zoning and general plan designations for the site, and for consistency with applicable plans and policies.

CONSTRUCTION

Impact 7.1-1: Construction activities associated with the trunk sewer systems would involve the rehabilitation and replacement of existing pipelines. Construction activities would result in short-term disturbance of adjacent land uses. Less than Significant with Mitigation Measures.

For the replacement of pipelines (worse case scenario), the construction process involves trench excavation, and removal and replacement of the sewer pipelines. Jack and bore methods may be used for the crossing of flood control channels and select intersections. The use of heavy equipment in construction would result in community disruption impacts, including the generation of noise, dust, construction traffic, and the disruption of streets and access to adjacent

land uses. Sensitive receptors (e.g. residences, hospitals, fire stations, schools, parks, and churches), would be most affected.

As indicated in **Chapter 3.0**, Project Description, the pace of work for pipeline replacement projects is estimated to average 50 to 100 feet per day per crew. The length of time that active construction work is immediately in front of a property (assuming, for example, a 100-foot lot line) will likely be three to five days. Construction activity will occur within one block of a given property for about three to four weeks, on average. Construction activities within residential districts will be limited to weekdays during daylight hours, or as specified in encroachment permits with the County, cities, and other responsible agencies.

Noise and dust would affect people in residential neighborhoods, parks, hospitals, schools, and churches. Access disruption could occur for hospitals, fire stations, businesses, and residents. However, land use disturbance is considered a significant but mitigable impact due to the limited duration and extent of construction. In addition, construction during specified daylight hours would further reduce impacts. With proper mitigation, temporary construction impacts would have a less-than-significant effect on adjacent land uses. Impacts resulting from construction traffic, noise and air quality are discussed in Sections 6.2, 6.4, and 6.5.

The existing seven trunk sewer systems are located within existing streets in primarily urbanized areas with residential, commercial and light industrial land uses. Residential uses occur along all projects alignments except for the Campus Drive Subtrunk Improvements (Projects 24 and 31) and the Armstrong Subtrunk (Project 7-27) (see **Maps A1** through **A12** and description below). Other sensitive receptors (such as schools, hospitals, nursing homes, fire stations, and churches) occur adjacent to Projects 1, 2, 3, 5, 6, 9, 11, 18A, 18B, 23, 25, 26, 29, and 30 (see **Maps A1** through **A12** and description below). A description of the land uses and sensitive receptors for the seven trunk sewer systems are described below.

SANTA ANA RIVER TRUNK SEWER SYSTEM

Santa Ana River Interceptor Relief-A (Project No. 20)

The Santa Ana River Interceptor Relief-A project would occur within La Palma Avenue and Grove Street in the City of Anaheim (see **Map A3** in the Map Appendix). Land uses along La Palma Avenue consist of mostly commercial and light industrial uses. Offices and commercial developments are situated along the street. The Santa Ana River and the Santa Ana River Lakes are located less than one mile south of La Palma Avenue. A metro link station is located west of Jefferson Street. The proposed construction would traverse the railroad spur. The Riverside Freeway (91) is located east of the Santa Ana River less than one mile away. There are no sensitive receptors along this alignment.

Santa Ana River Interceptor Relief-B (Project No. 25)

The Santa Ana River Interceptor Relief-B project would occur within Ranch Parkway and Weir Canyon in the City of Yorba Linda and then continue under La Palma Avenue in the City of

Anaheim (see **Map A4** in the Map Appendix). Land uses include residential, commercial and light industrial uses. Office buildings and auto dealership uses exist along La Palma Avenue. Identified sensitive receptors include both single- and multi-family dwellings and one church. The Yorba Regional Park and the Anaheim Wetlands Park are located in the vicinity of Ranch Parkway.

Taft Branch Improvements (Project No.2)

The Taft Branch Improvements would occur within Meats Avenue, Tustin Avenue and Taft/Candelwood Avenue in the City of Orange (see **Map A3** in the Map Appendix). Land uses along the route include residences and institutions. Identified sensitive receptors include a pre-school, three churches and a mobile home park. Single- and multi-family dwellings are also located along the streets.

Carbon Canyon Dam Trunk Improvements (Project No. 4)

The Carbon Canyon Dam Trunk Improvements project would occur within Rose Drive in the Cities of Placentia and Yorba Linda (see **Map A5** in the Map Appendix). Land uses along the route include commercial and residential uses. Agricultural uses (strawberry fields) are also located in the immediate vicinity. A California State Department of Motor Vehicles (DMV) office is located at the northern end of the project site. Identified sensitive receptors located in the area include two churches, two schools, and single-family residences.

Atwood Subtrunk Improvements (Project Nos. 8, 21)

The Atwood Subtrunk Improvements project would occur within Orangethorpe Avenue in the Cities of Anaheim and Placentia (see **Map A5** in the Map Appendix). Land uses along the route include commercial, light industrial and residential uses. Identified sensitive receptors include single- and multi-family residences.

Lower Santa Ana River Interceptor (SARI) Improvements (Project No. 27)

The Lower SARI Improvements project would occur along the Santa Ana River in the Cities of Anaheim and Orange (see **Map A3** in the Map Appendix). The Santa Ana River runs along the northern edge of the project site for approximately three miles. Identified sensitive receptors include single-family residential uses.

EUCLID TRUNK SEWER SYSTEM

Fullerton Purchase Improvements (Project No. 10)

The Fullerton Purchase Improvements project would occur within Bastanchury Road in the City of Fullerton (see **Map A6** in the Map Appendix). Land uses along the route include residential and open space. Identified sensitive receptors include single-family residences. The Panorama Vista Nature Park Reserve and the Rolling Hills Park are located in the immediate vicinity of the project site.

Euclid Relief Improvements-A (Project No. 14)

The Euclid Relief Improvement-A project would occur within Euclid Street in the City of Fountain Valley (see **Map A7** in the Map Appendix). Land uses along the route include recreational, commercial and residential. Mile Square Park is located west of Euclid Street. Office uses and agricultural uses are located in the vicinity of the project site. Identified sensitive receptors include single-family residences, Mile Square Park, and the Fountain Valley Regional Hospital.

Euclid Relief Improvements-B (Project No. 29)

The Euclid Relief Improvement-B project would occur within Euclid Street in the City of Fountain Valley (see **Map A7** in the Map Appendix). Residential and light industrial land uses surround the project site. A small area of agricultural land is also located in the project vicinity. Sensitive receptors include a church and single-family residences.

NEWHOPE-PLACENTIA TRUNK REPLACEMENT

Newhope-Placentia Trunk Replacement (Project No. 18-A)

The Newhope-Placentia Trunk Replacement project would occur within State College Boulevard in the Cities of Orange and Anaheim (see **Map A6** in the Map Appendix). Land uses include light industrial and commercial. Anaheim Stadium is located east of State College Boulevard. A veterinarian hospital, Boysen Park, and a post office are also located along the route. Identified sensitive receptors include single- and multi-family residences, one school, two parks, and three churches

Cypress Avenue Trunk Replacement (Project No. 18-B)

The Cypress Avenue Trunk Replacement project would occur within Yorba Linda Road and State College Boulevard in the City of Fullerton north of La Palma Avenue (see **Map A6** in the Map Appendix). Land uses include institutional, commercial and light industrial uses. California State University Fullerton is located in the project vicinity. Identified sensitive receptors in the area include a mobile home park, medical/dental center, La Vista High School, one fire station, and two churches. Single- and multi-family residences are also located nearby.

KNOTT TRUNK SEWER SYSTEM

Hoover Feeder Improvements (Project No. 16)

The Hoover Feeder Trunk Improvement project would occur within Trask Avenue in the City of Westminster (see **Map A8** in the Map Appendix). Residential uses along with scattered commercial/retail uses surround the project site. Identified sensitive receptors include single- and multi-family residential uses.

West Side Relief Interceptor Improvements (Project No. 23)

The West Side Relief Interceptor Improvements project would occur within Seal Beach Boulevard in the cities of Seal Beach and Los Alamitos (see **Map A9** in the Map Appendix). Land uses in the surrounding area include commercial and residential. Office uses and a golf course are also located in the project vicinity. The Armed Forces Reserve Center is located to the east of the project site. Identified sensitive receptors in the area include single- and multi-family residences, two churches and a nursing home.

Warner Avenue Relief Sewer (Project Nos. 17, 28)

The Warner Avenue Relief Sewer project would occur within Los Patos Avenue and Warner Avenue in the City of Huntington Beach (see **Map A10** in the Map Appendix). Land uses in the vicinity include the Bolsa Chica Ecological Reserve and residential uses. Single-family residences are located north of Los Patos Avenue. The Meadowlark Golf Course is located north of Warner Avenue.

Edinger/Bolsa Chica Trunk Improvements (Project No. 30)

The Edinger/Bolsa Chica Trunk Improvements project would be located within Edinger Street in the City of Huntington Beach (see **Map A10** in the Map Appendix). Land uses consist of mostly residential and light industrial. The U.S. Naval Weapons Station is located to the immediate west. Marina Community Park, Marina High School and single-family residences are sensitive receptors located in the project vicinity.

BAKER-MAIN TRUNK SEWER SYSTEM

Campus Drive Subtrunk Improvements (Project Nos. 31, 24)

The Campus Drive Subtrunk Improvements project would occur within Campus Drive in the Cities of Irvine and Newport Beach (see **Map A2** in the Map Appendix). Land uses in the project area include John Wayne Airport and office/commercial uses. There are no identified sensitive receptors adjacent to these projects.

Fairview Relief Sewer (Project No. 3)

The Fairview Relief Sewer project would occur within Fairview Road in the City of Costa Mesa (see **Map A2** in the Map Appendix). Land uses in the project vicinity include commercial, residential and institutional uses. Orange Coast College, Costa Mesa High School, and Southern California College are located in the immediate vicinity. Additionally, the Orange County Fairgrounds and the Pacific Amphitheatre are located east of Fairview Road. Nearby sensitive receptors include single- and multi-family residences and a nursing home.

GISLER-REDHILL TRUNK SEWER SYTEM

Gisler-Redhill/North Trunk Improvements (Project No. 6)

The Gisler-Redhill/North Trunk Improvements project would occur within Prospect Avenue, Main Street and El Camino Real in the City of Tustin (see **Map A11** in the Map Appendix). Surrounding land uses consist of residential and commercial/office uses. Sensitive receptors in the area include single-family residences, three churches, a pre-school and junior high school. Also, the Columbus Tustin Park and the Peppertree Park are located nearby.

Gisler-Redhill System Improvements-A (Project No. 9)

The Gisler-Redhill System Improvements-A project would occur within Arroyo Avenue, Skyline, and Redhill Avenue in the City of Tustin and in the County of Orange (see **Map A11** in the Map Appendix). Surrounding land uses consist of residential and commercial uses. Identified sensitive receptors in the area include single- and multi-family residences, Pine Tree Park, five churches and Tustin High School.

Gisler-Redhill System Improvements-B (Project No. 22, 13, 32)

The Gisler-Redhill System Improvements-B project would occur within Redhill Avenue in the Cities of Tustin and Santa Ana (see **Map A11** in the Map Appendix). Land uses in the project vicinity include mostly residential and commercial uses. Light Industrial and agricultural uses are scattered along the project route. The former U.S. Marine Corps Air Station is located east of Red Hill Avenue. In addition to single- and multi-family residences, other sensitive receptors in the project vicinity include the A.G. Curry Middle School and Navy housing units.

Tustin Trunk Improvements (Project Nos. 12, 19, 11)

The Tustin Trunk Improvements project would occur within Cowan Heights Drive, Newport Avenue and Irvine Boulevard in the City of Tustin and in unincorporated areas of the County of Orange (see **Map A11** in the Map Appendix). Land uses in the project vicinity consist of residential and commercial uses. Sensitive receptors located in the area include single- and multi-family residences, three churches and three schools, including Foothill High School.

Orange Trunk Improvements (Project No. 5)

The Orange Trunk Improvements project would occur within Hewes Avenue, Vanderlip Avenue and Holt Avenue in the County of Orange (see **Map A11** in the Map Appendix). Surrounding land uses include residential uses. Single- and multi-family residences and Hewes Middle School are sensitive receptors located in the project vicinity.

Orange Park Acres Trunk Replacement (Project No.7)

The Orange Park Acres Trunk Replacement project would occur within Santiago Canyon Road in the City of Orange (see **Map A3** in the Map Appendix). Land uses in the area include residential

and recreational uses. An equestrian center is located in the immediate area. Identified sensitive receptors in the project vicinity include single-family residences, a school and a church.

West Trunk Improvements (Project No. 26)

The West Trunk Improvements project is located east of Prentica Park between 1st Street and West Main Street in the City of Santa Ana (see **Map A11** in the Map Appendix). Commercial/office uses are located in the surrounding area. A day care/elementary school is also located in the immediate area.

Armstrong Subtrunk (Project No. 7-27)

The Armstrong Subtrunk project would occur within Armstrong and Gillete in the City of Irvine (see **Map A12** in the Map Appendix). Land uses in the area include light industrial uses. John Wayne Airport and an industrial park are located in the project vicinity. Sensitive receptors include a fire station. The route traverses an active railroad spur.

INTERPLANT/JOINT WORKS

Bushard Trunk Improvement (Project No. 1)

The Bushard Trunk Improvement project would occur within Bushard Street in the Cities of Fountain Valley and Huntington Beach (see **Map A1** in the Map Appendix). The surrounding land use is primarily residential, with scattered commercial/retail uses. Single- and multi-family residences, a park, a fire station, and a nursing home are sensitive receptors located along Bushard Street. The proposed pipeline would require jack and boring under residential areas just west of the terminus at Treatment Plant No. 2.

District-Proposed Mitigation

Measure 7.1-1a: The District will comply with local ordinances and restrict construction activities to daylight hours or as specified in encroachment permits.

EIR-Identified Mitigation

Measure 7.1-1b: The District should provide notices of construction activities to adjacent property owners and provide a contact and phone number of a District staff person to be contacted regarding questions or concerns about construction activity.

Measure 7.1-1c: The District should coordinate with officials of adjacent fire station and the Fountain Valley Regional Hospital as well as other hospitals to ensure that 24-hour emergency access is available.

Measure 7.1-1d: To minimize disruption of access to driveways to adjacent land uses, the District or its contractor(s) should maintain steel-trench plates at the construction sites to restore access across open trenches. Construction trenches in streets will not be left open after work hours.

Measure 7.1-1e: The District should provide temporary signage indicating that businesses are open.

Significance after Mitigation: Implementation of the above mitigation measures and those presented in Sections 6.2, 6.4, and 6.5 would ensure that impacts are reduced to a less-than-significant level.

OPERATION

Impact 7.1-2: Operation of the proposed pipelines would not alter existing land uses of the individual project sites. This would not divide the established communities nor would it conflict with applicable local land use plans and policies. No impact.

Land uses of the individual project sites would not be altered under the proposed project. The proposed project would improve existing pipelines and would not divide the established community. Operation of the project would not disrupt surrounding land uses. Similar to the existing collections system, under the proposed project, the continued operation of the trunk sewer systems would conform to applicable zoning and land use plans and policies.

Mitigation Measure

No mitigation measures are required.

REFERENCES – LAND USE

Environmental Science Associates, Site Surveys on March 23, and March 29, 1999.

Fountain Valley, City of, 1993. *The Sanitation District Plant No. 1 Specific Plan.* 1993.

Fountain Valley, City of, 1995. *City of Fountain Valley General Plan.* 1993.

Fountain Valley, City of, 1993. *City of Fountain Valley Zoning Ordinance.* 1993.

Huntington Beach, City of, 1996. *City of Huntington Beach General Plan.* 1996

Carvalho, Wayne. City of Huntington Beach Planning Department, Telephone communication, April 12, 1999.

Gallardo, Maria. City of Fountain Valley Planning Department, Telephone communication, April 21, 1999.

7.2 TRAFFIC

7.2.1 SETTING

The various collection improvements proposed as part of the Strategic Plan follow alignments primarily along approximately 47 miles of existing public streets and highways. The alignments also sometimes cross or parallel existing or planned bikeways. The following discussion lists the public streets and highways within the alignments of the proposed sewer improvements, along with a discussion of roadway geometries and traffic control. **Table 7.2-1** identifies the streets affected by each of the proposed pipeline projects and summarizes key traffic circulation information including the number of travel lanes, street size/designation (arterial, collector, or local), and traffic signs. The street, traffic, and transit setting for each of the pipeline projects is described below, under Impact 7.2-1.

7.2.2 IMPACTS AND MITIGATION MEASURES

Impact 7.2-1: Construction activities during trenching in city streets will impact traffic circulation during construction period. Less than Significant with Mitigation Measures.

Impacts to the circulation routes will be short-term, related to the construction activities involved in installing the proposed relief facilities. Upon completion of each construction project, the affected roadways and trails will be restored to fully operable conditions and there will be no long-term effects to these circulation routes.

Installation of many of the facilities referred to above will involve the excavation of a portion of the affected roadways, utilizing open trench construction (which is the least expensive) in most cases. For the open trench method, trench widths will range from 4 to 16 feet in width, depending on the size of the sewer being replaced. The active work area will extend about five to 10 feet to one side of the trench and 20 to 30 feet on the other side allowing for construction. Jacking and boring construction will be used at critical street and intersection locations. The operation requires a jacking pit that is approximately 50 feet by 20 feet is width. This will result in the closure of one or more traffic lanes at a time, depending on whether a sewer is laid along the edge or down the middle of a street and on the width of a street section in a particular construction zone. In some cases, access to private properties may be temporarily reduced, while construction progresses in sequence along each affected roadway.

Many of the proposed improvements involve rehabilitation of existing sewers. In some of these cases, the work will be performed inside the sewer, through techniques such as 'slip-lining', which will avoid any surface trenching, except for occasional manhole repair. Roadways in these areas would thus suffer little or no disruption. Manhole repair will occur in many areas, resulting in temporary and very localized disruption to traffic along the affected street.

TABLE 7.2-1
SUMMARY OF TRAFFIC ELEMENTS FOR PIPELINE REPLACEMENT PROJECTS

Trunk Sewer System	Project No.	Street	City	Completion Date	Cross Streets		# of lanes (a)	Street Type	Traffic Signs	Bike Lane	Turning Lane	Street Impact	Cultural Impact Probability
SANTA ANA RIVER TRUNK SEWER SYSTEM													
Santa Ana River Interceptor Relief - A	20	La Palma	Anaheim	2005	Kellog Dr.	Fee Ana St.	3	arterial	signal			Various lane closures	Very high
					Fee Ana St.	Hawk Cir.	3	arterial	signal				
					Hawk Cir.	W/O Tustin Ave.	3	arterial	signal				
		La Palma/Grove St.			W/O Tustin Ave..	Grove St.	1	arterial	signal				
Santa Ana River Interceptor Relief - B	25	Savi Ranch Pkwy	Anaheim, Yorba Linda	2010	W/O Auto Plaza Cir.	W/O Mirage St.	1	collector	signal			Various lane closures; bus impact	Very high
		La Palma & Weir Canyon			W/O Mirage St.	W/O Weir Cyn Rd.	1	collector	signal				
		La Palma	Anaheim		N/O Tippets Ln.	W/O Agnes Dr.	2	collector	signal				
					W/O Agnes Dr.	W/O Chrisden St.	2	collector	signal				
					W/O Chrisden St.	Imperial Hwy.	3	arterial	signal				
					Imperial Hwy.	E/O Brasher St.	3	arterial	signal				
					E/O Brasher St.	Kellog Dr.	3	arterial	signal				
Taft Branch Improvements	2	Meats Ave.	Orange	2005	Santiago Rd.	E/O Tustin St.	1,2	collector	signal			Various localized lane closures; bus impact	Moderate
		Taft & Tustin Ave.			S/O Meats Ave.	E/O Glassel	3,2		signal		yes		
Carbon Canyon Dam Trunk Improvements	4	Rose Drive	Placentia/ Yorba Linda/ Brea	2005	N/O Blake Rd.	Imperial Hwy.	2	arterial	signal			Various localized lane closures	Moderate
					Imperial Hwy.	S/O Wayburn	2	collector	signal		yes		
					S/O Wayburn	Orange Dr.	2	collector	signal		yes		

TABLE 7.2-1 (Con't)
SUMMARY OF TRAFFIC ELEMENTS FOR PIPELINE REPLACEMENT PROJECTS

Trunk Sewer System	Project No.	Street	City	Completion Date	Cross Streets		# of lanes*	Street Type	Traffic Signs	Bike Lane	Turning Lane	Street Impact	Cultural Impact Probability
					Ave.								
SANTA ANA RIVER TRUNK SEWER SYSTEM (con't)													
					Orange Dr.	S/O Yorba Linda Blvd.	2	collector	signal		yes		
					S/O Yorba Linda Blvd.	Palm Drive							
					Palm Dr.	Carbon Creek, E/O Warren							
Atwood Subtrunk Improvements	8	Orangethorpe Ave.	Anaheim	2005	Via Breve	Kellog Dr.	2	arterial	signal		yes	Various localized lane closures; bus impact	Moderate
	21	Orangethorpe Ave.	Placentia	2005	Fee Ana St.	Richfield Rd.	2	arterial	signal		yes		
Lower SARI Interceptor Improvements	27	Along Grove St. to SCRRA	Anaheim/ Orange/ County of Orange	2015	S/O La Palma Rd.	South side of SAR, E/O Kraemer Blvd.	--	--	signal				Very high
					Kramer Blvd.	Taft Ave.							
					Taft Ave.	S/O Yale Av.							
EUCLID TRUNK SEWER SYSTEM													
Fullerton Purchase Improvements	10	Maple Ave.	Fullerton	2005	Sandalwood Ave.	S/O Bastanchara Rd.	2	arterial	signal			Localized lane closures	Moderate
Euclid Relief Improvements - A	14	Euclid	Fountain Valley	2005	Edinger Ave.	Slater Ave.	2	arterial	signal			Localized lane closures; bus impact	Low
Euclid Relief Improvements - B	29	Euclid	Fountain Valley	2020	Slater Ave.	Reclamation Plant 1	2	arterial	signal		yes	Localized lane closures; bus impact	Low
NEWHOPE-PLACENTIA TRUNK SEWER SYSTEM													
Newhope-Placentia Trunk Replacement	18-A	State College Blvd.	Anaheim	2005	La Palma Rd.	Cerritos Ave..	3,2	arterial	signal			Bus impact	Moderate
			Anaheim, Orange		Cerritos Ave.	Orangewood Ave.	4,3	arterial	signal				
Cypress Avenue Trunk Replacement	18-B	Yorba Linda Rd.	Fullerton	2005	Associated Rd.	Almira Ave.	3	arterial	signal			Various localized lane closures; bus impact	Moderate

TABLE 7.2-1 (Con't)
SUMMARY OF TRAFFIC ELEMENTS FOR PIPELINE REPLACEMENT PROJECTS

Trunk Sewer System	Project No.	Street	City	Com-pletion Date	Cross Streets		# of lanes*	Street Type	Traffic Signs	Bike Lane	Turning Lane	Street Impact	Cultural Impact Probability
		State College Blvd			Almira Ave..	N/O Gymnasium Campus Dr.	3	arterial	signal				
NEWHOPE-PLACENTIA TRUNK SEWER SYSTEM (con't)													
					N/O Gymnasium Campus Dr.	N/O Kimberly Ave.	2	arterial	signal				
			Fullerton/ Anaheim		N/O Kimberly Ave.	La Palma Rd.	2	arterial	signal				
KNOTT TRUNK SEWER SYSTEM													
Hoover Feeder Improvements	16	Trask Ave.	West-minster	2020	W/O Beach Blvd.	Hoover St.	2	collector	Signal			Localized lane closures	Moderate
West Side Relief Interceptor Improvements	23	Seal Beach Blvd/	Seal Beach/ Los Alamitos	2010	Farquaher Ave.	N/O Bradbury Rd.	3	arterial	signal	yes		Bus impact	High
					N/O Bradbury Rd.	S/O Lampson Av.	3	arterial	signal		yes		
					S/O Lampson Ave.	S/O Silver Fox Rd.	2	arterial	signal		yes		
Warner Avenue Relief Sewer	17/18	Los Patos Ave	Hunting-ton Beach/ County of Orange	2005/2015	Marine View Place	Bolsa Chica St.	1	re-sidential	stop signs			Various localized lane closures	Very high
		Warner Ave.			Graham St.	Kern Dr.	3	arterial	signal	yes	yes		
					Kern Dr.	Spingdale St.	3	arterial	signal	yes	yes		
Edinger/Bolsa Chica Trunk Improvements	30	Edinger Ave.	Hunting-ton Beach	2020	E/O Bolsa Chica St.	Hummingbird Ln.	2	arterial	signal		yes	Various localized lane closures	Low
		Edinger Ave.			Graham St.	Clubhouse Ln.	2	arterial	signal	yes			
BAKER-MAIN TRUNK SEWER SYSTEM													
Campus Drive Subtrunk Improvements	31	Campus Drive	Irvine/ Newport	2020	Von Karman	Macarthur.	3,2	arterial	signal			Various localized lane	Low

TABLE 7.2-1 (Con't)
SUMMARY OF TRAFFIC ELEMENTS FOR PIPELINE REPLACEMENT PROJECTS

Trunk Sewer System	Project No.	Street	City	Completion Date	Cross Streets		# of lanes*	Street Type	Traffic Signs	Bike Lane	Turning Lane	Street Impact	Cultural Impact Probability
			Beach									closures; bus impact	
BAKER-MAIN TRUNK SEWER SYSTEM (con't)													
					W/O Macarther Blvd.	W/O Campus Dr.							
	24	Campus Drive	Irvine/Newport Beach	2010	Macarthur	W/O Macarthur Dr.	3,2	arterial	signal			Various localized lane closures; bus impact	Low
Fairview Relief Sewer	3	Fairview Street	Costa Mesa	2005	Village Way	Wilson St.	4,3	arterial	signal	yes	yes	Localized lane closures; bus impact	Low
GISLER-REDHILL TRUNK SEWER SYSTEM													
Gisler-Redhill/North Trunk Improvements	6	Prospect	Tustin, Orange County		S/O Chapman	Irvine Blvd.	1	re-sidential	stop signs		yes	Potential street closures	Moderate
					S/O Irvine Blvd.	E. Main St.							
		Main St.	Tustin		W/O Prospect	El Camino	1	arterial	signal				
		El Camino Real	Tustin		E. Mains St.	El Camino Way	1	arterial	signal				
					El Camino Real	W/O I-5							
Armstrong Subtrunk Sewer	N/A	Armstrong	Irvine, Tustin	2005	Barrance	Alton Pkwy	1	Light indust	Signal				Moderate
		Alton Pkwy			Armstrong	S/O Alton Pkwy	1	Light indust	Signal				
		Armstrong			Alton Pkwy	Macarthur Blvd	1	Light indust	Stop signs				
					Armstrong	Main St.	1	Light indust	Stop signs				

TABLE 7.2-1 (Con't)
SUMMARY OF TRAFFIC ELEMENTS FOR PIPELINE REPLACEMENT PROJECTS

Trunk Sewer System	Project No.	Street	City	Completion Date	Cross Streets		# of lanes*	Street Type	Traffic Signs	Bike Lane	Turning Lane	Street Impact	Cultural Impact Probability
Gisler-Redhill System Improvements - A	9	Arroyo Ave.	County of Orange	2005	Loma Drive	S/O Skyline Dr.	1	re-sidential	stop signs				Very High
GISLER-REDHILL TRUNK SEWER SYSTEM (con't)													
		Skyline	Tustin		Arroyo Way	Redhill Ave.	1	re-sidential	stop signs				
	9	Redhill Ave.	Tustin	2005	Irvine Blvd	Mitchell Ave.	3,1	arterial	signal		yes		
Gisler-Redhill System Improvements - B	22	Redhill Blvd	Tustin	2005	Mitchell Ave.	Edinger Ave.	3	arterial	signal	yes	yes	Localized lane closures; bus impact	Very high
	13	Redhill Blvd	Tustin	2005	Edinger Ave.	N/O Industrial Pkwy	3	arterial	signal	yes			
			Tustin/ Santa Ana		Industrial Pkwy	Carnegie Ave.	3	arterial	signal	yes			
	32	Redhill Blvd	Tustin/Santa Ana/Irvine	2020	Carnegie Ave.	Deere Ave.	3	arterial	signal	yes			
Tustin Trunk Improvements	12	Cowan Heights	County of Orange	2005	Shady Ridge Dr.	Newport Blvd.	1	re-sidential	stop signs			Various localized lane closures and street closures	Moderate
	19	Newport Ave	County of Orange	2005	Crawford Canyon Rd.	Castlegate Ln.	1,2	arterial	signal	yes	yes		
					Castlegate Ln.	Skyline Dr.	1,2	arterial	signal	yes	yes		
					Skyline Dr.	Redhill Av.	1,2	arterial	signal	yes	yes		
	11	Irvine Blvd	Tustin/ Orange County	2005	Newport Blvd	Redhill Ave.	4	arterial	signal				
		Newport Ave		2005	Irvine Blvd	Castlegate Ln.	2	arterial	signal		yes		
Orange Trunk Improvements	5	Hewes	County of Orange	2005	Fairhaven Ave.	17th St.	2	re-sidential	stop signs			Various localized lane closures and street closure	Moderate
		Vanderlip			Hewes	W/O Esplanade	1	re-sidential	stop signs				
		Holt			S/O Bigelow	Newport Blvd.	2	arterial	signal				
Orange Park Acres Trunk Replacement	7	Santiago Canyon Road	Orange	2005	Randall	Jamestown	2	arterial	signal	yes		Localized lane closure	Moderate

TABLE 7.2-1 (Con't)
SUMMARY OF TRAFFIC ELEMENTS FOR PIPELINE REPLACEMENT PROJECTS

Trunk Sewer System	Project No.	Street	City	Com-pletion Date	Cross Streets		# of lanes*	Street Type	Traffic Signs	Bike Lane	Turning Lane	Street Impact	Cultural Impact Probability
West Trunk Improvements	26	E/O Prentica Park	Santa Ana	2010	E/O 1st St.	N/O West Main St.	1	collector	stop signs				Moderate
INTERPLANT													
Bushard Trunk Improvement	N/A	Bushard	Fountain Valley	2005	Ellis Ave.	Garfield Ave.	2	arterial	signal	yes	yes		Low
			Huntington Beach		Garfield Ave.	Brookhurst St.	2	arterial	signal	yes	yes		

Legend:
N/O – North of; S/O – South of; W/O – West of; E/O – East of
/a/ Number of lanes per direction

Removed pavement and excavated soil will be hauled off for disposal. Imported backfill will be hauled to stockpiles near the open trench and ultimately used to fill the trench. It has been estimated that project work occurring from the present to the year 2020 will result in 102,691 truck trips to remove soil and a similar number of trips to bring construction materials and backfill material. In order to calculate VMT per year for trucks removing excavated material and delivering backfill, it was assumed that that average trip length was 50 miles and the work occurs at a constant level between the base year (year 2000) and 2020. Hauling of excavated material and backfill material will add 513,455 VMT per year.

It is anticipated that pipeline rehabilitation projects will be performed by ten-man work crews. The pace of typical projects will allow for 50-100 feet (75 assumed for calculation purposes) of construction work per day. By knowing the length of construction and by assuming that the construction work is performed consistently over a twenty-year period, the average employee drives 50 miles for work and the hauling of construction supplies and equipment and that vehicle occupancy rates are 1.2 occupants per vehicle, it is possible to estimate annual VMT for employee trips. It is estimated that construction worker trips will result in a VMT of 68,900.

Projects involving excavation along streets and highways will create a variety of temporary (short-term) inconveniences and nuisances to commuters using those circulation routes. Increased travel times, greater traffic congestion, heavier traffic on detour routes and safety hazards due to the operation and storage of construction equipment and materials are examples of the difficulties which will affect motorists, bicyclists and pedestrians along affected travel routes.

The setting and impacts for each project area is described below.

SANTA ANA RIVER TRUNK SEWER SYSTEM

Santa Ana River Interceptor Relief –A

This project runs along La Palma Avenue from Kellogg Drive to the west and Grove Street to the east. This segment is approximately 11,000 feet in length and is located within the City of Anaheim. Between Kellogg Drive and Tustin Avenue, the roadway primarily carries six lanes of through traffic and is an arterial highway bounded by commercial and industrial land uses. All major intersections are signalized and there is a striped bicycle lane on portions of the roadway.

Lakeview Avenue, Richfield Road and Tustin Avenue are major north-south streets that intersect La Palma Avenue within the project limits. The jack-and-bore construction method may be required at these locations to minimize traffic circulation impacts. It is anticipated that the proposed sewer pipeline projects would require lane closures during work periods. The roadway width should allow for the maintenance of traffic around work areas. Provisions must be made to maintain access to the adjacent commercial and industrial land uses during construction.

OCTA Bus Routes 69, 410 and 411 utilize this section of roadway. Routes 410 and 411 serve the Anaheim Canyon Metrolink Station located to the west.

Santa Ana River Interceptor Relief – B

This project is planned for Savi Ranch Parkway and Weir Canyon Road within the City of Yorba Linda and along La Palma Avenue within the City of Anaheim. Construction is planned for approximately 4,000 feet along Savi Ranch Parkway between Auto Plaza Center to the east and Weir Canyon Road to the west. Savi Ranch Parkway is a two-lane roadway with traffic signals at major intersections. Due to the width of the roadway, street closures may be required during construction. Traffic could be diverted to adjacent roadways including Eastpark Drive, Old Canal Road, Oakcrest Circle and Mirage Street. Access should be maintained to commercial properties located along Savi Ranch Parkway. Construction along this segment of roadway is not expected to impact bus transit.

Construction is planned for Weir Canyon Road for approximately 1,200 feet between Savi Ranch Parkway and La Palma Road. Weir Canyon Road is a two-lane roadway within the project limits. Due to the width of the roadway, road closures may be required. However, these should be avoided if possible since Weir Canyon Road provides access from the Riverside Freeway (SR-91) and the City of Anaheim to the south and residential areas of Yorba Linda to the north.

Construction along this segment of roadway might impact bus trips from OCTA Routes 38, 38A.

Construction is planned for approximately 11,700 feet along La Palma Avenue between Tippets Lane to the north and Kellogg Drive to the south. La Palma Avenue is a four to six-lane roadway within the project limits. Within the project limits, La Palma Avenue is an arterial roadway passing through residential, commercial and industrial areas. The roadway width should allow for open trench construction along the majority of the project with traffic rerouted through lane closures. The jack-and-bore construction method may be required along the project near Imperial Highway (SR-90).

Construction along this segment of roadway could impact bus trips from OCTA Route 411 that serves the Anaheim Canyon Metrolink Station.

Taft Branch Improvements

The proposed project involves approximately 2,900 feet of roadway along Meats Avenue, 2,500 feet of roadway along Tustin Street and 5,000 feet of roadway along Taft Avenue. This project is located within the City of Orange. The project limits on Meats Avenue are between Santiago Road to the east and Tustin Street to the west. Meats Avenue is a two and four-lane roadway within the project limits and runs through primarily residential neighborhoods. It is anticipated that the roadway has sufficient width to accommodate construction with localized lane closures along the majority of the route. The contractor might need to utilize bore-and-jack construction at the Meats Avenue intersection with Tustin Avenue located at the western project limit.

The project limits on Tustin Street are between Meats Avenue and Taft Avenue. Within these limits, Tustin Street is a four to six-lane roadway. The adjacent land uses are primarily commercial and industrial. It is anticipated that trench construction would be used along most of

this segment of the project with traffic accommodated with localized lane closures. The jack-and-bore construction method may be considered at the Tustin Street/Taft Avenue intersection to minimize traffic impacts.

The project limits on Taft Avenue are between Tustin Avenue and Glassel Street. Taft Avenue is a four to six-lane roadway within the project limits. The roadway runs through a commercial industrial area with minor north-south streets controlled by stop signs. The roadway is of sufficient width to likely accommodate trench construction with traffic rerouted with localized lane closures.

Construction along Meats Avenue may affect OCTA Bus Route 67. Pipeline work along Tustin Avenue may affect OCTA Bus Routes 69 and 373. Construction at the Meats Avenue/Tustin Avenue intersection may affect OCTA Bus Routes 38, 38A, 53, and 53A. Construction along Taft Avenue may impact bust operations on OCTA Bus Routes 59 and 59A.

Carbon Canyon Dam Trunk Improvements

This project is located along Rose Drive within the Cities of Placentia, Yorba Linda and Brea. The project limits are approximately Blake Road to the north and Yorba Linda Boulevard to the south. The project length is approximately 8,000 feet. Within the project limits, Rose Drive is a four-lane roadway with signalized traffic control at major intersections. The adjacent land uses are primarily residential with commercial used located along the southern portion of the project.

Rose Drive is of sufficient width to allow for trench construction methods along most of the project length with traffic controlled with localized lane closures. The jack-an-bore construction might be considered at the Rose Drive intersection with the following east-west roadways: Imperial Highway, Bastanchury Road and Yorba Linda Boulevard.

Impacts to bus transit along this segment of roadway are not anticipated.

Atwood Subtrunk Improvements

This project is located along Orangethorpe Avenue within the Cities of Anaheim and Placentia. The Anaheim portion of the project is approximately 4,400 feet in length and bounded by Imperial Highway to the east and Kellogg Drive to the west. This segment of roadway is four lanes wide and passes through commercial and industrial land uses. It is anticipated that the roadway is of sufficient width to accommodate trench construction methods with traffic primarily controlled with localized lane closures.

The Placentia portion of the project is bounded by Fee Ana Street to the east and Richfield Road to the west. Orangethorpe Avenue is a four-lane roadway within the project limits and bisects a commercial/industrial area. It is anticipated that trench construction methods will be utilized with traffic controlled by localized lane closures.

Project construction could affect OCTA Bus Route 30.

Lower Santa Ana River Interceptor Improvements

This project is located along the Santa Ana River and is not anticipated to impact area roadways.

EUCLID TRUCK SEWER SYSTEM

Fullerton Purchase Improvements

This project is located along approximately 11,000 feet of Euclid Street within the Cities of Fullerton and La Habra. The project is bounded by Sandalwood Avenue to the north and Bastanchary Road to the south. Euclid Street is a four-lane roadway within the project limits and is controlled by traffic signals at larger intersections. It is anticipated that the roadway width can accommodate trench construction with traffic controlled with localized lane closures along the majority of the route. The jack-and-bore construction method may be utilized at the Euclid Street intersections with Rosecrans Avenue and Bastanchary Road.

Construction impacts to OCTA Bus Routes are not anticipated along this segment of roadway.

Euclid Relief Improvements – A and B

This project is located along approximately 13,000 feet of Euclid Street within the City of Fountain Valley. This project is bounded by Edinger Avenue to the north and the Orange County Sanitation District to the south. Euclid Street is a four-lane roadway within the project limits with larger intersections controlled by traffic signals. The roadway traverses commercial and industrial areas. It is anticipated that the roadway width can accommodate trench construction with traffic controlled with localized lane closures along the majority of the route. The jack-and-bore construction method may be utilized at the Euclid Street intersections with Edinger Avenue, Warner Avenue and West MacArthur Boulevard.

Construction along Euclid Street could potentially impact OCTA Bus Route 37.

NEWHOPE-PLACENTIA TRUNK SEWER SYSTEM

Newhope-Placentia Trunk Replacement

This project runs along approximately 18,500 feet of State College Boulevard within the Cities of Anaheim and Orange. The project is bounded by La Palma Road to the north and Orangewood Avenue to the south. The project traverses commercial land uses with the roadway width varying from four to eight lanes. It is anticipated that the roadway width will allow for trench construction. Jack-and-bore construction should be considered at the State College Boulevard intersections with Lincoln Avenue, Ball Road and Katella Avenue.

Construction along State College Boulevard at Orangewood Avenue may affect the east-west OCTA Bus Route 30. Construction along State College Boulevard at Lincoln Avenue may impact the east-west OCTA Bus Route 42. Construction along State College Boulevard at

Katella Avenue may impact the east-west OCTA Bus Route 50. Construction along the length of State College Boulevard may impact the north-south OCTA Bus Lines 49 and 49A.

Cypress Avenue Trunk Replacement

This project runs along approximately 600 feet of Yorba Linda Boulevard and approximately 14,000 feet of State College Boulevard within the Cities of Fullerton and Anaheim.

The Yorba Linda Boulevard portion of the project is approximately 600 feet in length and is bounded by Associated Road to the east and Almira Avenue to the west. Yorba Linda Boulevard is a six-lane roadway within the project limits and traverses a commercial area. It is anticipated that the roadway is of sufficient width to accommodate trench construction with traffic accommodated by localized lane closures.

Construction along this segment of roadway could impact OCTA Bus Route 47.

The State College Boulevard portion of the project is bounded by Almira Avenue to the north and La Palma Road to the south. State College Boulevard is a six-lane roadway north of Gymnasium Campus Drive and a four-lane section to the south. The roadway runs through commercial areas with traffic signals controlling the larger intersections. It is anticipated that the roadway width will allow for trench construction. Jack-and-bore construction should be considered at the State College Boulevard intersections with Yorba Linda Boulevard, Chapman Avenue, Commonwealth Avenue, Orangethorpe Avenue, the SR-91 Interchange and La Palma Avenue to minimize traffic impacts.

Construction along the State College at the Commonwealth Avenue intersection could impact OCTA Bus Route 26. Construction along the entire segment could impact OCTA Bus Routes 49, 49A and 69.

KNOTT TRUNK SEWER SYSTEM

Hoover Feeder Improvements

This project is located along Trask Avenue in the City of Westminster. The Trask Avenue portion of the project is approximately 2,500 feet in length and bounded by Beach Boulevard to the east and Hoover Street to the west. Trask Avenue is a four-lane roadway within the project limits and traverses residential neighborhoods. The roadway width should accommodate trench construction allowing traffic to be controlled with localized lane closures.

Construction impacts to bus transit routes are not anticipated along this section of roadway.

West Side Relief Interceptor Improvements

This project is located along Seal Beach Boulevard in the Cities of Seal Beach and Los Alamitos. The Seal Beach Boulevard portion of the project is approximately 9,500 feet in length and is

bounded by Farquaher Avenue to the north and Silver Fox Road south of Lampson Avenue to the south. The roadway is controlled by traffic signals at larger intersections and traverses residential and commercial areas. Seal Beach Boulevard is a four to six-lane roadway within the project limits and should be of sufficient width to accommodate trench construction.

Construction along this segment of roadway may potentially impact OCTA Bus Routes 42 and 211.

Warner Avenue Relief Sewer

This project is located along Los Patos Avenue and Warner Avenue within the City of Huntington Beach and County of Orange.

The Los Patos Avenue portion of the project is approximately 2,400 feet in length and bounded by Bolsa Chica Street to the east and Marina View Place to the west. Los Patos Avenue is a two-lane roadway within the project limits. Pipeline construction may require the temporary closure of Los Patos Avenue. Access should be maintained for local residents. Through traffic can be detoured to the adjacent residential roadways.

Impacts to bus transit are not anticipated on this section of roadway.

The Warner Avenue portion of the project is approximately is 2,500 feet in length and bounded by Springdale Street on the east and Graham Street on the west. Warner Avenue is a six-lane roadway within the project limits. Warner Avenue traverses residential and mixed-use land areas. The roadway is controlled with signals at larger intersections and is striped to provide a bicycle lane. The roadway width should allow for trench construction with traffic controlled by localized lane closures.

Impacts to bus transit are not anticipated on this section of roadway.

Edinger/Bolsa Chica Trunk Improvements

This project is located along Edinger Street and Heil Avenue within the City of Huntington Beach.

The Edinger Street portion of the project is approximately 1,200 feet in length and bounded by Hummingbird Lane on the east and Bolsa Chica Street on the west. Edinger Avenue is a four-lane roadway and traverses residential areas within the project limits. The roadway width appears to be sufficient to accommodate trench construction and traffic can be accommodated with localized lane closures.

The Heil Avenue portion of the project is bound by Clubhouse Lane on the east and Graham Street on the west. The Heil Avenue portion of the project is approximately 1,200 feet in length. Heil Avenue is a four-lane roadway within the project limits. The roadway width appears to be

sufficient to accommodate trench construction and traffic can be accommodated with localized lane closures.

Impacts to bus transit are not anticipated on these sections of roadway.

BAKER-MAIN TRUNK SEWER SYSTEM

Campus Drive Subtrunk Improvements

This project is located along approximately 2,000 feet of Campus Drive within the Cities of Irvine and Newport Beach. Campus Drive is a four to six-lane roadway within the project limits. The project is bounded by Von Karmen Avenue on the east and MacArthur Boulevard to the west. The roadway traverses a commercial area. The roadway width appears to be sufficient to accommodate trench construction and traffic can be accommodated with localized lane closures. If construction includes areas under the Campus Drive/MacArthur Boulevard intersection, jack-and-construction methods should be considered.

This project could impact OCTA Bus Route 461.

Fairview Relief Sewer

This project is located along approximately 8,000 feet of Fairview Street within the City of Costa Mesa. The project limits are Village Way to the north and Wilson Street to the south. Fairview Street is a six to eight-lane roadway within the project limits and traverses a variety of land uses. The roadway width appears to be sufficient to accommodate trench construction and traffic can be accommodated with localized lane closures.

Construction along this roadway segment could impact OCTA Bus Routes 45, 45 A, 56 and 56A.

GISLER-REDHILL TRUNK SEWER SYSTEM

Gisler-Redhill/North Trunk Improvements

This project is located along three segments of roadway located in the Cities of Orange and Tustin. The Prospect Avenue portion of the project is approximately 17,000 feet in length and bounded by Chapman Avenue to the north and Main Street to the south. Prospect Avenue is a two-lane roadway within the project limits. Street closures may be required to accommodate construction on this roadway. Traffic detours can be developed using the adjacent local roadways. Local access should be maintained to minimize traffic impacts.

The Main Street portion of the project is approximately 300 feet in length and located between Prospect Avenue to the east and El Camino Real to the west. Main Street is a two-lane roadway within the project limits. Street closures may be required to accommodate construction on this roadway. Traffic detours can be developed using the adjacent local roadways. Local access should be maintained to minimize traffic impacts.

The El Camino Real portion of the project is approximately 1,500 feet in length and located between Main Street to the north and Newport Avenue to the south. Street closures may be required to accommodate construction on this roadway. Traffic detours can be developed using the adjacent local roadways. Local access should be maintained to minimize traffic impacts.

Impacts to bus transit are not anticipated on these sections of roadway.

Gisler-Redhill System Improvements – A

This project is located along Arroyo Way within the County of Orange and along Skyline Drive and Redhill Avenue within the City of Tustin. The Arroyo Avenue portion of the project is approximately 2,600 feet in length and bounded by La Loma Drive to the north and Skyline Drive to the south. Arroyo Avenue is a two-lane roadway within the project limits. The Skyline Drive portion of the project is approximately 1,200 feet in length and bound by Arroyo Way to the north and Redhill Avenue to the south. Skyline Drive is a two-lane roadway within the project limits. The Redhill Avenue portion of the project is approximately 6,500 feet in length and bounded by Irvine Boulevard to the north and Mitchell Avenue to the south. Redhill Avenue varies between a two-lane roadway and a six-lane roadway.

Arroyo Avenue and Skyline Drive are local roadways. Street closures may be required on these roadways to accommodate construction. Adjacent roadways are available for detours. Redhill Avenue should be of sufficient width to accommodate trench construction. A freeway detour or jack-and-bore construction may be considered at the Redhill Avenue interchange with the Santa Ana Freeway (I-5) to minimize traffic impacts.

Impacts to bus transit are not anticipated on these sections of roadway.

Gisler-Redhill System Improvements – B

This project is located along approximately 12,300 feet of Redhill Avenue within the Cities of Tustin, Santa Ana and Irvine. The project limits are Mitchell Avenue to the north and Deere Avenue to the south. Redhill Avenue is a six-lane roadway within the project limits and traverses primarily commercial areas. Larger intersections are controlled with traffic signals. The roadway width is sufficient to accommodate trench construction methods with traffic controlled by localized lane closures. Jack-and-bore construction may be utilized at the Redhill Avenue intersections with Edinger Avenue, Warner Avenue and Barranca Parkway to minimize traffic impacts.

Construction along this segment of roadway could impact OCTA Bus Routes 71 and 463.

Tustin Trunk Improvements

This project is located along Cowan Heights Drive and Newport Avenue within the County of Orange and Irvine Boulevard within the County of Orange and City of Tustin. The Cowan Heights Drive portion of the project is located between Shady Ridge Drive to the east and

Newport Boulevard to the west. Cowan Heights Drive is a two-lane local roadway within the project limits. It is likely that the roadway will require closure to accommodate pipeline construction. Closures should be planned to minimize impacts to local residents. Closures must be coordinated with local agencies. A detour plan should be developed utilizing local roadways to the south.

Impacts to bus transit are not anticipated along this roadway segment.

The Newport Avenue portion of the project is approximately 12,200 feet in length and bounded by Crawford Canyon Road to the north and Irvine Boulevard to the south. Newport Avenue varies between two and four lanes within the project limits. The adjacent land uses are primarily residential to the north and mixed to the south. The two-lane segment of Newport Avenue may not easily accommodate trench construction due to the roadway width. While roadway closure may be necessary, it should be avoided if possible since available detour routes are circuitous. The four-lane segment of Newport Avenue should be able to accommodate trench construction with localized lane closures used to handle traffic.

Construction along this segment of roadway may impact OCTA Bus Route 67.

The Irvine Boulevard portion of the project is approximately 2,900 feet in length and bounded by Redhill Avenue to the east and Newport Avenue to the west. Irvine Boulevard is an 8-lane roadway within the project limits. The roadway width appears to be sufficient to accommodate trench construction and traffic can be accommodated with localized lane closures.

Construction at the Newport Avenue/Irvine Boulevard intersection may impact OCTA Bus Route 67.

Orange Trunk Improvements

This project is located along Hewes Street, Vanderlip Avenue and Holt Avenue within the County of Orange. The Hewes Street portion of the project is approximately 3,400 feet in length and bound by Fairhaven Avenue to the north and Vanderlip Avenue to the south. Hewes Street is a four-lane roadway within the project limits. The roadway traverses a residential neighborhood. The roadway width appears to be sufficient to accommodate trench construction and traffic can be accommodated with localized lane closures.

The Vanderlip Avenue portion of the project is approximately 2,400 feet in length and bound by Hewes Street to the east and Holt Avenue to the west. Vanderlip Avenue is a two-lane roadway within the project limits and may require street closure to accommodate pipeline construction. Should road closures be required, local access should be maintained with traffic detoured to adjacent roadways.

The Holt Avenue portion of the project is approximately 2,900 feet in length and bounded by Warren Avenue to the north and Newport Boulevard to the south. Holt Avenue is a four-lane

roadway within the project limits. The roadway width appears to be sufficient to accommodate trench construction and traffic can be accommodated with localized lane closures.

Impacts to bus transit are not anticipated on these sections of roadway.

Orange Park Acres Trunk Replacement

This project is located along approximately 2,900 feet of Santiago Canyon Road within the City of Orange. The project limits are Randall Street to the east and Jamestown Way to the west. Santiago Canyon Road is a four-lane roadway traversing a residential area within the project limits. The roadway width appears to be sufficient to accommodate trench construction and traffic can be accommodated with localized lane closures.

Impacts to bus transit are not anticipated on this section of roadway.

West Trunk Improvements

This project is located east of Prentica Park in the City of Santa Ana. Impacts to area roadways are not anticipated.

Armstrong Subtrunk

This project is located along Armstrong Avenue between Barranca Avenue to the north and Gillette Avenue to the south and along Gillette Avenue between Armstrong Avenue to the northwest and Main Street to the southeast. The Armstrong Avenue segment of the project is approximately 6,500 feet in length. Armstrong Avenue is a four-lane roadway within the project limits. The Gillette Avenue portion of the project is approximately 2,600 feet in length. The roadway width appears to be sufficient to accommodate trench construction and traffic can be accommodated with localized lane closures.

Gillette Avenue is a two-lane roadway within the project limits. The entire project is located within the City of Irvine. Closure of Gillette Avenue may be required to accommodate pipeline construction. Traffic can be detoured to adjacent roadways to accommodate construction.

Impacts to bus transit are not anticipated on these sections of roadway.

INTERPLANT

Bushard Trunk Improvement

This project is located along Bushard Street between Ellis Avenue to the north and Garfield Avenue to the south. The project is located within the Cities of Fountain Valley and Huntington Beach and is approximately 20,000 feet in length. Bushard Street is a four-lane roadway within the project limits and traverses residential neighborhoods. Larger intersections are controlled with traffic signals. The roadway width appears sufficient to accommodate trench construction

while allowing local residential access. Since the sewer line is at a shallow depth, jacking and boring will not be possible. Phased construction will be employed to minimize impacts to local residences and cross traffic.

Impacts to bus transit are not anticipated on this section of roadway.

Interplant Connector Pipeline

The interplant connector pipeline will involve inserting a liner into an existing 60-inch diameter pipeline. The pipeline runs underground along the Santa Ana River northern bank. Construction will involve excavation at regular intervals to access the pipeline along the SAR corridor since no manholes currently exist. The existing bikeway will be temporarily closed during construction.

PUMPING STATION AND MANHOLE REHABILITATION PROJECTS

Pump station improvement projects occur within pump buildings or vaults. This construction activity involves the delivery and replacement of large-volume pumping equipment. This type of construction does not require any lane closures.

Manhole foundation and cover rehabilitation typically requires work areas approximately 15 feet wide and 30 feet long accommodating two utility trucks. Generally, traffic will be detoured around the construction area. On narrower residential streets, parking restrictions may be required.

District-Proposed Mitigation

Mitigation 7.2-1a: Traffic control plans will be prepared by a qualified professional engineer, prior to the construction phase of each sewer line project as implementation proceeds.

Mitigation 7.2-1b: Traffic control plans will consider the ability of alternative routes to carry additional traffic and identify the least disruptive hours of construction site truck access routes, and the type and location of warning signs, lights and other traffic control devices. Consideration will be given to maintaining access to commercial parking lots, private driveways and sidewalks, bikeways and equestrian trails, to the greatest extent feasible.

Mitigation 7.2-1c: Encroachment permits for all work within public rights-of-way will be obtained from each involved agency prior to commencement of any construction. Agencies involved include Caltrans, the Orange County Public Facilities and Resources Department (Planning and Development Services Section) and the various cities where work will occur. The District will comply with traffic control requirements, as identified by Caltrans and the affected local jurisdictions.

Mitigation 7.2-1d: Traffic control plans will comply with the Work Area Traffic Control Handbook and/or the Manual of Traffic Controls as determined by each affected local agency, to minimize any traffic and pedestrian hazards that exist during project construction.

Mitigation 7.2-1e: The construction technique for the implementation of the proposed sewer lines, such as tunneling, cut and cover with partial street closure, or cut and cover with full street closure, should include consideration of the ability of the roadway system, both the street in question and alternate routes, to carry existing traffic volumes during project construction. If necessary, adjacent parallel streets will be selected as alternate alignments for the proposed sewer improvements. As required by local jurisdictions, trunk sewers will be jacked under select major intersections, to avoid traffic disruption and congestion.

Mitigation 7.2-1f: Public streets will generally be kept operational during construction, particularly in the morning and evening park hours of traffic. Lane closures will be minimized during peak traffic hours.

Mitigation 7.2-1g: Public roadways will be restored to their existing condition after project construction is completed.

Mitigation 7.2-1h: The Districts will attempt to schedule construction of relief facilities to occur jointly with other public works projects already planned in the affected locations, through careful coordination with all local agencies involved.

Mitigation 7.2-1i: Emergency service purveyors will be contacted and consulted to preclude the creation of unnecessary traffic bottlenecks that will seriously impede response times. Additionally, measures to provide an adequate level of access to private properties shall be maintained to allow delivery of emergency services.

Mitigation 7.2-1j: OCTA will be contacted when construction affects roadways that are part of the OCTA bus network.

Significance after Mitigation: Less than Significant.

Impact 7.2-2: Construction activities during manhole rehabilitation projects will impact circulation. Less than Significant.

During sewer and manhole rehabilitation projects, limited lane closures are anticipated. Construction equipment will consist of one or two trucks parked over the manhole in the street. No road closures are anticipated for rehabilitation projects. The nature of the construction work is short-term, occurring over a period of a few days. Construction activities would follow standard operating procedures and District construction specifications. Short-term lane closures do not constitute a significant impact. This impact is less than significant.

MITIGATION MEASURES

No mitigation measures are necessary.

REFERENCES – TRAFFIC

Katz, Okitsu & Associates, 1999.

7.3 BIOLOGICAL RESOURCES

7.3.1 SETTING

As mentioned in the Regional Setting discussion for Biological Resources, Section 4.5, the OCSD serves the urbanized northwestern section of Orange County. Before this area became intensely developed it consisted of coastal wetlands and flatlands. Today, few native plants or wildlife remain in the area. While almost 50 percent of the county is covered with natural vegetation, the OCSD service area contains only a few of the remaining representative plant communities. These are found along the upper Santa Ana River, Santiago Creek, and the foothill areas in and around Chino Hills State Park.

The most ecologically important communities within the project area are the coastal salt marshes of Sunset, Bolsa Chica, and Newport Bays (See **Figure 4-1**). The Bolsa Chica Ecological Reserve is of particular sensitivity, representing the largest relatively undisturbed coastal wetland remaining along the Orange County coastline. The U.S. Fish and Wildlife Service has identified a small portion of Huntington Beach just west of the Pacific Coast Highway near the mouth of the Santa Ana River to be a nesting area for the Federally and State listed endangered species, California Least Tern.

Additional sensitive habitats include the upstream areas of the Santa Ana River, Santiago Creek, and the open space areas of Orange County north of Yorba Linda. These areas remain in a relatively natural state and provide important habitat for a variety of plants and animals. Local, Regional and State Parks also exist within the Service Area including the Chino Hills State Park, Santiago Oaks Regional Park, Yorba Regional Park, Anaheim Wetlands, and the Talbert Nature Preserve. Wetland restoration projects are currently underway west and south of Treatment Plant No. 2 including the Talbert Marsh and portions of the former oil fields across the Santa Ana River. Other parklands include local nature preserves, city parks, and golf courses located throughout the Service Area.

7.3.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE THRESHOLDS

Impacts of the proposed project under any of the scenarios considered related to biological resources are considered to be significant if they result in:

- Substantial effects to rare or endangered species of animal or plant, or to the habitat of the species;
- Substantial interference with the movement of any resident or migratory fish or wildlife species;
- Substantial diminished habitat for fish, wildlife or plant; or

- Use, production or disposal of materials which pose a hazard to animal or plant population in the affected area.

CONSTRUCTION AND OPERATION

Impact 7.3-1: Based on conceptual alignment information for OCSD's proposed collection system projects, construction of the collection pipeline system improvements would occur in previously disturbed, developed areas, primarily public streets. No impact to biological resources would occur if projects occur within paved areas. However, if final project alignments are revised to include an undeveloped area or open space, potential impacts to biological resource could occur; in these cases OCSD would conduct additional CEQA as needed to clarify and address impacts to biological resources.

Most of the collection pipeline system is located within developed city streets which are graded and paved. The proposed sewer improvements involve replacing and upsizing existing sewer lines. Based on the conceptual alignments for the collection system projects, none of the projects, including the interplant connector, would disturb undeveloped soil or land. With this in mind, and considering that the Service Area is predominantly urbanized, no impacts to sensitive habitats are anticipated. Short-term noise generation and construction activity will not significantly alter the existing conditions within the urban city streets where existing wildlife has adapted to an elevated level of commotion.

Maps A1 through A12 in **Map Appendix A** show the proposed pipeline routes and project area for the collection system projects. Some of the pipeline projects extend within streets past parks, golf courses and other urban open space areas with vegetation but, as currently planned would not directly disrupt these area. If the District modifies a project alignment such that unpaved, vegetated area would be disturbed, the District would conduct additional CEQA review as appropriate to address potential impacts to biological resources.

The Interplant Connector and a portion of the Lower SARI Interceptor Improvement would be located along the Santa Ana River. Proposed improvements along these sections would occur in the berms along the river. The concrete lined section of the river has no habitat value for native species. The berms and associated maintenance roads and bike trails are regularly maintained and do not contain substantive biotic resources. Please see the Regional Setting, Section 4.5 Biological Resources discussion.

District-Proposed Mitigation

No mitigation required for collections system projects within paved areas.

> **Mitigation 7.3-1:** If in the future, as OCSD develops the design of each specific collection system project for implementation, a project alignment includes unpaved, undeveloped park or open space area, OCSD will conduct additional CEQA review as needed to clarify and address potential impacts to biological resources.

REFERENCES – BIOLOGICAL RESOURCES

County Sanitation District of Orange County, *1989 Master Plan EIR.*

California Department of Fish and Game, *California Natural Diversity Database* – record search, February 1999.

7.4 NOISE

7.4.1 SETTING

Section 4.6, in Chapter 4.0, Regional Setting, provides a discussion of noise descriptors and examples of some representative noise sources. A discussion of the local noise environment and the existing sewer collection system is provided below.

As described in the Project Description, the Orange County Sanitation District (OCSD) operates trunk sewer systems that cross through 23 municipalities. These trunk sewer systems connect to OCSD's Reclamation Plant No. 1 in Fountain Valley and Treatment Plant No. 2 in Huntington Beach (see **Figure 3-13**). Nine of the District's trunk systems have insufficient pipeline capacities and/or strength/durability deficiencies in one or more places that must be reconciled to meet future storage and flow requirements. Since the deficiencies are based on flow projections, they are equally applicable to each of the treatment scenarios evaluated in this EIR.

In order to rectify its collection system deficiencies, OCSD proposes to complete 33 pipeline replacement projects and 13 manhole and pipeline rehabilitation projects. In addition, four of OCSD's 26 pumping stations are proposed for equipment/pump upgrades.

SENSITIVE RECEPTORS AND EXISTING NOISE ENVIRONMENT

Some land uses are considered more sensitive to noise levels than others, due to the amount of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities typically involved. Residential areas, schools, and hospitals generally are more sensitive to noise than are commercial and industrial land uses. Land uses along the seven sewer trunk system lines and in the vicinity of the proposed manhole and pipeline rehabilitation projects vary from industrial and commercial to residential.

The majority of the required collection system construction would occur in urbanized areas of Orange County, where the primary noise source is vehicle traffic. Noise levels in a typical urban residential environment range from between 45 and 68 dBA, Ldn. In such an environment, noise levels are between 48 and 58 Leq, roughly 80 percent of the time (Cunniff,1977).

A brief discussion of sensitive receptors along each of the seven sewer trunk system proposed for replacement projects is provided below.

SANTA ANA RIVER TRUNK SEWER SYSTEM

Santa Ana River Interceptor Relief – A (Project No. 20)

The Santa Ana River Interceptor Relief – A Project would occur under La Palma Avenue and Grove Street in the City of Anaheim. Surrounding land uses include primarily of commercial and light industrial uses. The Santa Ana River and the Santa Ana River Lakes are located south of La

Palma Avenue. A metro link station is located west of Jefferson Street. The Riverside Freeway (91) is located east of the Santa Ana River.

Santa Ana River Interceptor Relief – B (Project No. 25)

The Santa Ana River Interceptor Relief – B Project would occur within Ranch Parkway and Wier Canyon in the City of Yorba Linda and within La Palma Avenue in the City of Anaheim. Surrounding land uses include residential, commercial, and light industrial uses. Other uses include office and auto dealership uses. Sensitive receptors in the area include single- and multi-family residences, a church, Yorba Regional Park and the Anaheim Wetlands Park.

Taft Branch Improvements (Project No. 2)

The Taft Branch Improvements Project would occur within Meats Avenue, Tustin Avenue, and Taft/Candelwood Avenue in the City of Orange. Surrounding land uses include primarily residential and institutional uses. Sensitive receptors include a pre-school, three churches, a mobile home park, and single- and multi-family residences.

Carbon Canyon Dam Trunk Improvement (Project No. 4)

The Carbon Canyon Dam Trunk Improvements Project would occur within Rose Drive in the Cities of Placentia and Yorba Linda. Surrounding land uses include commercial and residential uses. Agricultural uses (strawberry fields) are also located in the immediate vicinity. A California State Department of Motor Vehicles office is located at the northern end of the project site. Nearby sensitive receptors include two churches, two schools, and single-family residences.

Atwood Subtrunk Improvements (Project Nos. 8 and 21)

The Atwood Subtrunk Improvements Project would occur within Orangethorpe Avenue in the Cities of Anaheim and Placentia. Surrounding land uses commercial, light industrial and residential uses. Sensitive receptors include single-family and multi-family residences.

Lower Santa Ana River Interceptor (SARI) Improvements (Project No. 27)

The Lower SARI Interceptor Improvements Project would occur along the Santa Ana River in the Cities of Anaheim and Orange. The Santa Ana River runs along the northern edge of the project area for approximately three miles. Sensitive receptors along this segment include single-family residential uses.

EUCLID TRUNK SEWER SYSTEM

Fullerton Purchase Improvements (Project No. 10)

The portions of the sewer line that require replacement or rehabilitation are located within Bastanchury Road in the City of Fullerton. Land uses in this area include residential and open space. Sensitive receptors along Bastanchury Road include single-family residences.

Euclid Relief Improvements – A (Project No. 14)

The portions of the sewer line that require replacement or rehabilitation are located within Euclid Street in the City of Fountain Valley. Land uses along this segment of pipeline include recreational, commercial and residential uses. Miles Square Park is located west of Euclid Street. Sensitive receptors include single-family residences and Fountain Valley Regional Hospital.

Euclid Relief Improvements – B (Project No. 29)

The portions of the sewer line that require replacement are located within Euclid Street in the City of Fountain Valley. Residential and light industrial land uses surround this segment of pipeline. Sensitive receptors adjacent to this segment of Euclid Street include a church and single-family residences.

NEWHOPE-PLACENTIA TRUNK REPLACEMENT

Newhope-Placentia Trunk Replacement (Project No. 18-A)

The Newhope-Placentia Trunk Replacement Project would occur within State College Boulevard in the Cities of Orange and Anaheim. Surrounding land uses include light industrial and commercial uses. Anaheim Stadium is located east of State College Boulevard. Sensitive receptors in the area include single- and multi-family residences, a school, two parks, three churches, and a veterinarian hospital.

Cypress Avenue Trunk Replacement (Project No. 18-B)

The Cypress Avenue Trunk Replacement Project would occur within Yorba Linda Road and State College Boulevard in the City of Fullerton. Surrounding land uses include institutional, commercial and light industrial uses. California State University at Fullerton is located nearby. Sensitive receptors include a mobile home park, La Vista High School, two churches and nearby single-and multi-family residences.

KNOTT TRUNK SEWER SYSTEM

Hoover Feeder Improvements (Project No. 16)

The portions of the sewer line that require replacement or rehabilitation are located within Trask Avenue in the City of Westminster. Land uses in the area include residential uses intermixed with scattered commercial/retail uses. Sensitive receptors include single- and multi-family residences.

West Side Relief Improvements (Project No. 23)

The West Side Relief Interceptor Improvements Project would occur under Seal Beach Boulevard in the Cities of Seal Beach and Los Alamitos. Surrounding land uses include commercial and residential areas. An office and a golf course are also located nearby. The Armed Forces

Reserve Center is located east of this project area. Sensitive receptors in the area include single- and multi-family residences, two churches and a nursing home.

Warner Avenue Relief Sewer (Project Nos. 17 and 28)

The Warner Avenue Relief Sewer Project would occur within Los Patos Avenue and Warner Avenue in the City of Huntington Beach. Surrounding land uses include the Bolsa Chica Ecological Reserve and residential uses. The Meadowlark Golf Course is located north of Warner Avenue. Sensitive receptors include the singe-family residences located north of Los Patos Avenue.

Edinger/Bolsa Chica Trunk Improvements (Project No. 30)

The portions of the sewer line that require replacement or rehabilitation are located within Edinger Street in the City of Huntington Beach. Surrounding land uses include primarily residential and light industrial uses. The U.S. Naval Weapons Station is located in the immediate area. Sensitive land uses include Marina Community Park, Marina High School and single-family residences.

BAKER-MAIN TRUNK SEWER SYSTEM

Campus Drive Subtrunk Improvements (Project Nos. 24 and 31)

The portions of the sewer line that require replacement or rehabilitation are located within Campus Drive in the Cities of Irvine and Newport Beach. Land uses along this segment of pipeline include primarily office and commercial uses. Air traffic from John Wayne Airport is the primary source of noise in this area.

Fairview Relief Sewer (Project No. 3)

The portions of the sewer line that require replacement or rehabilitation are located within Fairview Road in the City of Costa Mesa. Land uses in this area include commercial, residential and institutional uses, including Orange Coast College, Costa Mesa High School, and Southern California College. Sensitive receptors located adjacent to this segment of pipeline include single- and multi-family residential uses.

GISLER-REDHILL TRUNK SEWER SYSTEM

Gisler-Redhill/North (Project No. 6)

The Gisler-Rehill/North Trunk Improvements would occur within Prospect Avenue, Main Street and El Camino Real in the City of Tustin. Surrounding land uses consist of residential and commercial/office uses. Sensitive receptors in the area include single-family residences, three churches, a pre-school and a junior high school.

Gisler-Redhill System Improvements – A (Project No. 9)

The portions of the sewer line that require replacement or rehabilitation are located within Arroyo Avenue, Skyline Boulevard and Redhill Avenue in the City of Tustin and in unincorporated areas of Orange County. Surrounding land uses include primarily residential and commercial uses. Sensitive receptors in the area include single- and multi- family residences, Pine Tree Park, churches and Tustin High School.

Gisler-Redhill System Improvements – B (Project Nos. 22, 13 and 32)

The portions of the sewer line that require replacement are located under Redhill Avenue in the Cities of Tustin and Santa Ana. Surrounding land uses include mostly residential and commercial uses. The closed U.S. Marine Corps Air Station is located east of Redhill Avenue. Nearby sensitive receptors include single- and multi-family residences, A.G. Curry Middle School, and Navy housing.

Tustin Trunk Improvements (Project Nos. 12, and 19, 11)

The Tustin Trunk Improvements Project would occur under Cowan Heights Drive, Newport Avenue, and Irvine Boulevard in the City of Tustin and unincorporated areas of Orange County. Surrounding land uses include primarily residential and commercial uses. Nearby sensitive receptors include single- and multi-family residences, churches, and schools, including Foothill High School.

Orange Trunk Improvements (Project No. 5)

The portions of the sewer line that require replacement are located within Hewes Avenue, Vanderlip Avenue and Holt Avenue in unincorporated Orange County. Surrounding land uses include primarily residences. Nearby sensitive receptors include single- and multi-family residences and Hewes Middle School.

Orange Park Acres Trunk Improvements (Project No. 7)

The Orange Park Acres Trunk Replacement Project would occur within Santiago Canyon Road in the City of Orange. Land uses in the area include primarily residential and recreational uses. Nearby sensitive receptors include single-family residences, a school and a church.

West Trunk Improvements (Project No. 26)

The portions of the sewer line that require replacement or rehabilitation would occur east of Prentica Park between 1st Street and West Main Street in the City of Santa Ana. Surrounding land uses include primarily commercial/office uses. A daycare/elementary school is located in the immediate vicinity of the proposed pipeline improvements.

Armstrong Subtrunk Improvements (Project No. 7-27)

The Armstrong Subtrunk Improvement Project would occur within Armstrong and Gillete in the City of Irvine. Land uses in the area include primarily light industrial uses. John Wayne Airport and an industrial park are also located in the vicinity of this pipeline segment.

INTERPLANT/JOINT WORKS

Bushard Trunk Improvements (Project No. 1)

The portions of the sewer line that require replacement or rehabilitation are located within Bushard Street in the Cities of Fountain Valley and Huntington Beach. Land uses along this segment of pipeline include primarily residential uses intermixed with scattered commercial/retail uses. Single- and multi-family residences and a nursing home are located adjacent to Bushard Street. A portion of the sewer just west of the terminus at Treatment Plant No.2 underlies residential properties.

REGULATORY ENVIRONMENT

Federal, state, and local agencies regulate different aspects of environmental noise. Federal and state agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources is left to local agencies. Local regulation of noise involves implementation of General Plan policies and Noise Ordinance standards. Local General Plans identify general principles intended to guide and influence development plans, and Noise Ordinances set for the specific standards and procedures for addressing particular noise sources and activities.

General Plans recognize that different types of land uses have different sensitivities toward their noise environment; residential areas are generally considered to be the most sensitive type of land use to noise and industrial/commercial areas are generally considered to be the least sensitive. Local noise ordinances typically set forth standards related to construction activities, nuisance-type noise sources, and industrial property-line noise levels. Noise ordinances were reviewed for those cities that would be affected by the above-described collection system improvements. For the most part, each of the cities has established limitations on construction noise by limiting the hours that construction activities may occur. The most stringent noise ordinances limited construction activities to between the hours of 7:00 a.m. and 6:00 p.m. on weekdays, and 9:00 a.m. and 5:00 p.m. on Sundays. In many of the affected cities, construction is not permitted on Sundays or holidays.

7.4.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

Appendix G of the revised *CEQA Guidelines* (Governor's Office of Planning and Research, 1998) indicates that a project could be significant if it would:

- expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- expose persons to or generate excessive groundborne vibration or groundborne noise levels;
- result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;

A change in noise levels of less than three dBA is not discernible to the general population; an increase in average noise levels of three to five dBA is clearly discernible to most people (California Department of Transportation, 1991). An increase in the noise environment of five dBA or greater is considered to be the minimum required increase for a change in community reaction (U.S. Department of Transportation, 1990) and, for the purposes of this analysis, constitutes a significant noise impact. With temporary construction noise impacts, identification of "substantial increases" depends upon the duration of the impact, the temporal daily nature of the impact, as well as the absolute change in dBA levels.

For operational impacts, operational noise that would exceed the "normally acceptable" land use compatibility noise range of the general plan in the jurisdiction where a project element is proposed would be considered a significant noise impact. If a land use already exists in a "conditionally acceptable" or "normally unacceptable" noise compatibility environment, as designated in the General Plan, then an increase in operational noise that would result in a change of land use compatibility category would be considered a significant noise impact. For land uses designated as within a "clearly unacceptable" noise compatibility environment, operational noise that would result in a three dBA or greater increase to the existing noise environment would be considered significant, if sensitive receptors that would be affected are present. If sensitive receptors would not be present but the land use is considered sensitive to noise, then a five dBA increase would be considered significant. Otherwise, an increase would only be considered significant if it violated a local noise ordinance or substantially contributed to an existing violation of a noise ordinance.

CONSTRUCTION

Impact 7.4-1: Construction activities related to the proposed collection system improvements would intermittently and temporarily generate noise levels above existing ambient levels in the project vicinity. Less than Significant with Mitigation Measures.

Construction-related noise levels along the sewer trunk systems and manhole and pipeline rehabilitation project sites would fluctuate depending on the particular type, number, and duration of use of various pieces of construction equipment. The proposed pump station equipment upgrades would occur entirely within existing enclosed buildings or vaults and would therefore not affect the noise environment of any nearby sensitive receptors during installation. The effect of construction noise would depend upon how much noise would be generated by the equipment,

the distance between construction activities and the nearest noise-sensitive uses, and the existing noise levels at those sensitive uses.

In general, proposed pipeline improvements would involve the replacement of underground sewer lines with larger pipes. Nearly 47 miles of pipeline replacements are proposed almost exclusively within developed city streets (see **Table 3-19** in Chapter 3.0, Project Description, for a list of the pipeline replacement projects and the impacted streets). The pipeline replacements would involve two types of construction: (1) the open trench method, which involves the removal of pavement and excavation of soil and pipes; and (2) the jack-and-bore method, which involves the use of a horizontal boring machine or auger to drill a hole and a hydraulic jack to push a casing through the hole; the pipeline is then installed in the casing. Jack-and-bore methods are used for sensitive crossings (e.g., busy intersections or flood control channels).

Table 7.4-1 shows typical noise levels generated by different types of construction equipment. The types of construction equipment that would be used for the proposed pipeline replacements include:

- Pavement saws
- Jack hammers
- Back hoes
- Front-end loaders
- 10-wheel dump trucks
- Flat-back delivery trucks
- Cranes
- Compactors
- Water trucks
- Trench shields
- Air compressors
- Concrete trucks
- Concrete pumper trucks
- Sweepers
- Welding trucks
- Road grader (for widening at detours along shoulders
- Side boom pipe handler tractors
- Paving equipment: back hoe, asphalt hauling trucks, compactors, paving machine, rollers

Non-impact equipment would be used to complete all open trench construction including the Interplant Connector. As shown in **Table 7.4-1**, the noisiest non-impact construction equipment would generate noise at a level of approximately 68 to 96 L_{eq} at 50 feet, assuming no noise mitigation features. Sensitive receptors are located as close as 10 feet from the pipeline replacement activities. More typically, receptors are set back some 50 to 100 feet from the proposed construction areas. At a distance of 50 feet, noise levels would be between 68 to 96 L_{eq}. Noise levels would be correspondingly higher at receptor sites located closer to construction activities, and lower at distances further from such activities. Noise levels in this range would be substantially higher than the ambient noise levels experienced by sensitive receptors in a typical urban residential environment. In many areas along the sewer trunk systems, intervening structures/sound walls, trees and berms (between the proposed construction area and residences) may provide some noise attenuation.

Jack-and-bore locations may require installation of sheetpiles to shore jack-pit excavations. As shown in **Table 7.4-1**, pile drivers generate noise levels in the range of 95 to 101 L_{eq} at 50 feet. Residences at 50 feet from pile driving activities would be exposed to these noise levels. Intermittent noises such as pile driving are more disturbing to many people than typical construction noise. At noise levels of 85 dBA, normal conversation is extremely difficult, and

sleep is impossible for most people. The extent of impact would also depend on the proximity of pile driving activities to existing receptors.

The proposed construction schedule shows that the majority of the pipeline replacements would occur by 2005, but that some intermittent construction would continue through 2020. Pipeline replacements would be installed at a rate of approximately 100 feet per day per crew for pipeline replacements with diameters of 12 to 48 inches and 50 feet per day for those greater than

TABLE 7.4-1
TYPICAL CONSTRUCTION EQUIPMENT NOISE LEVELS

Equipment	Noise Level at 50 feet (L_{eq})
Backhoes [a]	71-95
Dozers	74-93
Trucks	70-96
Pumps	69-80
Generators	69-82
Compressors	68-95
Pile Drivers	95-101

[a] Backhoes are a common type of excavator.

SOURCE: *Handbook of Noise Control*, Cyril M. Harns, 1979; *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances*, Bolt, Baranek, and Newman, 1971.

48 inches. The length of time that active construction work is immediately in front of a property would likely be between three and five days. Construction activities would occur within one block of a given property for roughly three to four weeks on average. The duration of impact would depend on the length of the sewer being replaced or rehabilitated, the sewer size, and existing depth of the pipe. All construction activities within residential districts would be limited to weekdays during daylight hours, or as specified in encroachment permits with the County, cities and other responsible agencies.

No trenching would be required for the proposed manhole rehabilitation projects. The construction area extending over the manhole would be approximately 15 feet wide and 30 feet long (enough to accommodate two utility trucks). Manhole rehabilitation would be conducted from within the manhole construction area and would involve internal pipeline re-lining and maintenance. Noise levels associated with the manhole rehabilitation projects would be expected to be similar to those for the pipeline replacement projects, if not lower.

Because of the proximity of sensitive receptors to proposed construction areas and the anticipated existing daytime noise levels, daytime construction work would significantly affect the noise environment of residences and other sensitive land uses adjacent to construction. While the

majority of the proposed construction period would occur when a majority of people are at work, retired persons, people who work at home, and people caring for children in their homes could be significantly affected by noise when construction activities occurred in their immediate vicinity. The duration of impact would likely be three to five days, as construction approached, reached, and departed the area of each sensitive receptor. Because construction noise impacts would have such a short duration they are considered less than significant.

EIR-Identified Mitigation

Measure 7.4-1a: Construction activities should be limited to between the hours of 7:30 a.m. and 5:30 p.m. and as necessary to comply with local ordinances. Any nighttime or weekend construction activities would be subject to local permitting.

Measure 7.4-1b: All equipment used during construction should be muffled and maintained in good operating condition. All internal combustion engine driven equipment should be fitted with intake and exhaust mufflers that are in good condition.

Measure 7.4-1c: Contractors should use vibratory pile drivers instead of conventional pile drivers where feasible and effective in reducing impact noise from shoring of jack-pit locations in close proximity to residential areas, where applicable.

Measure 7.4-1d: Sensitive receptors affected by pipeline replacement projects, and manhole rehabilitation activities should be notified concerning the project timing and construction schedule, and should be provided with a phone number to call with questions or complaints.

Significance After Mitigation: While these mitigation measures alone would not reduce noise levels, they would make high construction-noise levels predictable and easier for residents and other sensitive receptors to avoid.

With mitigation, construction activities would still increase ambient noise levels along portions of OCSD's sewer trunk system lines. However, mitigation would reduce the increase in noise due to construction and would reduce the chance of exposing people to substantial noise levels. Because of the limited duration of the impact to any one sensitive receptor, the residual impact would be less than significant.

Impact 7.4-2: Construction truck traffic would generate noise levels above existing ambient levels along haul routes used to transport materials to and from the project sites. Less than Significant.

Sensitive receptors located adjacent to project construction areas and along haul routes would be subject to truck noise during project construction. Truck volumes would vary with each project component and with each phase of development, although the highest levels of truck traffic on local roadways would occur during the excavation and concrete placement phases of project

construction. During other phases of construction, project-related truck traffic would be associated with equipment and supply deliveries, which would require fewer truck trips.

Based on similar pipeline projects, construction related to the proposed pipeline replacements would be expected to result in a peak of 100 one-way truck trips per day. When averaged over eight hours, construction would generate an average truck volume of 13 one-way truck trips per hour, or one truck every four or five minutes. Construction work for each of the proposed pipeline replacement projects could occur simultaneously at multiple locations. It is expected that concurrent construction locations would be spaced apart, and truck traffic noise impacts would be divided between locations. Truck noise would be more noticeable along residential streets, which currently see little truck traffic, than along major arterials. The proposed limiting of construction activities to daytime hours of least noise sensitivity would help reduce potential noise impacts on residents living along the haul route to a less-than-significant level. In many areas along the sewer trunk systems, intervening structures/sound walls, trees and berms (between the proposed construction area and residences) would effectively shield adjacent land uses from truck noise along that section of the proposed improvements.

The proposed manhole rehabilitation projects and pump station upgrades, which would involve delivery and replacement of large-volume pumping equipment would also generate truck traffic, but would not be expected to significantly affect ambient noise levels at nearby sensitive receptor locations.

Mitigation Measure

No mitigation measures are required.

OPERATION

Impact 7.4-3: Operation of the upgraded collection system would not generate noise levels above existing ambient levels in the project vicinity. Less than Significant.

The proposed pipeline replacements and manhole rehabilitation projects would be water conveyance facilities located underground. Because of the depth of burial, noise generated by flows would not be audible. Consequently, these project components would not affect ambient noise levels.

Each of the four pump station upgrades would occur within an enclosed building or underground vault, where pumps already exist. The enclosed buildings and underground vaults serve to substantially reduce noise from pump operations. Noise could escape buildings through ventilation systems. Historically, noise from the pump station operations has not affected the noise environment of nearby sensitive receptors. The replacement of older lowered power pumps with higher capacity pumps would not be expected to significantly affect noise released through existing ventilation systems. Therefore, this would be a less than significant impact.

Mitigation Measure

No mitigation measures are required.

REFERENCES - NOISE

Bolt, Baranek, and Newman, *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances*, 1971.

California Department of Transportation, *Noise, Technical Analysis Notes*, Second Draft, 1991.

Cunniff, Patrick, *Environmental Noise Pollution*, 1977.

Governor's Office of Planning and Research, *CEQA Guidelines Revisions,* October 26, 1998.

Harns, Cyril M., *Handbook of Noise Control*, 1979.

U.S. Department of Transportation, Urban Mass Transportation Administration, *Guidance Manual for Transportation, Noise and Vibration Impact Assessment*, July 1990.

7.5 AIR QUALITY

7.5.1 SETTING

LOCAL CLIMATE AND EXISTING AIR QUALITY

The collection system maintained by OCSD is located in Orange County (see **Figure 3-13)** within the South Coast Air Basin. The climatological and meteorological conditions at these locations are the same as the regional setting presented in Section 4.7 of this document.

EXISTING AIR POLLUTION SOURCES

Existing air pollutant emissions associated with the collection systems are limited to the emissions of odorous gases, primarily hydrogen sulfide (H_2S) gas, and other compounds associated with wastewater. The following discussion summarizes OCSD's 1998 Annual Report and presents OCSD's odor management program for its collection system.

Currently, OCSD owns and operates 21 raw sewage pumping stations throughout its Service Area and one small privately-owned facility. Odor is present at a number of the sewage pump stations due to the release of hydrogen sulfide (H_2S) as flows enter the wet wells. The odors can be a nuisance to surrounding neighbors although current complaint levels are negligible. OCSD's H_2S Management Program for the collection system focuses on maintaining aqueous H_2S levels of 2 parts per million (ppm) or less throughout the trunk sewer system.

In August 1997, OCSD formed a team to address odor, sulfide, and corrosion issues within the wastewater collection systems, under the Odor and Corrosion Control for Collection system Program. OCSD studied various options for controlling potential odors generated at five pumping station locations – Bay Bridge, Main Street, Seal Beach, Slater Avenue, and Westside Pump Stations. These stations were selected because of their proximity to residential and/or commercial areas and the potential for odor complaints. Odor control practices at these locations vary from activated carbon to no control. Additionally, OCSD has included the College Pump Station as a potential location for on-site odor control measures. However, odor complaints associated with any of the above-mentioned stations are found to be negligible

SENSITIVE RECEPTORS

The sensitive receptors in the immediate vicinity of the collection systems are identified in **Maps A1** through **A12** in the Map Appendix and are briefly described below.

SANTA ANA RIVER TRUNK SEWER SYSTEM

Santa Ana River Interceptor Relief – A (Project No. 20)

The Santa Ana River Interceptor Relief – A Project would occur under La Palma Avenue and Grove Street in the City of Anaheim. Surrounding land uses include primarily of commercial and

light industrial uses. The Santa Ana River and the Santa Ana River Lakes are located south of La Palma Avenue. A metro link station is located west of Jefferson Street. The Riverside Freeway (91) is located east of the Santa Ana River.

Santa Ana River Interceptor Relief – B (Project No. 25)

The Santa Ana River Interceptor Relief – B Project would occur within Ranch Parkway and Wier Canyon in the City of Yorba Linda and within La Palma Avenue in the City of Anaheim. Surrounding land uses include residential, commercial, and light industrial uses. Other uses include office and auto dealership uses. Sensitive receptors in the area include single- and multi-family residences, a church, Yorba Regional Park and the Anaheim Wetlands Park.

Taft Branch Improvements (Project No. 2)

The Taft Branch Improvements Project would occur within Meats Avenue, Tustin Avenue, and Taft/Candelwood Avenue in the City of Orange. Surrounding land uses include primarily residential and institutional uses. Sensitive receptors include a pre-school, three churches, a mobile home park, and single- and multi-family residences.

Carbon Canyon Dam Trunk Improvement (Project No. 4)

The Carbon Canyon Dam Trunk Improvements Project would occur within Rose Drive in the Cities of Placentia and Yorba Linda. Surrounding land uses include commercial and residential uses. Agricultural uses (strawberry fields) are also located in the immediate vicinity. A California State Department of Motor Vehicles office is located at the northern end of the project site. Nearby sensitive receptors include two churches, two schools, and single-family residences.

Atwood Subtrunk Improvements (Project Nos. 8 and 21)

The Atwood Subtrunk Improvements Project would occur within Orangethorpe Avenue in the Cities of Anaheim and Placentia. Surrounding land uses commercial, light industrial and residential uses. Sensitive receptors include single-family and multi-family residences.

Lower Santa Ana River Interceptor (SARI) Improvements (Project No. 27)

The Lower SARI Interceptor Improvements Project would occur along the Santa Ana River in the Cities of Anaheim and Orange. The Santa Ana River runs along the northern edge of the project area for approximately three miles. Sensitive receptors along this segment include single-family residential uses.

EUCLID TRUNK SEWER SYSTEM

Fullerton Purchase Improvements (Project No. 10)

The portions of the sewer line that require replacement or rehabilitation are located within Bastanchury Road in the City of Fullerton. Land uses in this area include residential and open space. Sensitive receptors along Bastanchury Road include single-family residences.

Euclid Relief Improvements – A (Project No. 14)

The portions of the sewer line that require replacement or rehabilitation are located within Euclid Street in the City of Fountain Valley. Land uses along this segment of pipeline include recreational, commercial and residential uses. Miles Square Park is located west of Euclid Street. Sensitive receptors include single-family residences and Fountain Valley Regional Hospital.

Euclid Relief Improvements – B (Project No. 29)

The portions of the sewer line that require replacement are located within Euclid Street in the City of Fountain Valley. Residential and light industrial land uses surround this segment of pipeline. Sensitive receptors adjacent to this segment of Euclid Street include a church and single-family residences.

NEWHOPE-PLACENTIA TRUNK REPLACEMENT

Newhope-Placentia Trunk Replacement (Project No. 18-A)

The Newhope-Placentia Trunk Replacement Project would occur within State College Boulevard in the Cities of Orange and Anaheim. Surrounding land uses include light industrial and commercial uses. Anaheim Stadium is located east of State College Boulevard. Sensitive receptors in the area include single- and multi-family residences, a school, two parks, three churches, and a veterinarian hospital.

Cypress Avenue Trunk Replacement (Project No. 18-B)

The Cypress Avenue Trunk Replacement Project would occur within Yorba Linda Road and State College Boulevard in the City of Fullerton. Surrounding land uses include institutional, commercial and light industrial uses. California State University at Fullerton is located nearby. Sensitive receptors include a mobile home park, La Vista High School, two churches and nearby single-and multi-family residences.

KNOTT TRUNK SEWER SYSTEM

Hoover Feeder Improvements (Project No. 16)

The portions of the sewer line that require replacement or rehabilitation are located within Trask Avenue in the City of Westminster. Land uses in the area include residential uses intermixed

with scattered commercial/retail uses. Sensitive receptors include single- and multi-family residences.

West Side Relief Improvements (Project No. 23)

The West Side Relief Interceptor Improvements Project would occur under Seal Beach Boulevard in the Cities of Seal Beach and Los Alamitos. Surrounding land uses include commercial and residential areas. An office and a golf course are also located nearby. The Armed Forces Reserve Center is located east of this project area. Sensitive receptors in the area include single- and multi-family residences, two churches and a nursing home.

Warner Avenue Relief Sewer (Project Nos. 17 and 28)

The Warner Avenue Relief Sewer Project would occur within Los Patos Avenue and Warner Avenue in the City of Huntington Beach. Surrounding land uses include the Bolsa Chica Ecological Reserve and residential uses. The Meadowlark Golf Course is located north of Warner Avenue. Sensitive receptors include the singe-family residences located north of Los Patos Avenue.

Edinger/Bolsa Chica Trunk Improvements (Project No. 30)

The portions of the sewer line that require replacement or rehabilitation are located within Edinger Street in the City of Huntington Beach. Surrounding land uses include primarily residential and light industrial uses. The U.S. Naval Weapons Station is located in the immediate area. Sensitive land uses include Marina Community Park, Marina High School and single-family residences.

BAKER-MAIN TRUNK SEWER SYSTEM

Campus Drive Subtrunk Improvements (Project Nos. 24 and 31)

The portions of the sewer line that require replacement or rehabilitation are located within Campus Drive in the Cities of Irvine and Newport Beach. Land uses along this segment of pipeline include primarily office and commercial uses. Air traffic from John Wayne Airport is the primary source of noise in this area.

Fairview Relief Sewer (Project No. 3)

The portions of the sewer line that require replacement or rehabilitation are located within Fairview Road in the City of Costa Mesa. Land uses in this area include commercial, residential and institutional uses, including Orange Coast College, Costa Mesa High School, and Southern California College. Sensitive receptors located adjacent to this segment of pipeline include single- and multi-family residential uses.

GISLER-REDHILL TRUNK SEWER SYSTEM

Gisler-Redhill/North (Project No. 6)

The Gisler-Rehill/North Trunk Improvements would occur within Prospect Avenue, Main Street and El Camino Real in the City of Tustin. Surrounding land uses consist of residential and commercial/office uses. Sensitive receptors in the area include single-family residences, three churches, a pre-school and a junior high school.

Gisler-Redhill System Improvements – A (Project No. 9)

The portions of the sewer line that require replacement or rehabilitation are located within Arroyo Avenue, Skyline Boulevard and Redhill Avenue in the City of Tustin and in unincorporated areas of Orange County. Surrounding land uses include primarily residential and commercial uses. Sensitive receptors in the area include single- and multi- family residences, Pine Tree Park, churches and Tustin High School.

Gisler-Redhill System Improvements – B (Project Nos. 22, 13 and 32)

The portions of the sewer line that require replacement are located under Redhill Avenue in the Cities of Tustin and Santa Ana. Surrounding land uses include mostly residential and commercial uses. The closed U.S. Marine Corps Air Station is located east of Redhill Avenue. Nearby sensitive receptors include single- and multi-family residences, A.G. Curry Middle School, and Navy housing.

Tustin Trunk Improvements (Project Nos. 12, and 19, 11)

The Tustin Trunk Improvements Project would occur under Cowan Heights Drive, Newport Avenue, and Irvine Boulevard in the City of Tustin and unincorporated areas of Orange County. Surrounding land uses include primarily residential and commercial uses. Nearby sensitive receptors include single- and multi-family residences, churches, and schools, including Foothill High School.

Orange Trunk Improvements (Project No. 5)

The portions of the sewer line that require replacement are located within Hewes Avenue, Vanderlip Avenue and Holt Avenue in unincorporated Orange County. Surrounding land uses include primarily residences. Nearby sensitive receptors include single- and multi-family residences and Hewes Middle School.

Orange Park Acres Trunk Improvements (Project No. 7)

The Orange Park Acres Trunk Replacement Project would occur within Santiago Canyon Road in the City of Orange. Land uses in the area include primarily residential and recreational uses. Nearby sensitive receptors include single-family residences, a school and a church.

West Trunk Improvements (Project No. 26)

The portions of the sewer line that require replacement or rehabilitation would occur east of Prentica Park between 1st Street and West Main Street in the City of Santa Ana. Surrounding land uses include primarily commercial/office uses. A daycare/elementary school is located in the immediate vicinity of the proposed pipeline improvements.

Armstrong Subtrunk Improvements (Project No. 7-27)

The Armstrong Subtrunk Improvement Project would occur within Armstrong and Gillete in the City of Irvine. Land uses in the area include primarily light industrial uses. John Wayne Airport and an industrial park are also located in the vicinity of this pipeline segment.

INTERPLANT/JOINT WORKS

Bushard Trunk Improvements (Project No. 1)

The portions of the sewer line that require replacement or rehabilitation are located within Bushard Street in the Cities of Fountain Valley and Huntington Beach. Land uses along this segment of pipeline include primarily residential uses intermixed with scattered commercial/retail uses. Single- and multi-family residences and a nursing home are located adjacent to Bushard Street. A portion of the sewer just west of the terminus at Treatment Plant No.2 underlies residential properties.

7.5.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

The SCAQMD has established the following thresholds of significance for air quality for construction activities and project operation for non-permitted equipment:

	Project Construction	Project Operation
Carbon Monoxide (CO)	550 lbs. per day	550 lbs. per day
Reactive Organic Compounds (ROC)	100 lbs. per day	55 lbs. per day
Nitrogen Oxides (NO_x)	100 lbs. per day	55 lbs. per day
Sulfur Oxides (SO_x)	150 lbs. per day	150 lbs. per day
Particulates (10 microns) (PM_{10})	150 lbs. per day	150 lbs. per day

CONSTRUCTION

Impact 7.5-1: The proposed improvements to OCSD's collection systems would generate short-term emissions of air pollutants, including dust and criteria pollutants, from excavation, installation and/or replacement activities. This is considered a short-term significant impact that would cease at the completion of construction activities. Construction emission impacts are estimated to occur for an average of three to four weeks within one block of any given property. Less than Significant with Mitigation Measures.

Implementation of the proposed improvements to OCSD's collection systems would involve two types of construction methods: 1) open trench method, which involves the removal of pavement and excavation of soil and pipes, and 2) jack-and-bore method for sensitive crossings, which involves the use of horizontal boring machine or auger to drill a hole and a hydraulic jack to push a casing through a hole; the pipeline is then installed in the casing.

The phasing of pipeline improvements would occur in periodic activity peaks, requiring brief periods of significant effort followed by longer periods of reduced activities. Collection systems construction would be on-going over the next 20 years consisting of intermittent periods of intensive construction activities and longer design periods. However, the majority of the construction activities are expected to occur by the year 2005.

Implementation of either construction method would require excavation activities and soil removal, which would generate short-term emissions of air pollutants, primarily dust and PM_{10} emissions. Since the final construction scheduling of specific trunk improvement projects has not yet been determined, emissions associated with construction equipment cannot be estimated. However, emission factors for typical construction equipment that may be used for general construction activities are shown in **Table 6.5-5**. Depending on the construction phase, the number of pieces of equipment used, and the duration of equipment use, air emissions associated with the operation of construction equipment may result in a significant short-term impact on air quality. As mentioned above, the majority of the proposed improvements would occur by the year 2005; therefore, the greatest quantity of associated emissions is anticipated to occur within this time period. Intermittent construction emission peaks would occur over the next 15 years as future projects are developed.

Dust emissions would vary according to the level and type of activity, silt content of the soil and prevailing weather. Total PM_{10} emissions associated with excavation of approximately 1,540,370 cubic yards of soil are estimated to be 25,210 pounds for the entire duration of construction. A maximum of 711 cubic yards of soil would be excavated for any project per day (based on the maximum pipe diameter of 120 inches with a trench width of 16 feet and a trench depth of 24 feet). Based on this figure, a maximum of 11.6 pounds of PM_{10} would be emitted from excavation activities for any improvement project, which would not exceed the threshold of significance of 150 pounds per day for each individual project.

However, construction-generated dust would temporarily contribute to the relatively high existing background PM_{10} levels. Excesses of the State ambient PM_{10} standard are typical in Orange County and construction-related dust would contribute to these excesses in the vicinity of each project alignment. Because PM_{10} thresholds are commonly exceeded in Orange County, project generated particulates would create a significant impact on sensitive land uses in the vicinity of the construction sites during the excavation and other pipeline improvements. These land uses include local residents, institutional uses, medical/convalescent facilities, and recreational uses situated along the alignments, as identified in Section 7.1.

Additionally, air emissions would result from haul truck trips associated with the removal of excavated earth from the construction sites. Total pollutant emissions generated by these haul

trucks for the entire construction period are estimated to be 45.1 tons of CO, 9.4 tons of ROC, 91.8 tons of NO_x, and 7.8 tons of PM_{10}. A maximum of 48 haul trucks would be required for any improvement project per day (based on 15 cubic feet per haul truck and a maximum of 711 cubic yards of soil, as discussed above); this would result in the daily emission of 42.1 pounds of CO, 8.8 pounds of ROC, 85.8 pounds of NO_x, and 7.3 pounds of PM_{10}, which would not exceed the thresholds of significance for all of the criteria pollutants if each improvement project is considered individually.

Similarly, air emissions would result from construction workers' trips. An average of 10 workers is estimated as the number of people per crew necessary to work on a given project. To estimate the air emissions associated with construction workers' trips, it was assumed that each construction worker would generate two trips per day and travel a distance of 20 miles per trip, resulting in a total of 400 vehicle miles per day. This results in the daily emission of approximately 2.4 pounds of CO, 0.2 pounds of ROC, 0.5 pounds of NO_x, and less than 0.1 pound of PM_{10}. These emissions, combined with the haul truck trip emissions, would not exceed the thresholds of significant for all of the criteria pollutants if each improvement project is considered individually.

The District's collection systems also include pump stations throughout its Service Area. As part of the Strategic Plan, four of its 21 pump stations would be improved with larger capacity pumps. Activities associated with these improvements are anticipated to generate minimal air emissions as they would not involve any excavation and grading nor generate a number of truck or construction worker's trips.

Improvements to the collection systems would involve a number of components, phases, and activities. Total emissions associated with project development, which would include emissions from haul trucks, construction worker trips, and excavation are anticipated to remain below the thresholds of significance for all the criteria pollutants if each improvement project is considered individually. The mitigation measures identified below would reduce emissions associated with construction activities to a less-than-significant level.

EIR-Identified Mitigation

Measure 7.5-1a: The District should require the contractors to implement a dust abatement program that would reduce fugitive dust generation to lessen impacts to nearby sensitive receptors. The dust abatement program shall include the following measures:

- Water all active construction sites at least twice daily.
- Cover all trucks having soil, sand, or other loose material or require all trucks to maintain at least two feet of freeboard.
- Apply water three times daily, or apply non-toxic soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.

- Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites.
- Sweep daily (with water sweepers) if visible soil material is carried into adjacent streets.
- Hydroseed or apply non-toxic soil stabilizers to inactivate construction areas (previously graded areas inactive for ten days or more).
- Water twice daily or apply non-toxic soil binders to exposed soil stockpiles.
- Limit traffic speeds on unpaved roads to 15 mph.

Measure 7.5-1b: Contractors should maintain equipment engines in proper working order and operate construction equipment so as to minimize exhaust emissions. Such equipment should not be operated during first or second stage smog alerts.

Measure 7.5-1c: During construction, trucks and vehicles in loading or unloading queues should be kept with their engines off, when not in use, to reduce vehicle emissions. Construction activities shall be discontinued during second-stage smog alerts.

Significance after Mitigation: Less than Significant.

OPERATION

Impact 7.5-2: Operation of the collection systems, including the sewer lines and the pump stations, is anticipated to generate minimal quantities of air pollutants. Less than Significant.

No emissions would result from the operation of sewer pipelines. The upgraded pump stations (Crystal Cove, Bitter Point, College Avenue, and Edinger) are anticipated to generate air emissions associated with energy use. However, this is not expected to generate a significant amount of air pollutants as the new pumps would not result in a substantial increase in energy usage.

Operation of the pump stations would continue to require employee trips for inspection and maintenance, however, no new trips are anticipated to be generated. Therefore, operation of the collection systems would not have a significant impact on air quality.

Mitigation Measures

No mitigation measures are necessary.

Impact 7.5-3: Operation of the collection systems could result in odor emissions. Less than Significant.

As previously discussed, the District has implemented an on-going odor control program since 1981. Similar to the treatment facilities, odor reduction in the collection systems has been a high priority for the District. Presently, existing trunk lines are treated with caustic soda as soon as two ppm of wet sulfides are detected in the wastewater; 12 sites are currently monitored once or twice a week for liquid total and dissolved sulfides, temperature, pH, headspace H_2S concentrations, and treatment with caustic soda is provided as required.

The District would continue this odor control effort to ensure that sewer odors in the communities served by the trunk lines and pump stations are minimized. Although occasional odor complaints cannot be totally eliminated, odor complaints associated with these stations would continue to be negligible. As a result, odor emissions associated with the operation of the collection systems are not anticipated to create a significant impact on air quality.

Mitigation Measures

No mitigation measures are necessary.

REFERENCES – AIR QUALITY

South Coast Air Quality Management District, *CEQA Air Quality Handbook*, April 1993.

County Sanitation Districts of Orange County, CA, *1998 Annual Report: Operations & Maintenance*, October 27, 1998.

7.6 GEOLOGY

7.6.1 SETTING

SOILS

The U.S. Soil Conservation Service completed a comprehensive soil survey of Orange County that identifies 49 soil types, which are subdivided into 226 individual soil names. Soils within the study area are characterized by alluvial fan and floodplain soils composed of various amounts of sand, silt, and clay.

SEISMICITY

Southern California is considered to be one of the most seismically active regions of the world. Over the years faults in the area have produced numerous moderate to large magnitude earthquakes (i.e., greater than 6 on the Richter scale). The major fault structures within Orange County are the San Andreas fault, San Jacinto fault, Whittier-Elsinore fault, Newport-Inglewood fault, and Palos Verdes fault (see **Figure 4-2**, Section 4.8, Geologic Hazards and Soils). Two fault zones of relevance to this project (due to the proximity to the project site) is the Newport Inglewood fault and the Whittier-Elsinore fault zones. Both fault zones have been designated as active by the California Department of Mines and Geology under the Alquist-Priolo Geologic Fault Zoning Act.[1]

Newport-Inglewood Fault

The Newport-Inglewood fault zone in the Los Angeles Basin consists of a series of short, discontinuous, northwest-trending right-lateral faults, relatively shallow anticlines and subsidiary normal and reverse faults extending approximately 36 miles from the Santa Monica Mountains to offshore Newport Beach. A segment of the fault zone also extends from Newport Beach to about 6 miles southeast of San Onofre. Few specific geological studies for the Newport-Inglewood fault zone have been conducted, but historical record has shown that potentially damaging earthquakes have occurred every few years. During the last 65 years, numerous earthquake shocks have occurred along the fault zone ranging from 3.0 to 5.0 on the Richter scale. The most damaging was the March 1933 Long Beach quake, with a magnitude of 6.3. Despite the lack of recent surface displacements of known faults along the zone and the absence of extensive damage in recent years, the fault zone is considered a significant potential hazard to the highly developed coastal area.

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[1] The purpose of this Act is to prohibit the placing of habitable structures across traces of active faults and thereby mitigate the hazards of surface fault rupture along earthquake faults considered to be "sufficiently active and well defined as to constitute a potential hazard to structures from surface faulint or fault creep."

Whittier-Elsinore Fault

The northwest trending Whittier-Elsinore fault zone extends approximately 185 miles from the Los Angeles Basin in Southern California southeasterly across the international border into Mexico as the Laguna Salada fault (OCWD and OCSD, 1998). This fault zone includes the Whittier fault, Glen Ivy fault, Wildomar fault, Julian fault, Coyote Mountain fault, and Laguna Salada fault extending into Mexico.

Groundshaking

Earthquakes in Orange County potentially could produce strong groundshaking in the project area. Groundshaking is partly related to the size of an earthquake, the distance from the epicenter, and the response of the geologic materials at the site. As a rule, the greater the earthquake magnitude and the closer the fault rupture to the site, the greater the intensity of groundshaking. Deep unconsolidated materials amplify earthquake waves. As discussed, the Newport-Inglewood fault and Whittier-Elsinore fault zones are known active faults within the project site.

Liquefaction

Liquefaction is the rapid transformation of saturated, loose, fine-grained sediment (such as silt and sand) to a fluid-like state because of earthquake groundshaking. As groundshaking induces a rapid rise in excess pore pressure and the soil loses its bearing strength, it may spread laterally, undergo settlement and form fissures and sand boils (upwellings of sand at the surface). Liquefaction has resulted in substantial loss of life and injury, plus damage to property, roads and infrastructure. In addition, liquefaction increases the hazards of fires because of explosions induced when underground gas lines break and because the breakage of water mains substantially reduces fire suppression capability.

The project site is characterized by sandy surface soils, underlying peat bog, and high water table, which are susceptible to liquefaction.

Settlement

Strong ground motions that occur during earthquakes are capable of inducing forms of adjustments. Settlement is the gradual downward movement of an engineered structure due to compaction of unconsolidated material below the foundation. Settlement accelerated by earthquakes could result in vertical or horizontal separations of structures or portions of one structure, cracked foundations, and in severe situations, building collapse and bending or breaking of underground utility lines.

7.6.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

Adverse impacts are considered significant if implementation of the project could subject people, structures or other resources to geologic or seismic hazards. A project would have a significant effect on the environment if it were to create the following conditions:

- Expose people or structures to major geologic hazards which include ground surface rupture, seismic groundshaking, ground failure (including liquefaction), landslides, subsidence, or expansive soils;
- Involve changes in topography that would result in unstable soil conditions; or
- Cause erosion or loss of topsoil.

OPERATION

Impact 7.6-1: Project facilities would be located in areas susceptible to primary and secondary seismic hazards (groundshaking, liquefaction, settlement). Damage to facilities could result in the event of a major earthquake. Less than Significant with Mitigation Measures.

Project facilities are located in a region of seismic activity and would be subject to seismic hazards. Potential damage to pipelines include rupture and subsequent underground and surface spillage of raw sewage. Damages to pipelines are unlikely to result from liquefaction and settlement, since the pipelines would be installed within consolidated, engineered backfill. Pipeline replacement and rehabilitation is likely to improve the seismic reliability of the existing pipelines. Therefore, project implementation may have a positive impact. However, pipeline rupture may result from groundshaking. This impact can be mitigated if design and construction of the pipelines are in accordance with current engineering practices, including the California Building Code, OCSD specifications and requirements, and all applicable seismic engineering guidelines. Impacts would be reduced to a less-than-significant level.

The District has implemented an Integrated Emergency Response Program (IERP) covering worker safety, spill prevention, emergency response, and hazardous materials management. Should a spillage occur, the District would take the appropriate measures to minimize public hazard.

District-Proposed Mitigation

Measure 7.6-1a: The District will design and construct new facilities in accordance with District seismic standards and/or meet or exceed seismic, design standards in the most recent edition of the California Building Code.

Measure 7.6-1b: Soils surveys shall be conducted to determine the liquefaction potential along the collection system improvements route.

Significance after Mitigation: Less than significant.

REFERENCES – GEOLOGY

California Department of Conservation, Division of Mines and Geology, *Fault-Rupture Hazard Zones in California*, Revised 1997.

CSDOC Wastewater Management Program, *Draft Environmental Impact Statement*, March 1977.

CSDOC, *Operations and Maintenance Annual Report,* 1998.

Orange County Water District and the Orange County Sanitation District, *Draft Program EIR/Tier 1 EIS, Groundwater Replenishment System*, November 1998.

7.7 HYDROLOGY AND WATER RESOURCES

7.7.1 SETTING

SURFACE WATER/FLOODING

Surface flows in the project area include the Santa Ana River and its tributaries. The Santa Ana River and its tributaries drain the southern portion of the eastern San Gabriel Mountains and the southern parts of the San Bernardino Mountains. Surface water and groundwater in the upper basin flow through Prado Dam, at the head of the Santa Ana River Canyon, and down to the Orange County coastal basin.

The discussion of regional flooding in Chapter 4.0 is also applicable to the collection system project sites since many are located within northern Orange County. **Figure 4-4** (in Section 4-9, Hydrology and Water Resources) identifies the area within northern Orange County that is susceptible to 100-year flood and Standard Project Flood.

GROUNDWATER

There are two distinctively separated major water-bearing formations in the study area: the Coastal Plain Basin (i.e., that portion of the coastal plain basin situated within Orange County) and the La Habra Basin. The Coastal Plain Basin is divided into six subareas: the Yorba Linda Subarea, Santa Ana Narrows Subarea, the Santa Ana Forebay Subarea, the Santiago Subarea, the Irvine Subarea, and the East Coastal Plain Pressure Subarea.

The local water supply is largely dependent upon the safe yield of the groundwater basin. The Orange County Groundwater Basin is affected by natural and artificial factors. Natural hydrologic conditions, such as rainfall, seepage from underground reservoirs and other groundwater basins and streams, as well as extraction wells and recharge using imported supplies and water conservation practices influence groundwater levels and quality.

Most of the water pumped from groundwater sources is used for municipal and industrial purposes. OCWD purchases non-local water for groundwater replenishment. Non-local waters are defined as those purchased from agencies outside OCWD's Service Area or flows diverted from Santiago Creek. The majority of the supplemental non-local water was imported from the Colorado River or State Water Project purchased from the Metropolitan Water District (MWD) for use at the Anaheim Recharge Facility (OCSD and OCWD, 1998).

It is estimated that the volume of groundwater stored in the basin decreased by 20,000 (acre-feet) AF for the water year 1996-1997 (OCWD and OCSD, 1998). Approximately 54,459 AF of replenishment water was percolated or injected to recharge the groundwater basin. The total annual overdraft of the basin for the water year 1996-1997 was approximately 74,459 AF.

Water quality during water year 1996-1997 for the average total dissolved solids (TDS) of Orange County groundwater was 466 milligrams per liter (mg/L) (OCWD and OCSD, 1998). Water extracted from coastal wells not affected by seawater intrusion tended to be of higher quality, ranging from about 232 to 320 mg/L TDS. The TDS levels of inland wells in the Anaheim, Fullerton and Yorba Linda areas generally exceeded 600 mg/L. The average nitrate-nitrogen concentration of the Orange groundwater basin was 2.4 mg/L. Samples taken during the year from various wells ranged from 0.0 to 8.0 mg/L nitrate-nitrogen .

A more detailed description of groundwater in the Orange County area may be found in the 1977 Wastewater Management Program EIS and the 1998 Orange County Water District Draft Program EIR/Tier 1 EIS for Groundwater Replenishment System.

STORM DRAINAGE

Storm drains within the study area are owned and maintained by the cities in which they are located. These municipal storm drains eventually drain into County flood control channels own and maintained by the Orange County Flood Control District (Linstrom, 1999).

SALT WATER INSTRUSION BARRIER

There are four areas along the coastline where geologic continuity exists between the ocean and the Orange County groundwater basin: the Santa Ana (Talbert Gap), Bolsa-Chica, Bolsa-Sunset, and Alamitos gaps. The Santa Ana and Alamitos gaps have experienced significant saltwater intrusion. Based on geologic information, the remaining gaps appear to be sealed from direct ocean flows by the Newport-Inglewood Fault. Over the years, steps have been taken to protect the groundwater. These actions include the County's use of water injection well as saltwater intrusion barriers and the proposed Groundwater Replenishment System.

EXISTING RECLAMATION PRACTICES

To meet growing regional water demands to support seawater intrusion barrier injection systems, groundwater replenishment, irrigation, and other commercial and industrial needs, water importation and future reclamation would be necessary. As previously mentioned in Section 4.9, reclamation is practiced by OCWD at Water Factory 21 (WF-21, located in Fountain Valley, California, adjacent to the Reclamation Plant No. 1) and Irvine Ranch Water District (IRWD). WF-21 consists of an advanced wastewater treatment process that includes reverse osmosis and granular activated carbon treatment to yield a product water that meets drinking water standards. Product water is then blended with water from deep wells to provide an adequate volume of injection water.

The Green Acres Project (GAP) has supplied reclaimed water to several Orange County cities for landscape irrigation, industrial applications and toilet flushing. The GAP facilities produce non-potable, tertiary treated, recycled water through a process that includes flocculation, filtration and chlorine disinfection. In 1997, OCSD sent approximately 2.4 mgd to WF-21 and about 6.1 mgd

to GAP; of this total, around 1 mgd of WF-21/GAP process waste backwash water was returned to OCSD for treatment and disposal.

FUTURE RECLAMATION PRACTICES

The OCWD has proposed a Groundwater Replenishment System (GWR) as a new water resource for the County to satisfy future water needs. The program would provide water for recharging the Orange County Groundwater Basin, additional reclaimed water for injecting into the barrier that protects the groundwater basin from seawater intrusion, and for supplementing non-potable water deliveries during peak summer months from the GAP (OCWD and OCSD, 1998). The GWR System would enable OCSD and OCWD to address the issue of groundwater recharge on a regional scale. Microfiltration and reverse osmosis are the basic processes that would be used to produce the reclaimed water. The GWR System treatment facilities would be located on existing properties in the City of Fountain Valley owned by OCWD and OCSD. Using an alignment that generally parallels the Santa Ana River channel, the reclaimed water would be pumped to existing spreading basins at the Anaheim Forebay where the water would recharge underground freshwater aquifers. GWR System water would also integrate the present WF-21 activities into its operations. The GWR System would support the following uses: residential, commercial/ industrial, agricultural, recreation, and habitat restoration/enhancement.

See Section 4.9, Regional Setting for further discussion.

7.7.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

The impacts of a project would be a significant impact on the environment if it:

- Substantially degrade water quality, contaminate a public water supply;
- Substantially degrade or deplete water resources; or
- Substantially alter the existing drainage pattern of the area in a manner which would result in flooding, erosion or siltation on- or off-site.

CONSTRUCTION AND OPERATION

Impact 7.7-1: Construction activities could result in erosion and siltation into nearby surface waters, leading to degradation of water quality or flooding hazards. Construction could also result in chemical spills (e.g., fuels, oils, or grease) to stormwater, and increase turbidity and decrease water quality in waters of the U.S. Less than Significant with Mitigation Measures.

The proposed pipeline replacement and rehabilitation projects are scattered throughout northern Orange County. Projects are located in the vicinity of, or parallel and cross the Santa Ana River,

Anaheim Wetlands, and numerous unnamed flood control channels. Construction activities involving soil disturbance, such as excavation, stockpiling, and grading could result in increased erosion and sedimentation to surface waters. Erosion and sedimentation to the channels could degrade water quality or decrease the capacity of flood control channels to convey stormwater flows, thereby increasing the risk of flooding. Where construction activities are adjacent to a waterway, hazardous materials released from equipment or other materials may also degrade water quality if accidentally spilled.

The potential for erosion and accidental chemical spills is readily mitigated with implementation of standard construction practices, such as implementation of Best Management Practices and development of a Spill Prevention, Control, and Countermeasure Plans. Measures provided below would minimize impacts to a less-than-significant level.

District-Proposed Mitigation

Measure 7.7-1a: Construction contractors will implement Best Management Practices to prevent erosion and sedimentation to avoid significant adverse impacts to surface water quality.

EIR-Identified Mitigation

Measure 7.7-1b: In addition, open-trench installation of pipelines across open drainage channels and the interplant connector should be limited to the dry season.

Measure 7.7-1c: The District should coordinate with the Orange County Public Facilities and Resources Department (Orange County Flood Control District) Planning Section to ensure compatibility and joint use feasibility with existing and future projects.

Measure 7.7-1d: The District should incorporate into contract specifications the requirement that the contractor(s) enforce strict on-site handling rules to keep construction and maintenance materials out of receiving waters. The rules will include measures to:

- Store all reserve fuel supplies only within the confines of a designated construction staging area.
- Refuel equipment only within designated construction staging area.
- Regularly inspect all construction vehicles for leaks.

Measure 7.7-1e: The District should incorporate into contract specifications the requirement that the contractor(s) prepare a Spill Prevention, Control, and Countermeasure Plan. The plan would include measures to be taken in the event of an accidental spill.

Measure 7.7-1f: The District should incorporate into contract specifications the requirement that the construction staging areas be designed to contain contaminants such as oil, grease, and fuel products so that they do not drain towards receiving waters or storm drain inlets. If heavy-duty construction equipment is stored overnight adjacent to a potential receiving water, drip pans will be placed beneath the machinery engine block and hydraulic systems.

Measure 7.7-1g: The District will contact the Orange County Flood Control District prior to excavation activities involved with the construction of the interplant connector to ensure the integrity of the flood control system along the Santa Ana River.

Significance after Mitigation: Less than Significant.

REFERENCES – HYDROLOGY AND WATER RESOURCES

Boyles, Don, Water Superintendent, City of Fullerton, Personal Communication.

Burke, Ray, Senior Civil Engineer, City of Santa Ana, Water Department, Personal Communication.

CSDOC Wastewater Management Program, *Draft Environmental Impact Statement*, March 1977.

CSDOC, *Operations and Maintenance Annual Report 1998.*

Fowler, Chuck, Water Quality Inspector, City of Buena Park, Personal Communication.

Gomez, Art, Customer Service Superintendent, Southern California Water Company, Personal Communication.

Miller, Scott, City of Westminster Water Department, Personal Communication.

Moody, Richard, Water Supervisor, City of La Habra, Personal Communication.

Orange County Water District and the Orange County Sanitation District, *Draft Program EIR/Tier 1 EIS, Groundwater Replenishment System*, November 1998.

Pichey, Janet, Water Engineer, City of Orange Water Department, Personal Communication.

Valenzuela, Art, Water Quality Supervisor, City of Tustin Water Service Department, Personal Communication.

Zamudio, Miguel, Waste Management, Personal Communication.

Zazaleta, Clara, Waste Management, Personal Communication.

7.8 PUBLIC SERVICES AND UTILITIES

7.8.1 SETTING

Table 7.8-1 shows the public service and utility providers for each city in the project area. The collection system pipeline would be constructed adjacent to and perpendicular to existing underground and above-ground utilities. These utilities include water services, storm drains, aboveground and underground gas and electric power lines. Water services are provided by municipalities who generally receive water from local groundwater sources or the Metropolitan Water District (MWD). Storm drains within the study area are owned and maintained by the cities in which they are located. These municipal storm drains eventually drain into County flood control channels own and maintained by the Orange County Flood Control District (Linstrom, 1999). Electrical and natural gas transmission lines for the most cities in the project area are owned and operated by Southern California Edison and the Southern California Gas Company, respectively. The City of Anaheim owns and operates electrical utilities within the City of Anaheim

Fire protection and paramedic services to the area affected by the project are provided by local fire departments and the Orange County Fire Authority. Ambulance service is also provided in most areas by privately operated companies. Similar to fire protection, police protection services are provided by local police departments. The cities of Stanton and Villa Park are served by the Orange County Sheriff. Fire protection and police protection services for these cities are also provided on a mutual assistance basis whereby crews from one jurisdictional areas would respond to emergencies in adjacent jurisdictions, if necessary.

7.8.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

The potential impacts of the collection system on public services were evaluated based on the nature and existing availability of public services provided in the project area and the potential impacts the proposed collection system improvements would likely have on these public services. The impacts of a project on public services were considered to be significant if they resulted in:

- breach published, national, state, or local standards related to interfering with emergency services and response plans; or
- causes a substantial increase in the demand for any public service or utility facilities.

CONSTRUCTION

Impact 7.8-1: Construction of the collection pipeline system could result in short-term disruption of emergency services in the vicinity of the project area. Less than significant with Mitigation Measures.

Potential impacts to fire, police and emergency medical services from construction of the proposed project are expressed in increased response times due to restricted vehicular access on roadways. Access to emergency facilities (e.g., the Fountain Valley Regional Hospital located on Euclid Street in the City of Fountain Valley, and the fire station on Gillette Avenue) must be available 24-hours a day. The potential for blocking emergency equipment access would be avoided through advanced planning with emergency vehicle providers.

Additionally, vandalism may increase in areas where construction equipment and materials are stored. Implementation of the mitigation measures identified below would reduce construction impacts on public services to a less-than-significant level.

EIR-Identified Mitigation

Measure 7.8-1a: The contractor should provide a copy of the Traffic Control Plan to the Sheriff's Department local police departments and fire departments prior to construction. The District should provide 72-hour notice of construction to the local service providers of individual pipeline segments.

Measure 7.8-1b: Access to fire stations and emergency medical facilities must be maintained on a 24-hour basis and at least one access to medical facilities should be available at any one time during construction. The District should notify appropriate officials at the medical facility regarding construction schedule.

Measure 7.8-1c: Trenches should be promptly backfilled after pipeline installation. If installation is incomplete, steel trench plates should be used to cover open trenches.

Significance after Mitigation: Less than Significant.

Impact 7.8-2: Construction of the collection system projects would create a public safety hazard in the vicinity of the construction area. Less than Significant with Mitigation Measures.

Construction of the collection pipeline system would involved trenching within the public right-of-way. Trench width would range from four feet to 16 feet depending on the size of the sewer being replaced. Trench depth would range from 14 to 24 feet. The active work area along the open trench would extend about 5 to 10 feet on one side of the trench and 20 to 30 feet to the other side, allowing for access by trucks and loaders. The minimum construction right-of-way would be 25 feet; the maximum construction easement would be 50 feet. Jacking pits for the pipeline would be approximately 50 feet by 20 feet; the temporary pits typically would be excavated to a depth of 50 feet. Other construction activities include open manholes during manhole rehabilitation. The potential for persons to enter the construction areas during construction could represent a public safety hazard. Implementation of the mitigation measures identified below and **Measure 3.8-1c**, above, would reduce impacts to public safety to a less-than-significant level.

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TABLE 7.8-1
PUBLIC SERVICE & UTILITY PROVIDERS IN THE PROJECT AREA

Public Service Utility	Anaheim	Brea	Buena Park	Costa Mesa	Cypress	Fountain Valley	Fullerton	Garden Grove	Huntington Beach	Irvine	La Habra	La Palma	Los Alamitos	Newport Beach	Orange	Placentia	Santa Ana	Seal Beach	Stanton	Tustin	Villa Park	Westminster	Yorba Linda
Fire	City of Anaheim Fire Dept.	City of Brea Fire Dept.	OCFA	City of Costa Mesa Fire Dept.	OCFA	City of Fountain Valley Fire Dept.	City of Fullerton Fire Dept.	City of Garden Grove Fire Dept.	City of Huntington Bch. Fire Dept.	OCFA	City of La Habra Fire Dept.	OCFA	OCFA	City of Newport Bch. Fire Dept.	City of Orange Fire Dept.	OCFA	City of Santa Ana Fire Dept.	OCFA	OCFA	OCFA	OCFA	OCFA	OCFA
Police	City of Anaheim Police Dept.	City of Brea Police Dept.	City of Buena Park Police Dept.	City of Costa Mesa Police Dept.	City of Cypress Police Dept.	City of Fountain Valley Police Dept.	City of Fullerton Police Dept.	City of Garden Grove Police Dept.	City of Huntington Bch. Police Dept.	City of Irvine Police Dept.	City of La Habra Police Dept.	City of La Palma Police Dept.	City of Los Alamitos Police Dept.	City of Newport Bch. Police Dept.	City of Orange Police Dept.	City of Placentia Police Dept.	City of Santa Ana Police Dept.	City of Seal Bch. Police Dept.	Orange County Sheriff Dept.	City of Tustin Police Dept.	Orange County Sheriff Dept.	City of Westminster Police Dept.	City of Brea Police Dept.
Water	MWD City of Anaheim	MWD CA Domestic Water Company	MWD City of Buena Park	MWD City of Costa Mesa	Southern CA Water Company	MWD City of Fountain Valley	MWD City of Fullerton	MWD City of Garden Grove	City of Huntington Bch.	Irvine Ranch Water District	City of La Habra CA Domestic Water System	MWD City of La Palma	Southern CA Water Company	MWD Orange County Water District	MWD City of Orange	Southern CA Water Company	MWD City of Santa Ana	Southern CA Water Company	Southern CA Water Company	MWD City of Tustin	Serrano Water District	MWD City of Westminster	Southern CA Water Company
Storm Drainage	City of Anaheim	City of Brea	City of Buena Park	City of Costa Mesa	City of Cypress	City of Fountain Valley	City of Fullerton	City of Garden Grove	City of Huntington Bch.	City of Irvine	City of La Habra	City of La Palma	City of Los Alamitos	City of Newport Bch.	City of Orange	City of Placentia	City of Santa Ana	City of Seal Bch.	City of Stanton	City of Tustin	City of Villa Park	City of Westminster	City of Yorba Linda
Gas	SCG	SCG	SCG	SCG	SCG	SCG	SCG	SCG	SCG	SCG	SCG	SCG	SCG	SCG	SCG	SCG	SCG	SCG	SCG	SCG	SCG	SCG	SCG
Electric	City of Anaheim SCE	SCE	SCE	SCE	SCE	SCE	SCE	SCE	SCE	SCE	SCE	SCE	SCE	SCE	SCE	SCE	SCE	SCE	SCE	SCE	SCE	SCE	SCE

OCFA Orange County Fire Authority
MWD Metropolitan Water District
SCE Southern California Edison
SCG Southern California Gas

EIR-Identified Mitigation

Measure 7.8-2a: Construction contractors should ensure that adequate barriers would be established to prevent pedestrians from entering open trenches of an active construction area. Warnings shall also be posted sufficient distances from the work area to allow pedestrians to cross the street at controlled intersections rather than having to jaywalk.

Measure 7.8-2b: Construction contractors should be responsible for providing appropriate security measures, including the provision of security guards, for all equipment staging and/or storage areas needed for the project.

Measure 7.8-2c: Construction contractors should dispose of construction refuse at approved disposal locations. Contractors should not be permitted to dispose of construction debris in residential or business containers.

Significance after Mitigation: Less than Significant.

Impact 7.8-3: Construction of the collection pipeline system could result in short-term disruption of utility service and may require utilities relocation. Less than Significant with Mitigation Measures.

Utility services could be disrupted as a result of project construction. Impacts to utilities is considered significant if construction resulted in direct or possibly lengthy disruption of essential utility services. During construction, utility lines for water, electricity, natural gas, and telephone, would be protected in place or relocated to ensure continued service to residences and businesses. All utility lines and cables which would be disrupted during pipe installation would be identified during preliminary design for all components.

Mitigation measures identified below would reduce construction impacts to utility services to less than significant.

EIR-Identified Mitigation

Measure 7.8-3a: A detailed study identifying utilities along the pipeline routes should be conducted during the design stages of the project. For segments with adverse impacts the following mitigations should be implemented.

- Utility excavation or encroachment permits shall be required from the appropriate agencies. These permits include measures to minimize utility disruption. The District and its contractors should comply with permit conditions and such conditions should be included in construction contract specifications.
- Utility locations should be verified through field survey .
- Detailed specifications should be prepared as part of the design plans to include procedures for the excavation, support, and fill of areas around utility cables and pipes.

All affected utility services would be notified of the District's construction plans and schedule. Arrangements should be made with these entities regarding protection, relocation, or temporary disconnection of services.

Measure 7.8-3b: In order to reduce potential impacts associated with utility conflicts, the following measures should be implemented in conjunction with 7.8-3a.

- Disconnected cables and lines would be promptly reconnected.
- The District shall observe Department of Health and Safety (DHS) standards which require a 10-foot horizontal separation between parallel sewer and water mains; (2) one foot vertical separation between perpendicular water and sewer line crossings. In the event that the separation requirements cannot be maintained, the District shall obtain DHS variance through provisions of water encasement, or other means deemed suitable by DHS; and (3) encasing water mains in protective sleeves where a new sewer force main crosses under or over an existing sewer main.

Measure 7.8-3c: The construction contractor should comply with District requirements and specification to protect existing utility lines.

Measure 7.8-3d: The District should coordinate with the Orange County Public Facilities Resources Department, Orange County Flood Control District, Planning Section to ensure compatibility and joint use feasibility with existing and future projects.

Significance after Mitigation: Less than Significant.

OPERATION

The collection pipeline system would be operated underground and would not require public services. No operational impacts to public services and/or utilities are anticipated as a result of the proposed project.

Mitigation Measures

No mitigation measures required.

REFERENCES – PUBLIC SERVICES AND UTILITIES

Allevato, Sam, Watch Commander, City of Garden Grove Police Department, Personal Communication.

Arnold, Bill, Watch Commander, City of Los Alamitos, City of Los Alamitos Police Department, Personal Communication.

Barnett, Brad, Captain, City of Santa Ana Fire Department, Personal Communication.

Boston, Donna, Emergency Service Coordinator, City of Newport Beach Fire Department, Personal Communication.

Boyles, Don, Water Superintendent, City of Fullerton, Personal Communication.

Burke, Ray, Senior Civil Engineer, City of Santa Ana, Water Department, Personal Communication.

Caracci, Senior Officer, City of Fullerton Police Department, Personal Communication.

Chidester, Battalion Chief, City of Fullerton Fire Department, Personal Communication.

Conkle, Boyd, Production Superintendent, City of Garden Grove, Personal Communication.

CSDOC Wastewater Management Program, *Draft Environmental Impact Statement*, March 1977.

CSDOC, *Operations and Maintenance Annual Report 1998.*

Deutsch, Tim, City of Newport Beach Public Works Department, Personal Communication.

Dix, Russell, Briggman Disposal, Personal Communication.

Eldridge, Miriam, General Services Representative, City of Newport Beach, Personal Communication.

Flake, Chuck, Captain, City of La Habra Fire Department, Personal Communication.

Fowler, Chuck, Water Quality Inspector, City of Buena Park, Personal Communication.

Garcia, Joe, Traffic Commander, City of Tustin Police Department, Personal Communication.

Gomez, Art, Customer Service Superintendent, Southern California Water Company, Personal Communication.

Gray, Christian, Engineering Manager, City of Yorba Linda, Personal Communication.

Hamilton, Paul, Street Supervisor, City of La Habra, Personal Communication.

Hienecke, Fred, Watch Commander, City of Newport Beach Police Department, Personal Communication.

Jerusic, Captain, City of Santa Ana Police Department, Personal Communication.

Johansen, Chris, City Engineer, City of Westminster, Personal Communication.

Lucenta, Sgt., Watch Commander, City of Buena Park Police Department, Personal Communication.

Machizaki, Doug, City of Orange Fire Department, Personal Communication.

Martinez, Lui, Irvine Ranch Water District, Personal Communication.

Masena, Mike, Lt., City of Brea Police Department, Personal Communication.

Miller, Scott, City of Westminster Water Department, Personal Communication.

Mittelstaedt, Mike, Watch Commander, City of Westminster Police Department, Personal Communication.

Morales, Richard, Master Officer II, City of Garden Grove Fire Department, Personal Communication.

Moody, Richard, Water Supervisor, City of La Habra, Personal Communication.

Motsinger, Dave, Operations Manager, CC&R, Inc., Personal Communication.

Noorbaksh, Ismile, City Engineer, City of La Habra, Personal Communication.

Oliver, John, Service Analyst, City of Brea Public Works Department.

Olson, Tim, Watch Commander, City of Seal Beach Police Department, Personal Communication.

Orange County Water District and the Orange County Sanitation District, *Draft Program EIR/Tier 1 EIS, Groundwater Replenishment System*, November 1998.

Pargee, Dave, Fire Administrative Trainee, City of Brea Fire Department, Personal Communication.

Palmer, Michele, Senior Fire Communications Supervisor, Orange County Fire Authority, Personal Communication.

Pedroza, George, City of Orange Public Works Department, Personal Communication.

Phillips, Cameron, Operations Chief, City of Garden Grove Fire Department, Personal Communication.

Pichey, Janet, Water Engineer, City of Orange Water Department, Personal Communication.

Pine, Sgt, Watch Commander, City of Orange Police Department, Personal Communication.

Reese, John, Police Chief, City of La Habra Police Department, Personal Communication.

Reynolds, Matt, Technical Service Manager, City of Placentia Police Department, Personal Communication.

Round, Lanette, Public Information Coordinator, Mesa Consolidated Water District, Personal Communication.

Sheackelford, Dan, Accounting Rate Supervisor, City of Anaheim Police Department, Personal Communication.

Skinner, Jill, Operation Secretary, City of Anaheim Fire Department, Personal Communication.

Riley, Battalion Chief, City of Costa Mesa Fire Department, Personal Communication.

Thompson, Loise, Costa Mesa Sanitation District, Personal Communication.

Truadeau, Sgt., Assistant Watch Commander, Orange County Sheriff Department, Personal Communication.

Valenzuela, Art, Water Quality Supervisor, City of Tustin Water Service Department, Personal Communication.

Vazquez, Gonzalo, Environmental Affairs Officer, Southern California Water Company, Personal Communication.

Wong, Jeff, Watch Commander, City of Cypress Police Department, Personal Communication.

Yakiyama, Sgt, Emergency Coordinator, City of La Habra Police Department, Personal Communication.

Zamudio, Miguel, Waste Management, Personal Communication.

Zazaleta, Clara, Waste Management, Personal Communication.

7.9 AESTHETICS

7.9.1 SETTING

The character of the collection system pipeline replacement corridors vary from urban to open space. The pipeline would be located within developed city streets which are graded and paved. Street alignments are developed with trees and landscaped vegetation. Nearly 47 miles of pipeline replacements would be located within primarily collector and arterial roadways, some of which have raised landscaped median strips and/or curbs. Pipeline replacement corridors may be seen from residential neighborhoods, housing developments, schools, commercial and industrial centers, roadways, and recreation and open space land uses.

7.9.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

A project would be considered to have a significant impact if it would have a substantial, demonstrable negative aesthetic effect. A negative effect could occur if the project caused substantial alterations to or contrasted with existing visual resources with adverse viewer response. An impact would also be considered significant if the project conflicted with an adopted policy regarding aesthetics and visual resources. The significance of impacts related to the visual quality of the environment is analyzed from two perspectives: the temporary impacts of construction activities and the long-term impacts associated with operation.

CONSTRUCTION

Impact 7.9-1: Project implementation could result in short-term visual impacts resulting from construction activities. Less than Significant after Mitigation Measures.

The collection system improvements are divided into three categories: pipeline replacements, rehabilitation of manholes and pipelines, and pump station improvements. The collection system improvements are primarily located within collector and arterial roadways that possess landscaped median strips and/or landscaped right-of-ways. The removal of aesthetic features, such as landscaping, during construction could cause a temporary degradation of visual resources that may be significant. However, it is unlikely that existing pipelines are located underneath such features.

Excavated trenches and stockpiled soils, pipe, and other materials within the construction easement would constitute negative aesthetic features to the pipeline alignment. This would be a temporary adverse impact and would be considered less than significant.

EIR-Identified Mitigation

Measure 7.9-1a: The District should ensure that its contractors restore disturbed areas along the pipeline alignment to their pre-project condition such that short-term construction disturbance does not result in long-term visual impacts.

Measure 7.9-1b: Construction contractors should be required to keep construction and staging areas orderly, free of trash and debris.

Significance after Mitigation: Less than Significant.

OPERATION

The sewer pipelines would be located entirely below grade and would be unobtrusive. Therefore, operation of the collection system is not have a significant aesthetic impact.

Mitigation Measures

No mitigation measures are required.

REFERENCES – AESTHETICS

CSDOC Wastewater Management Program, *Draft Environmental Impact Statement*, March 1977.

CSDOC, *Operations and Maintenance Annual Report,* 1998.

Orange County Water District and the Orange County Sanitation District, *Draft Program EIR/Tier 1 EIS, Groundwater Replenishment System*, November 1998.

7.10 CULTURAL RESOURCES

7.10.1 SETTING

As described in Section 4-11 of Chapter 4.0, Regional Setting, Archaeological Resource Management Corporation (ARMC) conducted a cultural resources assessment of the project area in which Orange County Sanitation District's (OCSD) proposed pipeline rehabilitation and replacement projects would occur. The purpose of the study was to identify any known cultural resources that could be affected by the proposed improvements. The cultural resources study was based on a records and literature review of South Central Coastal Information Center (SCCIC) files at the University of California at Los Angeles and ARMC Archives for Orange County. Field studies were not deemed necessary, since each of the proposed pipeline and replacement projects would occur within paved streets or in other previously disturbed areas.

SCCIC survey reports were reviewed for all areas within a one-quarter mile radius of the proposed collection system improvements. Information from SCCIC's survey reports, including archaeological sites, were mapped on USGS quadrangle sheets. These sheets have not been included in this EIR so as to protect the location of discovered resources. SCCIC surveys of Orange County are herein denoted by the letters "OR" followed by a number.

Historic maps were also reviewed to identify resources that may have attracted native inhabitants in the prehistoric period and to look for early historic developments. The following USGS 15-minute maps were reviewed: Anaheim 1896 and 1942; Downey 1896, 1923, and 1943; Las Bolsas 1894 and 1941; and Santa Ana 1894, 1901 (reprinted in 1945).

The Federal Register, National Register of Historic Places (NRHP), and California Registers under the Department of Parks and Recreation (State Historic Landmarks, Points of Historical Interest) and Office of Historic Preservation (Historic Resources Inventory, or HRI) were also consulted for listings of historic properties within one-quarter mile radius of each of the project components.

The records and literature search resulted in a series of observations related to prehistoric and early historic land uses for the various project components. Known prehistoric archaeological resources are identified in **Table 7.10-1** and discussed below. See **Figure 3-13** in the Project Description and **Maps A1** through **A12** in the Map Appendix for the locations of the proposed collection system improvements.

SANTA ANA RIVER TRUNK SEWER SYSTEM

Santa Ana River Interceptor Relief-A and B and Lower SARI Interceptor Improvements (Project Nos. 20, 25, and 27)

The proposed Santa Ana River Interceptor pipeline improvements would follow La Palma Avenue from Huxford Lane along the Santa Ana River to the Atchison, Topeka & Santa Fe

TABLE 7.10-1
PREVIOUSLY RECORDED PREHISTORIC ARCHAEOLOGICAL RESOURCES WITHIN A ONE-QUARTER MILE RADIUS OF PROPOSED COLLECTION SYSTEM IMPROVEMENTS

Proposed Project	Site Identification	Approximate Distance from Project Construction
Santa Ana River Trunk Sewer System		
Santa Ana Interceptor Improvements	CA-ORA-277	0 feet (on alignment)
Gisler-Redhill Trunk Sewer System		
Gisler-Redhill/North Trunk Improvements	CA-ORA-301[a]	not available
Gisler-Redhill System Improvements	CA-ORA-300	400 feet to the southeast
	CA-ORA-352	0 feet (on alignment)
	CA-ORA-353	130 feet to the southeast
	CA-ORA-381	260 feet to the southeast
Knott Trunk Sewer System		
West Side Relief Interceptor Improvements	CA-ORA-1352	660 feet to the west
Warner Avenue Relief Sewer	CA-ORA-83	0 feet (on alignment)
	CA-ORA-86	0 feet (on alignment)
	CA-ORA-144	0 feet (on alignment)
	CA-ORA-84	1,320 feet to the south
	CA-ORA-289	1,320 feet to the south
	CA-ORA-85 [a]	0 feet (on alignment)
	CA-ORA-87 [a]	1,320 feet to the north
	CA-ORA-288	400 feet to the south

[a] Indicates presence of buried remains.

Railroad line, where it crosses the river. At that point, the pipeline improvements would continue along the Santa Ana River channel until reaching the Southern Pacific Railroad crossing. These improvements would occur in the Cities of Anaheim and Orange. The 1896 Anaheim USGS quad sheet shows little development on either side of the Santa Ana River. Several primary roads were in place, including what is now Santa Ana Canyon Road (Route 18), following the route of the Santa Ana Valley Canal, and Orangethorpe Avenue/Placentia Yorba Road. The Atchison, Topeka & Santa Fe Railroad (San Bernardino Branch) passed through this area. There were a few structures on either side of the river from earlier development, principally on the north side. South of the City of Orange (founded in 1888) was the community of Orange Station and the City of Santa Ana (founded 1886).

By 1942, additional development had occurred on both sides of the Santa Ana River. Primary roads included Route 22, Route 55, Route 18, and Route 14. Route 101 (now the Santa Ana Freeway) followed the right-of-way of the Southern Pacific Railroad (Santa Ana Branch). The Pacific Electric Railroad line crossed the river to the west of the City of Santa Ana. Both the City of Santa Ana and the City of Orange had moderate street grids in place at that time.

Of the 13 archaeological surveys conducted by SCCIC within a one-quarter mile radius of the project (Survey Reports OR-801, -112, -270, -557, -999, -550, -1291, -308, -1734, -1596, -1661, -1634; and ARI), only one prehistoric archaeological site (Site CA-ORA-277) and one historic archaeological site (CA-ORA-857H) have been recorded.

CA-ORA-277 is recorded as a buried site (40' deep) that contained artifacts (stone bowls, pestles, a cog stone) associated with the Millingstone culture (McKinney, 1970). CA-ORA-857H is recorded as the site of three Yorba family properties: the Yorba Cemetery, the oldest cemetery (1858) in Orange County except for San Juan Capistrano; the Bernardo Yorba Hacienda (Ranchhouse); and the San Antonio de Padua de Santa Ana Chapel (Douglas 1980). They are located within a few hundred yards of each other at the corner of Esperanza Road and Echo Hill Lzane in the City of Yorba Linda. A commemorative marker is placed at the hacienda location.

Taft Branch Improvements (Project No. 2)

The Taft Branch Improvements Project would occur under Meats Avenue, Tustin Avenue and Taft/Candelwood Avenue in the City of Orange. The 1896 Anaheim USGS quad sheet shows little development in this area. The Town of Olive was settled to the north, the City of Orange had been founded (1888) to the south, and the City of Anaheim had been founded (1878) to the west. A few improved roads were present in the project vicinity. The Atchison, Topeka, & Santa Fe Railroad crossed the project area, and the Southern Pacific Railroad passed just to the south. By 1942, the area had a moderate street grid in place in the City of Orange. Route 55 (Newport Freeway) passed to the north and crossed the Santa Ana River.

No prehistoric or historic sites were recorded within a one-quarter mile radius of this project in the two archaeological surveys completed by SCCIC. Similarly, no listings of historic properties on either Federal or State registers were found within a one-quarter mile radius.

Carbon Canyon Dam Trunk Improvements (Project No. 4)

The Carbon Canyon Dam Trunk Improvements Project would occur under Rose Drive in the Cities of Placentia and Yorba Linda. The improvements would occur between Palm Drive to the south and Blake Road to the north. The 1896 Anaheim USGS quad sheet shows that very little development had taken place within a one-quarter mile of the proposed improvements. Only a few unimproved roads and an occasional structure existed at that time. By 1942, Rose Drive had already been built and two structures were present along the unimproved roadway. The Pacific Electric Railroad intersected Rose Drive.

No prehistoric or historic sites were recorded within a one-quarter mile radius of this project in the 12 archaeological surveys completed by SCCIC (Survey Reports OR-692, -1480, -1494, -182, -1210, -1154, -474, -1778, -301, -1291, -1777, and- 449). Similarly, no listings of historic properties on either Federal or State registers were found within a one-quarter mile radius.

Atwood Subtrunk Improvements (Project Nos. 8 and 21)

The Atwood Subtrunk Improvements Project would occur under Orangethorpe Avenue in the Cities of Anaheim and Placentia. A portion of this pipeline begins just west of Richfield Road and passes eastward to Highland Avenue; the second segment begins just west of Kellogg and concludes at Willow Woods Drive. The 1896 Anaheim USGS quad sheet shows little development in the immediate project area. Several unimproved roads were already built, and a series of structures were built on both sides of the Santa Ana River. The Atchison, Topeka, & Santa Fe Railroad (San Bernardino Branch) passed nearby. The Yorba Linda Reservoir was already built. The oil industry had already come to the area, and the Richfields community had sprung up around the oil fields along Orangethorpe Avenue.

By 1942, additional development had occurred in the area. Route 14 crossed the Santa Ana River to the south, and the community of Atwood showed a light street grid. A series of structures were present along Orangethorpe Avenue.

No prehistoric or historic sites were recorded with a one-quarter mile radius of this project in the six archaeological surveys completed by SCCIC (Survey Reports OR-112, -552, -550, -1291, -557; and ARI). Similarly, no listings of historic properties on either Federal or State registers were found within a one-quarter mile radius.

EUCLID TRUNK SEWER SYSTEM

Fullerton Purchase Improvements (Project No. 10)

The Fullerton Purchase Improvements Project would occur under Bastanchury Road (from just before Masters Drive to State College Boulevard) in the City of Fullerton. The 1896 Anaheim USGS quad sheet shows no evidence of development in the immediate vicinity of Coyote Hills, where the proposed improvements are located. There is one unimproved road (now Brea Boulevard) to the west. The City of Fullerton (founded 1904) to the west shows a light street grid.

By 1942, a number of oil fields were in operation. Bastanchury Road was one of several unimproved roads that passed along and around the hills. The City of Fullerton shows a light to medium street grid.

Five archaeological surveys were conducted within a quarter-mile radius (Survey Reports OR-1575, -1537, -1314, -985, and -474). No prehistoric or historic sites were recorded, nor are there listings of historic properties on either Federal or State registers were found within a one-quarter-mile radius of this.

Euclid Relief Improvements-A and B (Project Nos. 14 and 29)

The Euclid Relief Improvements (A and B) Project would occur under Euclid Street (from West Third Street to Mt. Langley Street) in the City of Fountain Valley. The 1896 Downey USGS quad sheet shows Coyote Creek as an intermittent stream tributary to E. Anaheim Creek. The project area was for the most part undeveloped. What is now 7th Street (Route 22) was already in existence. Marshes were present to the south in proximity to Alamitos Bay. By 1923, Routes 22 and 35 were in place along with a few unimproved roads. By 1943, Garden Grove Avenue (now Boulevard, or Route 22) was an improved road, and State Route 35 was already built.

No prehistoric or historic sites were recorded within a one-quarter mile radius of this project in the two archaeological surveys completed by SCCIC. Similarly, no listing of historic properties on either Federal or State registers were found within a one-quarter mile radius.

NEWHOPE-PLACENTIA TRUNK REPLACEMENT

Newhope-Placentia Trunk Replacement (Project No. 18-A)

The Newhope-Placentia Trunk Replacement Project would occur under State College Boulevard (from Orangewood to La Palma Road) in the Cities of Orange and Fullerton. By the turn of the century, little development had occurred within a one-quarter mile radius of the proposed improvements. The 1896 Anaheim USGS quad sheet shows Fullerton Creek, an intermittent stream, to the south, and the Santa Ana River to the north of the proposed improvements. These sources of fresh water would have likely attracted aboriginal populations. A few secondary roads were in place at that time, and two railroads, the Atchison, Topeka, & Santa Fe and the Southern Pacific (Santa Ana Branch) had already been built. To the west/southwest of the site, the City of Anaheim had been founded (1878).

By 1942, moderate development had begun along State College Boulevard (then Placentia Avenue). Oil fields were operating to the west. The City of Fullerton had been founded (1904) with a light to moderate street grid in place. The City of Placentia (founded 1926) showed a light street grid. State Route 101 Bypass (now Santa Ana Freeway) had been constructed following the Southern Pacific right-of-way.

No prehistoric or historic sites were recorded within a one-quarter mile of this project in the eight archaeological surveys completed by SCCIC (Survey Reports OR-10, -609, -814, -980, -894, -895, -1836, and -1596). Similarly, no listings of historic properties on either Federal or State registers were found within a one-quarter mile radius.

Cypress Avenue Trunk Replacement (Project No. 18-B)

The Cypress Avenue Trunk Replacement Project would occur under Yorba Linda Road and State College Boulevard in the City of Fullerton north of La Palma Avenue. The 1896 Anaheim USGS quad sheet shows a series of unimproved roads, but otherwise limited development in the vicinity of these improvements.

By 1942, oilfields were operating in the project vicinity and the Cities of Fullerton and Placentia had been founded in 1904 and 1926, respectively. The Fullerton Reservoir had also been constructed by that time. State College Boulevard (then Placentia Avenue), at that time an unimproved road, was lined by a series of structures.

No prehistoric or historic sites were recorded within a one-quarter mile radius of this project in the two archaeological surveys completed by SCCIC (Survey Reports OR-678 and -474). Similarly, no listing of historic properties on either Federal or State registers were found within a one-quarter mile radius.

KNOTT TRUNK SEWER SYSTEM

Hoover Feeder Improvements (Project No. 16)

The Hoover Feeder Trunk Improvement project would occur under Trask Avenue in the City of Westminster. The project area begins at Hoover Street and the Southern Pacific Railroad and follows Trask Avenue to the Garden Grove Freeway (Route 22).

The 1896 USGS Anaheim quad sheet reveals a light to moderate street grid surrounding the project area with only a scattering of structures in the immediate vicinity. The community of Garden Grove was already well developed to the east of the project area. The area overall was called Los Alamitos. Garden Grove Boulevard, Dale Avenue, and Stanton Avenue were already constructed. The main Santa Ana River channel ran roughly five miles due east of the project area, while a branch of the river lay to the north.

The 1942 USGS Anaheim quad sheet shows the Southern Pacific Railroad already built. The Pacific Electric Line passes from southeast to northwest of the property. The community of Westminster shows a moderate street grid to the south of the project area. The community of Garden Grove to the east shows a heavy street grid. Stanton Avenue (Route 39) and Garden Grove Boulevard (Route 22) are primary roads. In the immediate project vicinity there are two structures at the eastern terminus of what is now Trask Avenue.

No archaeological surveys have been conducted within the project radius. No prehistoric or historic sites have been recorded within a ¼ mile radius of the project area. There are no listings of historic properties on the National Register of Historic Places, the California State Historic Resources Inventory, California Historical Landmarks, or California Points of Historical Interest (Dinishak 1999).

West Side Relief Interceptor Improvements (Project No. 23)

The West Side Relief Interceptor Improvements Project would occur under Seal Beach Boulevard in the City of Seal Beach, which then turns into Los Alamitos Boulevard. This portion of Los Alamitos Boulevard is bordered by the unincorporated community of Rossmore and the City of Alamitos. The 1896 Downey USGS quad sheet shows Coyote Creek, an intermittent stream, tributary to E. Anaheim Creek. The project area at that time was for the most part undeveloped.

Seventh Street/Route 22 was already built. Marshes were present to the south in proximity to Alamitos Bay. By 1923, Routes 22 and 35 were improved roads. There were a few unimproved roads in the immediate area. By 1943, Garden Grove Avenue (Boulevard, or Route 22) was a primary road. A light street grid was present north of the project area. The Southern Pacific Railroad passed to the north of the project area.

Of the two archaeological surveys conducted by SCCIC within a one-quarter mile radius of the project (Survey Reports OR-480 and –1676), only one prehistoric archaeological site (Site CA-ORA-1352) has been recorded. CA-ORA-1352 is recorded as a disturbed shell midden (Van Horn, 1979).

No listings of historic properties on either Federal or State registers were found within a one-quarter mile radius of this project.

Warner Avenue Relief Sewer (Project Nos. 17 and 28)

The Warner Avenue Relief Sewer Project would occur under Los Patos Avenue (from Bolsa Chica Street to Marina View Place) and Warner Avenue (from Springdale Street to just east of Graham Street) in the City of Huntington Beach. The 1894 Las Bolsas USGS quad sheet shows the project area as marshland surrounding Bolsa Bay, with Bolsa Creek at its mouth. There were a few unimproved roads with an occasional structure. By 1941, there was a light street grid in the project vicinity. Wintersburg Avenue (Warner Avenue), Slater Avenue, and Bolsa Chica Street had been built. Los Patos was named Chica at that time.

Of the 23 archaeological surveys conducted by SCCIC within a one-quarter mile radius of the project (Survey Reports OR-1444, -1442, -1384, -923, -1186, -910, -1433, -1865, -1860, -1582, -1534, -1867, -1859, -1861, -15533, -1455, -1002, -1868, -1547, -1548, -1901, -1547, and, -1548), eight prehistoric archaeological sites have been recorded. These include CA-ORA-83, CA-ORA-84, CA-ORA-85, CA-ORA-86, CA-ORA-87, -CA-ORA- 144, CA-ORA-288, and CA-ORA-289.

CA-ORA-83, CA-ORA-86, and CA-ORA-144 are contiguous sites that form an extensive shell midden with one unifacial tool observed in the most recent site recording (Weber, 1991). CA-ORA-84 and CA-ORA-289 are also contiguous and include a shell scatter with ground stone tools, debitage, hammerstones, arrowpoints, flaked stone tools, and probable midden deposits (Gross, 1986; Van Bueren and Sorensen, 1988a). CA-ORA-85 is a large shell midden with ground stone tools, flaked stone tools, dart points, debitage, hammerstones, human bone, animal bone, possibly daub, and World War II-era historic features, including a concrete water tank, concrete bunker/ammunition magazine, various concrete foundations, and iron pipelines (Van Bueren and Sorensen, 1988b). CA-ORA-87 is an extensive shell midden with manos, beads, debitage, chopper, scraper, utilized flakes, drill, and a human burial (Kice, 1993). CA-ORA-288 is recorded as a shell midden with ground stone tools, hammerstones, a core, a graver, and flakes (Cooley, 1973).

No listings of historic properties on either Federal or State registers were found within a one-quarter mile radius of this project.

Edinger/Bolsa Chica Trunk Improvements (Project No. 30)

The Edinger/Bolsa Chica Trunk Improvements Project would be located under Edinger Street in the City of Huntington Beach. The project would include work on two segments of Edinger Street. One segment passes from Springdale Street westward to Wheeler Park, while the other begins at Liles Lane and ends at Bolsa Chica Street. The 1894 Las Bolsas USGS quad sheet shows open space in the project area. The land is marshy with only a few unimproved roads. By 1941, the map shows a light street grid and several unimproved roads with an occasional structure.

No prehistoric or historic sites were recorded within a one-quarter mile radius of this project in the archaeological survey completed by SCCIC (Survey Report OR-1755). Similarly, no listing of historic properties on either Federal or State registers were found within a one-quarter mile radius.

BAKER-MAIN TRUNK SEWER SYSTEM

Campus Drive Subtrunk Improvements (Project Nos. 24 and 31)

The Campus Drive Subtrunk Improvements Project would occur under Campus Drive (from Dove Street to Von Karman Avnenue) in the Cities of Irvine and Newport Beach. The 1894 Santa Ana USGS quad sheet shows little development in the area. There were only a few unimproved roads. The Santa Ana and Newport Railroad passed through the area. Peters Canyon, an intermittent stream, flowed nearby. Much of the land in the vicinity of the project area was marshy. The1901 USGS quad sheet (reprinted 1945) shows that a few more unimproved roads were in existence; otherwise, little had changed.

No prehistoric of historic sites were recorded within a one-quarter mile radius of this project in the seven archaeological surveys completed by SCCIC and others (Survey Reports OR-246, -856, -1016, -939, -1591; Collins Radio Survey by ARI; UCLA and ERA survey). Similarly, no listings of historic properties on either Federal or State registers were found within a one-quarter mile radius.

Fairview Relief Sewer (Project No. 3)

The Fairview Relief Sewer Project would occur under Fairview Road (from Baker Street to Virginia Place) in the City of Costa Mesa. The 1894 Santa Ana quad sheet shows that the project area is undeveloped. Newport Back Bay is evident, the Santa Ana River channel can be seen, and marshes are present to the northeast. The1901 USGS quad sheet (reprinted 1945) shows that several unimproved roads and occasional structures were in place. Low elevation areas continued to be dominated by marshes.

No prehistoric or historic sites were recorded within a one-quarter mile radius of this project in the four archaeological surveys completed by SCCIC. Similarly, no listing of historic properties on either Federal or State registers were found within a one-quarter mile radius.

GISLER-REDHILL TRUNK SEWER SYTEM

Gisler-Redhill/North Trunk Improvements (Project No. 6)

The Gisler-Redhill/North Trunk Improvements project would occur under Prospect Avenue, Main Street and El Camino Real in the City of Tustin. The 1896 Anaheim USGS quad sheet shows little development in the project area. The Atchison, Topeka, & Santa Fe Railroad (Tustin Branch) passed to the west of the project area through the community of McPherson and on to El Modena Station. Several improved roads were in place with a few structures along them. Both the City of Santa Ana (founded 1886) and the City of Orange (founded 1888) showed moderate street grids. By 1942, State Route 101 (later Santa Ana Freeway), Seventeenth Street, Newport Avenue, Route 55 (Newport Freeway), and Chapman Avenue existed as improved roads.

Four archaeological surveys have been conducted within a one-quarter-mile radius of the project area. No listings of historic properties on either Federal or State registers were found within a one-quarter mile radius of this project.

Gisler-Redhill System Improvements-A and B (Project Nos. 9, 13, 22, and 32)

The Gisler-Redhill System Improvements – A and B Project would occur under Redhill Avenue in the Cities of Tustin and Santa Ana. Segment A follows Redhill Avenue from Mitchell Avenue to Irvine Boulevard, and another piece of segment A passes along Skyline Drive from Redhill Avenue to Newport Avenue and up Arroyo Drive to Mardick Drive. Segment B follows Redhill Avenue from Deere Avenue to Mitchell Avenue. The 1894 Santa Ana USGS quad sheet shows light to moderate development in the Tustin area. The Atchison, Topeka, & Santa Fe Railroad (Los Angeles and San Diego Branch) passed through the area. The Santa Ana and Newport Railroad served the community of Tustin on its way to Newport Beach. There were a few unimproved roads with occasional structures alongside them.

The1901 USGS quad sheet (reprinted 1945) shows that the Atchison, Topeka, & Santa Fe Railroad was now the Southern California Surf Line. Southern Pacific (Newport Beach Branch) replaced the Santa Ana and Newport Railroad. Newport Avenue followed the old route of the Southern Pacific Railroad where it turned westward toward Newport Beach. Outside the moderate street grid in the City of Tustin (founded 1927) were some additional unimproved roads and streets.

Of the seven archaeological surveys conducted by SCCIC within a one-quarter mile radius of the project (Survey Reports OR-609, -996, -72, -1357, -1099, -814, and -1902), four prehistoric archaeological sites have been recorded. These include CA-ORA-300, CA-ORA-352, CA-ORA-353, and CA-ORA-381. CA-ORA-300 is a shell midden with an arrowpoint, core, an obsidian flake, steatite bowl, incised stone, pestles, and five burials reported with one additional burial on adjacent land (Sperry, 1971a). CA-ORA-352 is recorded as a stone bowl and two pestles (Sperry, 1972a). CA-ORA-353 consists of a large stone bowl (missing), granitic pestle, scraper, and fragmentary pestles (Sperry, 1972b). CA-ORA-381 consists of artifacts turned over to the Bowers Museum by a farmer (Sperry, 1972c).

No listings of historic properties on either Federal or State registers were found within a one-quarter mile radius of this project.

Tustin Trunk Improvements (Project Nos. 11, 12, and 19)

The Tustin Trunk Improvements Project would occur under Cowan Heights, Newport Avenue and Irvine Boulevard in the City of Tustin and in unincorporated areas of the County of Orange. The Anaheim 1896 USGS quad sheet shows only light development in this area. The communities of El Modena and Modena Station, a stop on the Atchison, Topeka & Santa Fe Railroad (Tustin Branch), had already been established and a few improved roads had been constructed. By 1942, the communities of Panorama Heights, La Paloma, and Hewes Park had been established. Both Chapman Avenue and Newport Avenue were already present.

No prehistoric or historic sites were recorded within a one-quarter mile radius of this project in the nine archaeological surveys completed by SCCIC (Survey Reports OR-992, -48, -1051, -826, -828, -71, -106, -103, and -212). Similarly, no listings of historic properties on either Federal or State registers were found within a one-quarter mile radius.

Orange Trunk Improvements (Project No. 5)

The Orange Trunk Improvements Project would occur under Hewes Avenue, Vanderlip Avenue and Holt Avenue in the County of Orange. The Anaheim 1896 USGS quad sheet shows little development in this area. The communities of El Modena and Modena Station, a stop on the Atchison, Topeka & Santa Fe Railroad (Tustin Branch), were already established. A few improved roads had been constructed. By 1942, the communities of Panorama Heights, McPherson, La Paloma, and Hewes Park had been established to the east of the project area. Both Chapman Avenue and Newport Avenue were already built.

No prehistoric or historic sites were recorded within a one-quarter mile radius of this project in the two archaeological surveys completed by SCCIC (Survey Reports OR-826 and -828). Similarly, no listings of historic properties on either Federal or State registers were found within a one-quarter mile radius.

Orange Park Acres Trunk Replacement (Project No.7)

The Orange Park Acres Trunk Replacement Project would occur under Santiago Canyon Road (from Jamestown Way to Randall Street) in the City of Santa Ana. The 1896 Anaheim USGS quad sheet shows that little development had occurred in this area. Santiago Creek and Handy Creek, fresh water sources, were present and may have attracted prehistoric populations to the area. Light street grids were present in the communities of McPherson, Villa Park, and El Modena. The Atchison, Topeka, & Santa Fe Railroad (Tustin Branch) was already built, and there were a few improved roads in the project vicinity. By 1942, increased development in the communities of El Modena and Villa Park had occurred.

No prehistoric of historic sites were recorded within a one-quarter mile radius of this project in the six archaeological surveys completed by SCCIC (Survey Reports OR-162, -163, -323, -214, -

35, and -1635). Similarly, no listings of historic properties on either Federal or State registers were found within a one-quarter mile radius.

West Trunk Improvements (Project No. 26)

The West Trunk Improvements Project would occur east of Prentica Park (east of 1st Street and to the north of Main Street) in the City of Santa Ana. The 1894 Santa Ana USGS quad sheet shows that the immediate project area was undeveloped. There was light to moderate development in the community of Tustin and in the City of Santa Ana (founded 1886). Two railroads served the area: Atchison, Topeka, & Santa Fe (Los Angeles and San Diego Branch), and the Santa Ana and Newport Railroad. Outside the street grids of Tustin and Santa Ana, there were several unimproved roads and occasional structures. The1901 USGS quad sheet (reprinted 1945) shows more development with additional roads and structures, and Tustin had become a city by 1927. The Southern Pacific Railroad (Newport Beach Branch) had replaced the Santa Ana and Newport Railroad. Newport Avenue followed the old Southern Pacific rail line where it turned westward toward Newport Beach.

No prehistoric or historic sites were recorded within a one-quarter mile radius of this project in the three archaeological surveys completed by SCCIC (Survey Reports OR-879, -814, and -1902). Similarly, no listings of historic properties on either Federal or State registers were found within a one-quarter mile radius.

Armstrong Subtrunk (Project Nos.7 - 27)

The Armstrong Subtrunk project would occur under Armstrong and Gillete in the City of Irvine. The project area begins on Armstrong at Barranca in the City of Tustin and proceeds to Alton Parkway and then southward on Alton Parkway in the City of Irvine.

The 1894 Santa Ana USGS topographic map reveals that the Santa Ana and Newport Railroad passed through the project area on its way to Newport Beach. A few structures lay adjacent to the rail line. The Atchison, Topeka & Santa Fe Railroad (Los Angeles and San Diego Branch) passed to the northeast of the project area. Freshwater marshes are present in the immediate project vicinity, while Peters Canyon Wash flowed across what is now the Tustin Plain to the east and northeast. The City of Santa Ana (founded 1886) shows heavy urban development at this time. The community of Newport to the west shows a light street grid. The community of Fairview to the southwest shows a moderate street grid. The community of Tustin to the northeast shows a moderate street grid.

The 1901 (reprinted 1945) USGS quad map shows that the Santa Ana and Newport Railroad had become the Southern Pacific Railroad (Newport Beach Branch). Freshwater marshes were still present in the immediate project area and Peters Canyon Wash drained the Tustin Plain as before. The City of Santa Ana shows heavy urban development. The community of Tustin became a city in 1927. Fairview continues to show a moderate street grid, while Newport has a light street grid. Orange County was already founded (1899).

Three archaeological surveys or excavations (OR-1099, OR-246, OR-134) have been carried out within a ¼ mile radius of the project area. No prehistoric or historic sites have been recorded within the project radius. There are no listings of historic properties on the National Register of Historic Places, the California State Historic Resources Inventory, California Historical Landmarks, or California Points of Historical Interest (Dinishak 1999).

INTERPLANT/JOINT WORKS

Bushard Trunk Improvement (Project No. 1)

The Bushard Trunk Improvement Project would occur under Bushard Street (from Ellis Avenue to Brookurst Street) in the Cities of Fountain Valley and Huntington Beach. The 1894 Santa Ana USGS quad sheet shows little development in the immediate project area. There were a few unimproved roads with an occasional structure. Both Bolsa Avenue and Talbert Street were already built. The Santa Ana River to the east and north of the project area would have attracted prehistoric populations. The1901 USGS quad sheet (reprinted 1945) shows that there was still only minor development in the project area. There were only a few unimproved roads. Much of the land was marshy and largely unused.

No prehistoric or historic sites were recorded within a one-quarter mile radius of this project in the four archaeological surveys completed by SCCIC (Survey Reports OR-1, 1087, -1765, and -1836). Similarly, no listing of historic properties on either Federal or State Registers were found within a one-quarter mile radius.

REGULATORY ENVIRONMENT

Federal

Numerous federal laws and regulations have been developed to protect cultural resources. The cornerstone of which is the National Historic Preservation Act of 1966 (as amended). The Act established the Advisory Council on Historic Preservation and the National Register of Historic Places. Section 106 of the Act requires that projects located on federal land, constructed with federal funds, or that require federal permits, must endeavor to locate all cultural resources within the proposed project's Area of Potential Effect. Cultural resources must then be evaluated for their eligibility for inclusion on the National Register. Sites judged significant must be avoided or subject to programs that mitigate adverse effects.

State

At the State level, the California Environmental Quality Act (CEQA) establishes two separate mechanisms for evaluating potential adverse effects on archaeological resources. These include the California Register of Historical Resources (CRHR; Section 21084.1) and "unique" archaeological resources (Section 21083.2). CEQA emphasizes avoidance of cultural resources as the preferred means of preservation. If avoidance of a significant cultural resource is impossible, an excavation program, or some other form of mitigation, must be developed to

mitigate adverse impacts. If a cultural resource is not significant, it need not be considered further in the planning process.

California Register of Historic Resources

As of January 1998, the California Register of Historical Resources is the authoritative guide and listing of properties to be protected from substantial adverse change. This list includes properties listed or formally determined eligible for the National Register of Historical Places (NRHP), State Historical Landmarks, and eligible Points of Historical Interest. In order for a resource to be eligible for listing on the California Register, it must satisfy each of the following three criteria: (1) a property must be significant at the local, state, or national level; (2) the resource retains historic integrity; and (3) it is 50 years old or older (with some exceptions).

Native American Resources in California

Various sections of the State of California Health and Safety Code and the Public Resources Code apply to Native American sacred places on public lands and the discovery of skeletal remains on state and private land. Section 7050.5 of the Health and Safety Code requires the coroner to contact the Native American Heritage Commission within 24 hours by telephone if it is recognized that the human remains are prehistoric. Section 5097.9 (and following) of the Public Resources Code prohibits interference with the free expression or exercise of Native American religion; establishes a Native American Heritage Commission; requires the Commission to prepare an inventory of sacred places located on public land; and grants the Commission power to conduct investigations and recommend mitigation for agency actions that may cause damage to Native American sacred places on public property. Section 5097.99 also makes is a felony to obtain or possess Native American remains or associated grave goods.

Local

The Cultural and Historic Resources Component of the County's General Plan stresses the importance of cultural resources management in the County (County of Orange Environmental Agency, 1984). Applicable goals, objectives and policies of the General Plan, with regards to cultural resources management, are identified below.

Goal 2: To encourage through a resource management effort the preservation of the County's cultural and historic heritage.

Objectives:

a. Promote the preservation and use of buildings, sites, structures, objects and districts of importance in Orange County through the administration of planning, environmental, and resource management programs.
b. Take all reasonable and proper steps to achieve the preservation and analysis to preserve cultural, scientific and educational values.
c. Take all reasonable and proper steps to achieve the preservation and use of significant historic resources including properties of historic, historic architectural, historic archaeological, and/or historic preservation value.
d. Provide assistance to County agencies in evaluating the cultural environmental impact of proposed projects and reviewing Environmental Impact Reports (EIRs).
e. Provide incentives to encourage greater private sector participation in historic preservation.

Policies:

a. Identification of resources shall be completed at the earliest stage of project planning and review.
b. Evaluation of resources shall be completed at intermediate stages of project planning and review, such as site plan review, subdivision map approval, or earlier in the planning process.
c. Final preservation actions shall be completed at final stages of project planning and review (prior to grading, demolition, or at an earlier stage of project review).

1. Archaeological Resources:

    a. To identify archaeological resources through literature and records search and surface surveys.
    b. To evaluate archaeological resources through subsurface testing to determine significance and extent.
    c. To observe and collect archaeological resources during the grading of a project.
    d. To preserve archaeological resources by:
    – Maintaining them in an undisturbed condition, or
    – Excavating and salvaging materials and information in a scientific manner.

2. Paleontological Resources:

    a. To identify Paleontological resources through literature and records search and surface surveys.
    b. To monitor and salvage Paleontological resources during the grading of a project.
    c. To preserve Paleontological resources by maintaining them in an undisturbed condition.

3. Historic Resources:

    a. To identify historic resources through literature and records research and/or on-site surveys.
    b. To evaluate historic resources through comparative combination analysis or through subsurface or materials testing.
    e. To preserve significant historic resources by one or a combination of the following alternatives, as agreed upon by the County and the Project Sponsor:

– Adaptive reuse of historic resources.
– Maintaining the historic resource in an undisturbed condition.
– Moving the historic resource and arranging for its treatment.
– Salvage and conservation of significant elements of the historic resources.
– Formal documentation of the historic resource prior to destruction..

In order to achieve its cultural resources goals, the County has identified the following programs:

- Advisory Bodies Program
- Archeo/Paleo Certification Programs
- Archive Program
- County Historical Parks and Facilities Program
- Countywide Historic Survey Program
- Cultural/Scientific and Historic Resource Management Program
- Information Clearinghouse Program
- Local Historical Organizations Liaison Program
- Museum Function Assistance Program
- Plaque Program
- Preservation Incentives Program
- Publications Program
- Public Participation Program
- Special Activities Program

7.10.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERA

In accordance with Section 15064.5(b) of the CEQA Guidelines, a significant effect will normally occur if a project will cause a substantial adverse change (destruction, relocation, etc.) in the significance of a historical resource. Historic resources include:

1. A resource listed in the California Register of Historical Resources, or determined to be eligible by the State Historical Resources Commission.

2. A resource included in a local register of historic resources.

3. Any object, building, structure, site, area, or manuscript that a lead agency determines to be "historically significant" or significant in the annals of California may be considered a historic resource, provided the lead agency's determination is supported by substantial evidence. Generally, a resource shall be considered to be historically significant if the resource meets the criteria for listing in the California Register of Historic Resources.

When a project will adversely affect an archaeological site, a lead agency shall first determine whether the site is a historical resource, as defined above. If it is determined that the archaeological site is a historical resource, the provisions of Public Resources Code Section 21084.1 (Effects on Historical Resources) apply. If an archaeological site does not meet the criteria, but does meet the definition of a "unique archaeological resource" in Public Resources Code Section 21083.2 (Significant Effect on Archaeological Resources), the site must be treated in accordance with the provisions of Section 21083.2. Section 21083.2 defines a unique

archaeological resource as "an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body knowledge, there is a high probability that it meets any of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.

2. It has a special and particular quality such as being the oldest of its type or the best available example of its type.

3. Is directly associated with a scientifically recognized important prehistoric or historic event."

To evaluate archaeological resource sites against such broad criteria requires consideration of the overall integrity of the site, the regional cultural history (the types, ages, and distribution of other cultural resources in the region), and the nature of questions that researchers are attempting to address regarding the history or prehistory of the region. An archaeological site evaluation assesses the potential of each site to meet one or more of the criteria for "unique archaeological resource" based upon visual surface and subsurface evidence at each site location, information gathered during the literature and record searches, and the researcher's knowledge of and familiarity with the prehistoric context associated with each site.

For purposes of this EIR, a significant effect would occur if the integrity of a cultural resource that is considered a "historic resource," as defined above, would be compromised through physical demolition, destruction, relocations, or alteration.

CONSTRUCTION

Impact 7.10-1: Implementation of the proposed collection system improvements may affect known, significant archaeological resources. Less than Significant with Mitigation Measures.

As shown in **Table 7.10-1**, there are 15 recorded prehistoric archaeological resources within a one-quarter mile radius of the proposed collection system improvements. Three of these sites (CA-ORA-85, CA-ORA-87, and CA-ORO-300) have been identified as having buried remains. **Table 7.10-1** also shows the approximate distance between the known resources and proposed construction activities. Six of the 15 sites are located on the alignments where improvements would occur. Subsurface construction in these areas could unearth significant prehistoric site deposits. The following mitigation measure would apply to the 15 collection system improvement projects that have known archaeological resources within a one-quarter mile radius of them, as indicated in **Table 7.10-1**.

EIR-Identified Mitigation

Measure 7.10-1: During project design, within the area of the 6 recorded archaeological sites within proposed project alignments, a qualified archaeologist should conduct a subsurface testing program to determine whether intact significant deposits exist in the excavation area. Should testing indicate that areas of significant deposits do exist, the

deposits would be preserved in place, if feasible. If preservation in place is not feasible, a Data Recovery Plan would be prepared to address the removal of those deposits and would be implemented before the beginning of construction. The Plan would define how and when mechanical and manual excavation would be conducted, the anticipated volume of recovered soils, artifact analysis, cataloging and curation, and monitoring and reporting requirements. For the three sites where human remains have been recorded (CA-ORA-85, CA-ORA-87, and CA-ORO-300), the District would enter into a written agreement between an archaeological consultant, to be retained by the District, and a Native American representative prior to construction in the vicinity of these sites. This agreement would specify terms as to the treatment and disposition of the human remains, and should define "associated burial goods" with reference to Public Resources Code Sections 5097.94, 5097.98, and 5097.99 and Health and Safety Code Section 7050.5.

Significance after Mitigation: Less than Significant.

Impact 7.10-2: Implementation of the proposed collection system improvements may affect unknown, potentially significant archeological resources. Less than Significant with Mitigation Measures.

Although a thorough record and literature search of the proposed alignments was conducted by qualified archaeologists, there remains a possibility that previously unknown significant deposits may be encountered during construction of the proposed collection system improvements. The majority of the proposed collection system improvements would occur in areas that have creeks, rivers (freshwater sources), or embayments (shellfish and fish sources) that may have attracted prehistoric populations. The project areas also occur in a region that saw very early development, including the Portolà Expedition, Spanish missions, various land grants, City and Orange County developments, oil industry development, and railroad and highway development. Remnants of these prehistoric and historic developments are recorded along nearly all segments of the wastewater pipeline where construction would occur.

Based on the presence of recorded archaeological resources and historical development that would suggest the presence of early inhabitants, some of the collection system improvement projects are considered more likely to encounter archaeological resources than others. **Table 7.10-2** shows the probability of encountering previously unknown archaeological resources for each of the proposed collection system improvement projects. Disturbance of previously unknown archaeological resources is a potentially significant impact.

EIR-Identified Mitigation

Measure 7.10-2a: Subsurface construction has a low to very high potential for exposing significant subsurface cultural resources. Due to the likelihood of encountering cultural resources, the District should implement the following prior to project construction:

TABLE 7.10-2
PROBABLILITY OF IMPACTING UNKNOWN PREHISTORIC ARCHAEOLOGICAL RESOURCES DURING CONSTRUCTION OF THE PROPOSED COLLECTION SYSTEM IMPROVEMENTS

Proposed Project	Probability of Impacts
Santa Ana River Trunk Sewer System	
Santa Ana River Interceptor Improvements	Very High
Taft Branch Improvements	Moderate
Carbon Canyon Dam Trunk Improvements	Moderate
Atwood Subtrunk Improvements	Moderate
Euclid Trunk Sewer System	
Fullerton Purchase Improvements	Moderate
Euclid Relief Improvements – A and B	Low
Newhope-Placentia Trunk Replacement	
Newhope-Placentia Trunk Replacement	Moderate
Cypress Avenue Trunk Replacement	Moderate
Knott Trunk Sewer System	
Hoover Trunk Sewer System	Moderate
West Side Relief Interceptor Improvements	High
Warner Avenue Relief Sewer	Very High
Edinger/Bolsa Chica Trunk Improvements	Low
Baker-Main Trunk Sewer System	
Campus Drive Subtrunk Improvements	Low
Fairview Relief Sewer	Low
Bushard Trunk Sewer System	
Bushard Trunk Improvements	Low
Gisler-Redhill Trunk Sewer System	
Gisler-Redhill/North Trunk Improvements	Moderate
Gisler-Redhill System Improvements – A and B	Very High
Tustin Trunk Improvements	Moderate
Orange Trunk Improvements	Moderate
Orange Park Acres Trunk Replacement	Moderate
West Trunk Improvements	Moderate
Armstrong Subtrunk	Moderate

- Language should be included in the General Specifications section of any subsurface construction contracts alerting the contractor to the potential for subsurface cultural resources and trespassing on known or potential resources adjacent to the project.

- Prior to construction, contractors and District staff will receive an archaeological orientation from a professional archaeologist regarding the types of resources which may be uncovered and how to identify these resources during construction activities. The orientation shall also cover procedures to follow in the case of any archaeological discovery.

Measure 7.10-2b: If cultural resources are encountered at any time during project excavation, construction personnel would avoid altering these materials and their context until a qualified archaeologist has evaluated the situation. Project personnel would not collect or retain cultural resources. Prehistoric resources include, but are not limited to, chert or obsidian flakes, projectile points, mortars, and pestles; and dark, friable soil containing shell and bone, dietary debris, heat-affected rock, or human burials. Historic resources include stone or adobe foundations or walls; structures and remains with square nails; and refuse deposits (glass, metal, wood, ceramics), often found in old wells and privies.

Measure 7.10-2c: In the event of accidental discovery or recognition of any human remains, the County Coroner would be notified immediately and construction activities shall be halted. If the remains are found to be Native American, the Native American Heritage Commission would be notified within 24 hours. Guidelines of the Native American Heritage Commission shall be adhered to in the treatment and disposition of the remains.

Significance after Mitigation: Less than Significant.

REFERENCES – CULTURAL RESOURCES

Cooley, T. G. 1973. Report of Test Excavations: CA-ORA-83, CA-ORA-85, CA-ORA-288. Report submitted to Signal Properties, Inc. Copy on file, ARMC.

County of Orange Environmental Agency, *Component II Advanced Planning Program Resources Element*, April 18, 1984.

Gross, L. 1986. Supplement to site survey record for CA-ORA-84. On file, SCCIC.

Kice, D. A. 1993. Supplement to site survey record for CA-ORA-87. On file, SCCIC.

McKinney, A. 1970. Site survey record for CA-ORA-277. On file, SCCIC.

Sperry, P.
1971a Site survey record for CA-ORA-300. On file, SCCIC.
1971b Site survey record for CA-ORA-301. On file, SCCIC.
1972a Site survey record for CA-ORA-352. On file, SCCIC.
1972b Site survey record for CA-ORA-353. On file, SCCIC.
1972c Site survey record for CA-ORA-381. On file, SCCIC.

Van Bueren, T., and J. Sorensen.
1988a Supplement to site survey record for CA-ORA-84/289. On file, SCCIC.
1988b Supplement to site survey record for CA-ORA-85. On file, SCCIC.

Van Horn, D. Site survey record for CA-ORA-1352. On file, SCCIC.

Weber, C. 1991. Supplement to site survey record for CA-ORA-83/86/144. On file, SCCIC.

7.11 CUMULATIVE IMPACTS

7.11.1 LEGAL REQUIREMENTS

State California Environmental Quality Act (CEQA) Guidelines require that the cumulative impacts of a proposed project be addressed in the EIR when cumulative impacts are expected to be significant. Cumulative impacts are impacts on the environment that result from the incremental impacts of a proposed action when added to other past, present, and reasonably foreseeable future actions. Such impacts can result from individually minor but collectively significant actions taking place over a period of time.

Section 15130 of the CEQA Guidelines states that the discussion of cumulative impacts need not provide as much detail as the discussion of effects attributable to the project alone. The level of detail should be guided by what is practical and reasonable.

7.11.2 APPROACH TO ANALYSIS

According to CEQA Guidelines Sections 15130(a) and (b), the purpose of this section is to provide a discussion of significant cumulative impacts resulting from the collection systems improvements in combination with other projects or conditions, and to indicate the severity of the impacts and their likelihood of occurrence. The CEQA Guidelines require that EIRs discuss the cumulative impacts of a project when the project's incremental effect is "cumulatively considerable," meaning that the project's incremental effects are considerable when viewed in connection with effects of past, current, and probable future projects. The discussion of cumulative impacts should include:

(1) Either: (A), a list of past, present, and probable future projects producing related or cumulative impacts; or (B), a summary of projections contained in an adopted general plan or similar document, or in a adopted or certified environmental document, which describes or evaluated conditions contributing to a cumulative impact;

(2) A discussion of the geographic scope of the area affected by the cumulative effect;

(3) A summary of expected environmental effects to be produced by these projects; and,

(4) Reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects.

This analysis relies on a list of projects that are current and reasonably foreseeable and that could have cumulative effects in combination with the OCSD collection system projects.

7.11.3 POTENTIAL PLANS AND PROJECTS WITH RELATED OR CUMULATIVE EFFECT

As discussed in this Chapter, the majority of direct impacts associated with the collection system project relate to facility construction and improvements. All construction impacts could be mitigated to less-than-significant levels. The impacts associated with operation of the facilities are considered less-than-significant for all impacts. Therefore, the analysis of cumulative effects in this chapter focuses primarily on potentially concurrent construction projects, not on the operation of other nearby facilities under normal conditions. The cumulative indirect or secondary significant effects of the Strategic Program associated with growth induced by increased wastewater conveyance capacity are addressed in Chapter 11, Growth Inducement / Secondary Effects of Growth.

The Orange County Publics Works and Utility Coordinating Committee routinely compiles a list of construction projects occurring in Orange County (see **Appendix D** for the current list). The list includes road improvements and reconstruction, utility improvements, installation and relocation, and structural construction projects. The October 1998 list shows projects spanning to the year 2000, but future projects are added every six months. There are 47 participating agencies and city public works departments represented on the committee. Those entities relevant to this project are: Caltrans, Orange County Flood Control, Orange County Public Works, Orange County Water District, Yorba Linda Water District, Southern California Edison Company, The Gas Company, GTE California Inc., Pacific Bell and the cities of Costa Mesa, Huntington Beach, Fountain Valley, Westminster, Seal Beach, Irvine, Tustin, Orange, Anaheim, Fullerton, La Habra, Placentia, Yorba Linda, Santa Ana, Los Alamitos, Newport Beach, Garden Grove, Stanton, Cypress, Buena Park, Brea, Villa Park, and La Palma. This cumulative analysis incorporates the Orange County projects list.

On April 2, 1999 the District sent letters to public works departments of each city within its Services Area. The letters served to notify cities and interested agencies of the District's plans for sewer upgrades in the next twenty years and to request capital improvement lists in order to better coordinate construction activities. As of the date of this report, eleven responses were received by the District. **Appendix D** contains copies of these response letters. The following cities responded: Placentia, Newport Beach, Orange, La Habra, Tustin, Irvine, Fullerton, and Costa Mesa. The County of Orange, CalTrans, and the Orange County Transportation Authority (OTCA) also responded. **Table 7.11-1** lists responding cities and potential conflicts.

TABLE 7.11-1
POTENTIAL CONFLICTS WITH IMPROVEMENTS PLANNED IN SERVICE AREA

City or Agency	Potential Conflict
Placentia	City proposing capital improvements within portions of Carbon Canyon Trunk and Atwood Subtrunk (OCSD Projects 4, 8, and 21)
Newport Beach	City proposing capital improvements for the area near Campus Drive (OCSD Projects 31 and 24)
Orange	City proposing capital improvements for the area near Taft Branch Improvements (OCSD Project 2)
La Habra	No conflicts reported
Tustin	City proposing capital improvements for the area near Gisler Redhill System Improvements - B and the Tustin Trunk Improvements (OCSD Projects 5, 6, 11, 22 and 13)
Irvine	City proposing capital improvements for the area near Campus Drive (OCSD Projects 31 and 24) and Armstrong (OCSD Project/Contract number 7-27)
Fullerton	City proposing capital improvements for the area near Fullerton Purchase Improvement (OCSD Project 10)
Costa Mesa	No conflicts reported
CalTrans	No list provided, conflicts assumed.
County of Orange	County is proposing capital improvements for the area near Campus Drive (OCSD Projects 31 and 24)
Orange County Transportation Authority	OCTA is proposing project throughout the Service Area which could conflict with OCSD projects. Each OCSD project could potentially conflict with the OCTA capital improvement project list.

7.11.4 IMPACTS AND MITIGATION MEASURES

Impact 7.11-1: Construction activities of the collection system projects in conjunction with other projects would result in short-term cumulative impacts. Less than Significant with Mitigation Measures.

Concurrent construction of several infrastructure and development projects within the project area would result in cumulative short-term impacts associated with construction activities. These include short-term impacts to surface water quality, noise air quality, land use, access and traffic. These cumulative effects result from the physical overlap of the project areas and could be locally intensified if the projects are constructed concurrently. However, construction-related impacts would not result in long-term alteration of the environment, and could be avoided or mitigated to less than significant levels if the District and the sponsors of other projects coordinate construction activities through use of standard construction measures. Therefore, potential cumulative impacts of project construction are considered less-than-significant.

Coordination of infrastructure projects so that construction areas and schedules could be consolidated would substantially reduce the frequency and duration of construction impacts. The District has no authority to require coordination of construction by other utilities but would work cooperatively with local agencies to minimize cumulative construction effects where possible. The District conducts an outreach and coordination program within its Service Area to promote communications between public works agencies. The District provides cost-sharing incentives to cities willing to coordinate construction projects within city streets.

District-Proposed Mitigation

> **Measure 7.11-1a:** The District will continue to coordinate construction activities with the county and city public works and planning departments and other local agencies to identify overlapping pipeline routes, project areas, and construction schedules. To the extent feasible, construction activities should be coordinated to consolidate the occurrence of short-term construction-related impacts.

Significance after Mitigation: Less than Significant.

REFERENCES – CUMULATIVE IMPACTS

Orange County Public Facilities & Resources Department, Utilities Section, *Public Works and Utility Coordinating Committee*, October 1998.

CHAPTER 8

RESIDUAL SOLIDS AND BIOSOLIDS MANAGEMENT SETTING, IMPACTS, AND MITIGATION

CHAPTER 8.0

RESIDUAL SOLIDS/BIOSOLIDS MANAGEMENT SETTING, IMPACTS, AND MITIGATIONS

8.1 INTRODUCTION

As described in Section 3.11 of the Project Description, Orange County Sanitation District's (OCSD) proposed Strategic Plan recommends that no immediate changes be made in the method of biosolids management, processing, and reuse at Reclamation Plant No. 1 and Treatment Plant No. 2. A number of uncertainties related to the viability of biosolids land application in the future have caused the District to evaluate other biosolids management and processing options for future implementation. Currently, Class B biosolids produced from Reclamation Plant No. 1 and Treatment Plant No. 2 are shipped to Kern County, Kings County, Riverside County, and San Diego County for agricultural land application. Grit and screenings have been hauled to the Chiquita Canyon and Simi Valley Landfills in Los Angeles County and the Prima Deshecha Landfill in southeastern Orange County. **Table 8-1** shows the District's annual land requirements for biosolids in 1997 and 2020 under the four treatment scenarios.

TABLE 8-1
1997 AND 2020 BIOSOLIDS VOLUMES BY TREATMENT SCENARIO

	Biosolids (1,000 Wet Tons per Year)			Annual Truck Loads /a/			Land Requirements for Beneficial Use (acres) /b/
	Plant 1	Plant 2	Total	Plant 1	Plant 2	Total	
1996/97	66	114	180	2,640	4,560	7,200	3,600
Projected to 2020							
Scenario 1	131	192	323	5,240	7,680	12,920	6,500
Scenario 2	160	182	342	6,400	7,280	13,680	6,800
Scenario 3	204	193	397	8,160	7,720	15,880	8,000
Scenario 4	205	216	421	8,200	8,640	16,840	8,500

/a/ Truck trips were estimated assuming 25 tons per truck.
/b/ Based on corn oats rotation and 10 dry tons per acre and 20% TSS.
SOURCE: OCSD, Strategic Plan, Vol. 8 Sec. 3

Projected increases in biosolids volumes and associated truck trips in 2020 relative to 1997 conditions could have environmental consequences, since both are expected to double or nearly

double, depending on which treatment scenario would be implemented. Grit and screenings volumes are expected to increase proportionally with increases in wastewater flows and do not vary by treatment scenario. Section 8.2 summarizes the regulatory background governing biosolids management and disposal. Section 8.3 discusses obstacles to biosolids land application and future biosolids opportunities under evaluation by the District. Section 8.4 evaluates the potential for environmental impacts to occur related to increased residual solids volumes.

The six levels of treatment scenarios evaluated in this EIR address the question of how much of the effluent flow will receive advanced primary treatment and how much will receive secondary treatment. As shown in **Table 8-1**, the land requirements in 2020 more than double under treatment Scenarios 3 and 4, and nearly double under Scenarios 1 and 2, relative to 1997 conditions. The increases in land requirements under these scenarios are correlated with the increases in amount of secondary treatment projected increase in influent volume. Based on increases in population in the District's service area, the District will need to accommodate the corresponding increases in effluent and biosolids volumes. **Tables 8-1** and **8-2** show existing and projected volumes of biosolids and grit and screening, respectively. Under the proposed Strategic Plan, the District would continue its existing biosolids management practices, but would also seek to secure additional land application sites and contracts to accommodate its increasing volumes. An analysis of the impacts related to any of the alternative biosolids management and treatment processes being evaluated by the District (see Section 8.3) would be speculative even though it is likely that some changes will occur. Therefore, any future changes to the management, processing or disposal of biosolids would be subject to subsequent environmental review.

TABLE 8-2
PROJECTED VOLUMES OF GRIT AND SCREENINGS

	Grit and Screenings (Wet Tons per Year)			Annual Truck Loads /a/		
	Plant 1	**Plant 2**	**Total**	**Plant 1**	**Plant 2**	**Total**
1996/97	760	1,040	1,800	30	42	72
Projections						
2000	820	1,122	1,941	32	44	77
2005	921	1,260	2,181	36	49	86
2010	1,001	1,370	2,372	39	54	93
2015	1,046	1,432	2,478	41	55	96
2020	1,088	1,489	2,576	42	57	99

/a/ Truck trips were estimated assuming 25 tons per truck.

SOURCE: OCSD, Strategic Plan, Vol. 8 Sec. 3

8.2 REGULATORY ENVIRONMENT

The processing and land application of biosolids is subject to federal, state and local regulations, ordinances and policies as described below.

FEDERAL

As required by the Clean Water Act Amendments of 1987, the U.S. Environmental Protection Agency (U.S. EPA) developed new regulations designed to protect public health and the environment from any potential impacts of certain pollutants that may be present in sewage sludge biosolids (herein referred to as "biosolids"). These regulations are found in Title 40 Code of Federal Regulations Part 503 (Part 503 Regulations). The Part 503 Regulations establish standards for the final use or disposal of biosolids generated during the treatment of domestic wastewater in a treatment plant. The regulations contain separate standards for management of wastewater residuals that are: (1) beneficially reused for soil enhancement through land application; (2) disposed of at dedicated sites or landfills; or (3) incinerated in incinerators.

For land application, the Part 503 Regulations identify three separate criteria: pollutant limits, pathogen reduction, and vector (e.g., flies, mosquitoes, and other potential disease-carrying organisms) attraction reduction. Any biosolids exceeding the established criteria cannot be land applied.

With respect to pathogen reduction requirements, the Part 503 Regulations specify alternative methods of reducing pathogen levels in biosolids to a level considered safe for land application. Subpart D of the regulations identifies criteria to classify biosolids as Class A or B with respect to pathogens. The method used to reduce pathogen levels in part determines the classification of the biosolids. The classifications are also based on the level of pathogens present in the biosolids. To achieve Class A pathogen reduction, the biosolids must meet an indicator bacteria standard of less than 1,000 fecal coliform per gram of dry solids, while Class B pathogen reduction must meet a standard of 2,000,000 fecal coliform per gram of dry solids or include a specific pathogen destruction process to significantly reduce pathogens (PSRP). Class B biosolids are restricted from use on food crops, feed crops, pastures, public access areas and turf. OCSD currently meets Class B requirements for its biosolids through a minimum of 15 days detention time in anaerobic digestion.

Reducing vector attraction in biosolids reduces the potential for disease transmission. The Part 503 Regulations require that one of 12 options for reducing the attractiveness of biosolids to vectors be met prior to land application (U.S. EPA, 1994). These options determine whether the biosolids are Class A or B with respect to vector attraction. Of the 12 options identified, OCSD achieves vector attraction reduction for its Class B biosolids through greater than 38 percent volatile solids reduction with anaerobic digestion (Option 1, 40, CFR Part 503.33(b)(1)).

The Part 503 Regulations establishes risk-based pollutant limits as the last criteria for biosolids that are to be land applied. Any biosolids with pollutant concentrations greater than the ceiling

concentrations defined in Section 503.13 of the Part 503 Regulations cannot be land applied. The ceiling concentration limits are set for 9 heavy metal pollutants. These include arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc. The heavy metal pollutant concentrations in OCSD biosolids are currently below Part 503 Regulations ceiling concentrations.

Taken together, the pathogen reduction, vector attraction reduction, and pollutant limit standards define the quality of biosolids, and the conditions under which they can be applied to land. Biosolids are designated "exceptional quality" (EQ), if they meet the highest standard for pollutant limits, meet Class A pathogen reduction standards, and achieve one of the first eight options for vector attraction reduction. In addition to meeting quality criteria, there are monitoring, recordkeeping, and reporting requirements that must be met. Generally, EQ biosolids can be land applied without restriction.

The Part 503 Regulations are self-implementing in that biosolids producers, land appliers, owners/operators of surface disposal sites, and biosolids incinerators must comply with all of the provisions of the regulations, regardless of whether state or local permits have been issued covering biosolids use or disposal. By February 19, 1994, full compliance with the Part 503 Regulations was required. In California, compliance with the federal regulations is achieved through self-regulation, Waste Discharge Requirements issued by Regional Water Quality Control Boards, and local regulations.

STATE

California does not have a single agency, such as the U.S. EPA, that regulates biosolids disposal and reuse. Instead, biosolids are regulated at the state level by Regional Water Quality Control Boards and the California Integrated Waste Management Board. A number of other state agencies also play a role in biosolids management. The roles and responsibilities of applicable state agencies are described below.

DEPARTMENT OF TOXIC SUBSTANCES CONTROL

In accordance with the California Hazardous Waste Control Law (HWCL), the Department of Toxic Substances Control (DTSC) is responsible for determining whether sewage sludge/biosolids are a hazardous or non-hazardous material per the California Code of Regulations (CCR) Title 22, Article 11. Title 22 defines "sludge" as follows:

> "... any solid, semisolid, or liquid waste generated from a municipal, commercial, or industrial wastewater plant...exclusive of treated effluent from a wastewater treatment plant."

The criteria DTSC uses to determine whether a sludge is classified as a hazardous waste includes testing for: toxicity, persistent and bioaccumulative toxic substances, ignitability, reactivity, and corrosivity. Any waste that contains a substance that exceeds either a listed soluble threshold limit concentration (STLC) or a listed threshold limit concentration (TLC) is deemed a hazardous

waste. Most municipal sludges, including those produced by OCSD, are classified as non-hazardous. Determining whether a sludge is hazardous or not is key to identifying available disposal and reuse options.

STATE WATER RESOURCES CONTROL BOARD AND REGIONAL WATER QUALITY CONTROL BOARDS

The State Water Resources Control Board (SWRCB) administers CCR Title 23, Division 3, Chapter 15 (Discharges of Waste to Land), which governs the disposal of wastes in a landfill or on dedicated land disposal sites. Chapter 15 requires that all wastes be classified to determine the appropriate type of waste management strategy. The classification of materials as hazardous or non-hazardous is, again, the responsibility of the DTSC; however, the SWRCB and its nine Regional Water Quality Control Boards (RWQCBs) may further classify DTSC non-hazardous wastes, such as wastewater sludge, as a designated waste. The solids content of non-hazardous sewage sludge determines the type of landfill that can be used for disposal. The Chapter 15 regulations also address the use of dried sewage sludge as daily landfill cover. RWQCBs play a role in issuing Waste Discharge Requirements (WDRs) or waivers for land application sites, inspecting and monitoring such sites, and providing enforcement, as necessary.

OCSD currently operates under a National Pollution Discharge Elimination System (NPDES) permit (RWQCB Order No. 98-5) issued by the Santa Ana RWQCB. With respect to residual solids, the NPDES permit requires that the District prepare a monthly report identifying the volume of material removed from the wastewater and the location where these materials were taken. The NPDES permit also requires that, at least twice a year, composite samples of the biosolids from each plant be analyzed for all priority pollutants (County Sanitation Districts of Orange County, 1998).

CALIFORNIA INTEGRATED WASTE MANAGEMENT BOARD

The California Integrated Waste Management Board (CIWMB) administers solid waste regulations set forth in CCR Title 14 that pertain to composting operations and facilities. Title 14, Chapter 3.1, Composting Operations Regulatory Requirements, apply when biosolids are mixed with other feed stocks for composting. These regulations specify permitting, siting and design, operating standards, sampling requirements, metal concentrations and pathogen reduction standards. CIWMB regulations are implemented through its Local Enforcement Agencies (LEA). LEAs issue Solid Waste Facilities Permits (SWFP) for disposal sites.

In addition to disposal site regulation, CIWMB staff oversee source reduction and recycling efforts of jurisdictions throughout California. Public Resources Code (PRC) Section 40000 *et seq.* implements Assembly Bill 939 (AB 939) legislation. Under Section 41750, cities and counties were required to begin planning to achieve solid waste reduction immediately to manage remaining landfill space in an effective and environmentally sound manner. PRC Section 40191 defines "solid wastes" as follows:

> "... all putrescible and non-putrescible solid, semisolid, and liquid wastes excluding hazardous waste."

Solid wastes by this definition include dewatered, treated, or chemically fixed sewage sludge.

AB 939 promotes the use of source reduction, source separation, diversion, recycling, reuse, composting, and co-composting of solid waste to the maximum extent feasible to conserve water, energy and other natural resources, and to protect the environment. AB 939 requires jurisdictions to divert 25 percent of their generated waste by 1995 and 50 percent by 2000. For many jurisdictions in California, land application of biosolids serves as a means of achieving these diversion rates.

DEPARTMENT OF HEALTH SERVICES

The California Department of Health Services (DHS) does not itself have regulatory authority over biosolids management, but has established good management procedures to follow. Generally speaking, DHS acts in an advisory role on pathogen/health standards. In April 1983, DHS issued the *Manual of Good Practice of Landspreading of Sewage Sludge*. The manual presents guidelines on trace contaminants, the application of biosolids to food chain crops, control of disease transmission, use of biosolids for land reclamation and non-food-chain crops, and distribution and marketing of biosolids for unrestricted use. DHS guidelines include stricter limitations on cadmium than those specified in the Part 503 Regulations (i.e., 25 mg/kg rather than 39 mg/kg). Also, DHS guidelines recommend limitations on PCBs in biosolids, whereas the Part 503 Regulations do not.

CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE

With respect to biosolids, the major role of the California Department of Food and Agriculture (CDFA) is to ensure consumer protection and to act as an advisory on fertilizer application. All agricultural products derived from sludge are regulated as fertilizers and are subject to the requirements of the Food and Agriculture Code (CDFA, et.al., 1997). Chapter 5 of the State's Food and Agriculture Code specifies requirements relating to the manufacturing, guaranteeing, labeling, distribution, tonnage reporting, and inspection of fertilizing materials. Section 14505 of the Food and Agricultural Code states that agricultural products derived from municipal sewage sludge must be regulated as fertiziling materials, and when used in general commerce, the products are not subject to regulation as a hazardous substance (City of Modesto, 1997). Regulations implementing the Food and Agriculture Code are contained in Title 3 of the CCR. CDFA is currently developing organic fertilizer standards for constituent concentrations. These standards, which will include biosolids, are anticipated to be in place by December 1999.

LOCAL

As described earlier in this chapter, OCSD ships its Class B biosolids to Kern County, Kings County, Riverside County, and San Diego County for agricultural land application. Grit and

screenings are hauled to the Simi Valley Landfills in Los Angeles County and the Prima Deshecha Landfill in southeastern Orange County.

At present, 19 of the 58 counties in California have some type of biosolids regulation that applies to land application. **Figure 8-1** shows the types of biosolids regulations throughout California by county. The categories shown on **Figure 8-1** are defined below:

Actual Ban – County regulation bans land application of biosolids within the county.

Practical Ban – While no specific regulation exists, County staff attitudes and policies severely limit land application.

Restricted Use – Land application of biosolids restricted to Class A and requires a site-specific EIR, extensive permitting and/or County special use permit.

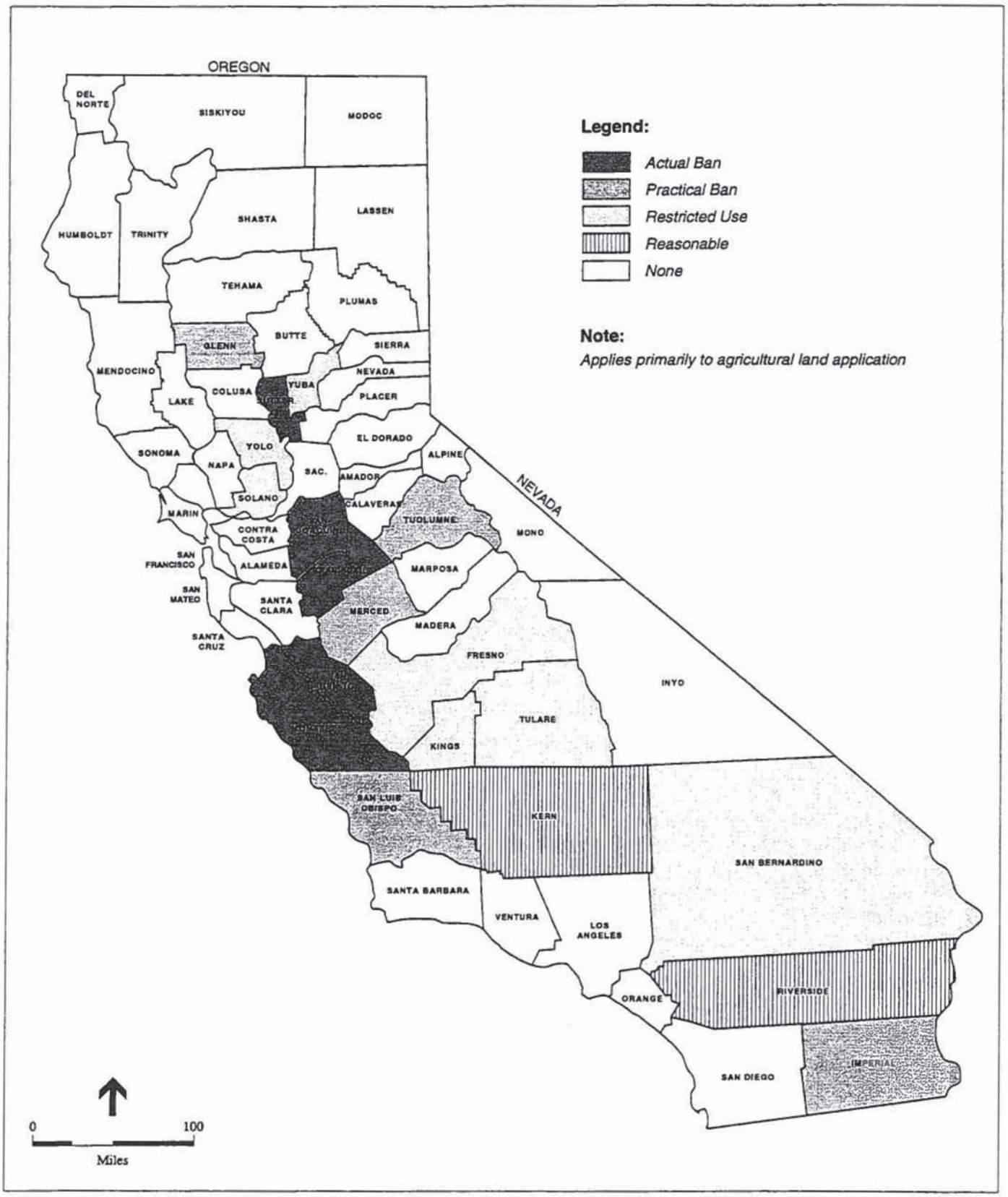
Reasonable Regulations – County relies on Part 503 Regulations for guidelines for land application of biosolids.

None – County has no specific regulations, but may still require a special use permit.

As shown on **Figure 8-1**, the counties used by OCSD either have no regulations or what is referred to as reasonable regulations. The increase in the number of local regulations has in part made the future of biosolids application uncertain. Local governments, particularly county governments in California, have begun to establish their own biosolids land application regulations more stringent than those found in the Part 503 Regulations. Adoption of the new Kern County Ordinance would require the District to modify its processes so as to meet the stricter requirements or to seek other land application options. Implications of these new county regulations could include:

- Requirements for testing and reporting, before during and after land application;
- Setback requirements that mean more land is needed, with reduced value of biosolids to the farmer;
- Restrictions for biosolids storage at the application site;
- Inspection fees;
- Requirement that haul vehicles must be registered; permitted, and labeled as biosolids haulers;
- Potential outright ban of biosolids land applications.

In light of increasing biosolids regulation, biosolids land application may become cost prohibitive in the near future.



SOURCE: OCSD, Strategic Plan, volume 8, 1998.

OCSD Strategic Plan Program EIR / 960436 ■

Figure 8-1
California County Biosolids Regulations

8.3 BIOSOLIDS MANAGEMENT OBSTACLES AND OPPORTUNITIES

BIOSOLIDS MANAGEMENT CONSTRAINTS

Initially, the promulgation of the Part 503 Regulations made it easier to develop and permit beneficial reuse land application projects. The future of land application is, however, uncertain due to a number of constraints, including a negative public perception of the risks of land application, development of local government regulations (including bans on application), and other constraints. The major constraints are characterized below.

PUBLIC PERCEPTION

There is a misconception in the public that there is a greater risk involved with the application of Class B biosolids than Class A biosolids. In particular, the public has expressed concerns regarding heavy metals, organics, pathogens, odors, vectors, radioactivity, and water contamination. The public perception is largely fueled by a lack of understanding of biosolids, and scientific discussion from Class A competitors. As a marketing strategy, Class A biosolids producers often send a negative message to the public regarding Class B materials (OCSD, 1989). The District interprets the Part 503 Regulations as requiring Class B biosolids to be used in combination with certain site restrictions that result in the same level of public health and environmental safety as Class A biosolids.

LOCAL GOVERNMENT REGULATIONS

As described in Section 8.2, an increase in the number of local ordinances has made the future of biosolids application uncertain. Increasing regulations in combination with increasing competition for land application sites will make if will difficult to find land application sites for Class B biosolids.

STATE ENVIRONMENTAL IMPACT REPORT

Another constraint to future land application may come from any findings of the Statewide Environmental Impact Report being prepared for biosolids management and handling. In 1995, the Central Valley Regional Water Quality Control Board (CVRWQCB) began a streamlined system for permitting land application sites that included granting waivers for the land applicatio of Class A biosolids. The CVRWQCB effectively declared that there were no adverse environmental impacts and that these new permits were exempt from the environmental review process. The Central Delta and South Delta Water Agencies filed a successful lawsuit challenging the adequacy of CVRWQCB's general waste discharge permits for biosolids. The SWRCB was asked by the courts to review the practice of general permits and to prepare an EIR to examine potential environmental impacts. By that time, the CVRWQCB had already permitted

roughly 54,000 acres of land for biosolids application under its streamlined process. The courts ruled that the grandfathered acreage could be used as long as an EIR was prepared within three years of the ruling or by not later than October 2000. The SWRCB is now overseeing the preparation of the EIR that is due for publication in mid-1999. Until the EIR and its conclusions are made public, there is a shadow of uncertainty over existing CVRWQCB general waste discharge permitted sites and future land application sites for beneficial uses. The results of the EIR could affect the District's future in biosolids management.

BIOSOLIDS MANAGEMENT OPPORTUNITIES

Based on the constraints described above, the District has begun to evaluate other biosolids management opportunities. The District's approach to the future has included establishing short- and long-term goals of reliability, beneficial reuse, low costs, and an in-county solution. Of these goals, reliability is considered the most important. Three options are being considered by the District to achieve these goals:

1) Improvements to the treatment works to make land application less expensive and more reliable;
2) Improvements to the treatment works to minimize solids production and maximize dewatering; and
3) Addition of processes that could produce a higher quality product. The changes could be at the plants or offsite by OCSD or a private contractor.

The District is researching market opportunities for Class A and B biosolids and has considered obtaining Class A treatment levels. Higher quality biosolids products open opportunities in local and statewide markets for soil amendments and fertilizers. The cost benefits of participating in these markets could prove to have a major impact in the future. Options of future management and processing are described below.

CHANGES TO EXISTING BIOSOLIDS MANAGEMENT

The threat of increasing biosolids management costs in the future has caused the District to consider changes to its existing biosolids management structure. The changes being considered are described below.

Taking Over One or More Aspects of the Land Application Process

The District could eliminate use of some of the contractors currently involved in getting biosolids from its treatment facilities to land application sites. The volume of biosolids generated by its two plants requires a complex combination of land application sites, hauling routes, and trucks. It is speculative to assume there would be any major cost savings with this approach.

OCSD Ownership of Land Application Sites

The District could acquire a site(s) to be dedicated to land application of OCSD's biosolids. Ownership of a dedicated site could improve reliability for future land application and could

reduce anticipated cost increases. Ownership of a site would allow the District to select a site based upon its compatibility with existing and potentially more restrictive federal, state and local regulations, and would allow the District to have permanent control of the land, thereby eliminating the competition it faces at other land application sites. The District is currently considering purchasing dedicated land application sites Kern County.

Rail-Haul Options

Alternative transportation methods, such as rail-haul, could meet OCSD's goal of reliability, beneficial reuse, lower cost and serve as an in-county solution. Rail-haul could be used to transport biosolids to other counties or out of state if land application in California becomes more restrictive. Under a rail-haul scenario, trucks would be used to haul dewatered biosolids to railcars for delivery to a final destination (OCSD, 1998). The process of developing and permitting a rail-haul site and the costs associated with additional material handling for such uses brings into question the viability of this alternative.

Process Changes

In addition to considering management changes, the District is evaluating changes in treatment processes at Plants 1 and 2 that could lower biosolids management costs and produce higher quality biosolids. The proposed Strategic Plan outlines several process changes that could potentially increase the District's biosolids quality from Class B to Class A and improve operational efficiency. The processes under consideration are generally refinements to the anaerobic digestion process. The process changes under consideration would achieve as many as three separate goals. These include:

- Reducing the amount of water (i.e., increasing cake dryness) to be hauled
- Increasing digester and stabilization capacity and efficiency
- Enhancing pathogen destruction to produce Class A biosolids

Some of the process technologies under evaluation by the District are listed below.

Anoxic Gas Flotation
Autothermal Thermophillic Aerobic Digestion
Centrifuges
Drying
Fuel Cells
KADY Process
Micronair
Prepasteurization
Pulse Power
Temperature-Phased Anaerobic Digestion
Thermophillic Digestion
Two-Phased Anaerobic Digestion

Some of these processes are innovative and require future study to determine their viability. Volume 8 of the Strategic Plan provides a brief description of each of these processes and their state of development.

NEW BIOSOLIDS MANAGEMENT OPPORTUNITIES

OCSD is also considering new biosolids management strategies, including a review of potential in-county reuse options and alternatives to creating higher quality biosolids. The alternatives and

processes described below focus on technologies that are different from what OCSD currently uses.

Landfill Options

In the future, landfills may be the only in-county facilities that can beneficially use Class B biosolids. Once delivered to a landfill, biosolids can either be used as daily cover material or can be directly landfilled. CIWMB regulations require that all landfills have a cover that must be place over refuse each day. A number of types of covers are available, including soil, tarps or plastic, foams, or green wastes. The CIWMB reviews and approves requests for the use of different types of cover materials. At present, none of the landfills in Orange County use biosolids as a daily cover for landfills, and only one landfill accepts a limited amount of biosolids for disposal. Use of District biosolids for daily cover at County landfills would be counted as diversion with respect to the AB 939 diversion mandates.

Heat Drying

Heat drying would allow the District to create a Class A biosolid that is marketable as a fertilizer component or soil conditioner. This process reduces, through heating at high temperatures, the volume and moisture content of biosolids and meets Part 503 Regulations for Class A pathogen and vector attraction reduction criteria if the required level of drying is achieved.

Air Drying

Air drying would allow the District to create a Class A biosolid through prolonged exposure to sunlight and warm air if the required level of drying is achieved. Based on the time it takes to achieve proper drying, this option is land intensive and has associated odor and air emissions of concern.

Alkaline Stabilization

This option includes raising the biosolids pH and temperature to create a Class A biosolid. This technology relies on the addition of alkaline materials to reduce pathogens and vector attraction to Class A standards.

Cement-Kiln Injection

This technology involves incorporating dewatered biosolids into a cement manufacturing process. Here, ash residues are incorporated into cement products.

8.4 CUMULATIVE EFFECTS

In Southern California, nearly all wastewater agencies currently use land application for all, or at least part, of their biosolids management needs. At present, the combined volume of biosolids applied to land by these agencies, including OCSD, is roughly 3,600 wet tons per day. At 500

tons per day, OCSD produces approximately 14 percent of the total biosolids for land applied by these agencies.

Many of the other Southern California wastewater agencies will have the same expansion needs based on regional growth projected by local jurisdictions. Cumulative demand for land application sites from wastewater treatment facilities of Southern California is expected to be significant. If the estimated amount of future biosolids from Southern California were all to go to agricultural land application sites, the land area needed would exceed 50,000 acres by 2020 (OCSD, 1998). For these reasons, the need for suitable land application sites is expected to increase significantly over the next decade.

8.5 POTENTIAL ENVIRONMENTAL IMPACTS ASSOCIATED WITH FUTURE RESIDUAL SOLIDS/BIOSOLIDS MANAGEMENT

This analysis considers the potential for environmental impacts to occur related to the increase in volume of residual solids to be handled in 2020 relative to 1997 conditions. The analysis assumes the District would continue to land apply its biosolids at land application sites and dispose of grit and screenings and digester cleanings in landfills permitted to accept such wastes. Since land application sites and landfills are subject to their own environmental review and permitting, the impact discussion that follows is limited to impacts that could occur at the treatment plants and during transport of the increased volume of materials. Section 6.5, Air Quality, discusses the potential for the projected increases in residual solids volumes and related truck traffic to generate odors and air pollutant emissions that would adversely affect air quality.

Impact 8-1: The projected increase in residual solids volumes associated with the projected increase in influent volume would place demands on landfill capacity that might otherwise be available for municipal refuse disposal. Less than Significant.

The proposed Strategic Plan calls for the continuance of the current disposal and reuse practices for residual solids, but with an increased volume of material. This assumes that the District would continue to land apply its biosolids. As shown in **Table 8-1**, the amount of land that would be required to dispose of the District's projected increases in biosolids volumes in 2020 varies by treatment scenario. The amount of land (in acres) required for land application would more than double relative to 1997 conditions under each of the treatment scenarios. The continued use of land application as a means of disposal would continue to preserve precious landfill capacity. The application of biosolids on land does not consume land resources, since land receiving direct application of biosolids can continue to be used for growing crops. Such land can be used for other uses in the future. Land use restrictions placed on land application sites are related to public access and the type of crops that can be grown within a limited time frame after the last application of biosolids.

Because land application of biosolids would beneficially reuse materials that may otherwise be landfilled, the biosolids tonnages generated by Plants 1 and 2 could substantially contribute to the

stretch of roadway and could be exposed to noise from truck activities. Brookhurst Street and Ellis Avenue are both heavily traveled roadways.

With respect to noise, a doubling of a noise source (e.g., 400 auto passby events compared to 200 auto passby events in an hour) results in an increase of three dBA. In general, a change of 3-dBA is a noticeable difference and a change of 10-dBA is heard as a doubling of noise.

Table 8-3 shows the estimated number of daily truck trips related to biosolids transport at each of the plants by treatment scenario in 2020 relative to existing conditions. As shown in **Table 8-3**, the combined truck traffic volumes from both plants would double from existing conditions under each of the treatment scenarios, except Scenarios 1 and 2, where truck volumes would nearly double. The distribution of the truck trips over a 24-hour period is unknown. Truck trips occurring during nighttime noise-sensitive hours (between 10:00 p.m. and 7:00 a.m.) would adversely affect ambient noise levels along haul routes, since during those hours background traffic volumes would be at a minimum and considering the greater annoyance of nighttime noise as compared to daytime noise.

Because traffic volumes would double (or nearly double) under each of the treatment scenarios, which would suggest a potential increase in noise levels and truck trips could occur during the most noise-sensitive period of the day, this could be a potentially significant impact. The increase in noise levels along Ellis Avenue, adjacent to Reclamation Plant No. 1, would not adversely affect the noise environment of nearby sensitive receptors, since the land uses in this area primarily consist of commercial and light industrial uses. Increases in biosolids truck activity at Treatment Plant No. 2 could expose residences along Brookhurst Street to additional truck noise, which is typically louder and more annoying than noise associated with automobiles. This would be a significant noise impact.

Truck trips related to the transport of grit and screenings to landfills would occur less than once a day and would have a negligible impact on traffic and ambient noise levels at nearby sensitive receptors.

EIR-Identified Mitigation

Measure 8-3a: The District shall limit truck trips associated with the transport of residual solids at Treatment Plant No. 2 to non-noise sensitive (daytime) and non-peak hour periods as a means of reducing exposure of residences to truck-related noise whenever possible.

Measure 8-3b: The District shall investigate options for reducing the number of biosolids truck trips at Treatment Plant No. 2. The study could focus on evaluating such practices as using underground pipelines to pump biosolids from Plant 2 up to Plant 1 and rail-hauling the materials from the site.

***Significance After Mitigation*:** Less than Significant.

Impact 8-4: The projected increase in residual solids volumes could adversely affect water quality at land application sites and landfill disposal sites. Less than Significant.

With land application of biosolids, trace quantities of metals and potentially toxic organics are placed back onto the land in small increments. The amount of contaminants contained in the District's biosolids would vary under the different treatment scenarios. It is evident, that the more advanced treatment scenarios return a greater burden of toxic materials to the land than the primary treatment scenarios, as more contaminants are taken out of the wastewater and put into the soil. Under treatment scenarios 1 and 2, which provide the least amount of secondary treatment, a greater proportion of this material is discharged to the ocean with the wastewater effluent. The toxicity hazards related to land application of sludge is considered to be less than significant, when appropriate land application guidelines are followed and RWQCB's Waste Discharge Requirements (WDRs) are met by the site operators.

Mitigation Measures

No mitigation measures are required.

Impact 8-5: The projected increase in biosolids production from POTWs in the Southern California region could present a cumulative impact on the availability of land application sites. Less than Significant with Mitigation.

The cumulative impact of residual solids volume in the Southern California region is considered a secondary impact from growth. The City of Los Angeles, the County of Los Angeles, OCSD, and the City of San Diego each operate large POTWs situated in close proximity along the fast growing Southern California coast. The biosolids management options and current regulatory activity discussed in previous sections of this Chapter provide a perspective on the framework currently in place in the region to reconcile the issue. Many land application reuse options exist for biosolids which will be explored in the future on a regional level.

EIR-Identified Mitigation

Measure 8-5a: The District will continue to research land application sites in the region and consider the management options presented in this Chapter including the acquisition of dedicated application sites.

Measure 8-5b: The District will continue to coordinate with other POTWs in the region to cooperatively research innovative ways to solve land availability issues.

***Significance After Mitigation*:** Less than Significant.

REFERENCES - RESIDUAL SOLIDS/BIOSOLIDS MANAGEMENT

California Integrated Waste Management Board, http:/www.ciwmb.ca.gov/swis/, April 1999.

City of Modesto, *Notice of Preparation for the Draft Environmental Impact Report for the Land Application of Class A EQ Biosolids*, April 16, 1997.

CDFA, et.al., 1997 California Biosolids Conference Reference Materials, January 21, 1997.

County Sanitation Districts of Orange County, *Operations & Maintenance, Annual Report,* 1998.

OCSD, *Strategic Plan, Volume 8, Biosolids Management*, prepared by Camp Dresser and McKee (CDM), 1998.

U.S. EPA, *A Plain English Guide to the EPA Part 503 Biosolids Rule*, September 1994.

CHAPTER 9

ALTERNATIVES TO THE PROPOSED PROJECT

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ALTERNATIVES TO THE PROPOSED PROJECT

9.1 INTRODUCTION

The CEQA *Guidelines* provide guidance for the discussion of alternatives in Section 15126. Section 15126.6(b) of the CEQA *Guidelines* states that:

> *Because an EIR must identify ways to mitigate or avoid the significant effects that a project may have on the environment, the discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly.*

The range of alternatives to be analyzed in an EIR is guided by Section 15126.6(f), which states:

> *The range of alternatives required in an EIR is governed by a "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice. The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of the project. The range of feasible alternatives shall be selected and discussed in a manner to foster meaningful public participation and informed decision-making.*

Consideration of the No Project Alternative is specifically required by Section 15126.6(e)(1) of the CEQA *Guidelines*. The No Project Alternative does not necessarily mean that no actions with regards to wastewater treatment or upgrades would be undertaken in the future. The No Project Alternative at this program level assumes that, in the absence of adopting the updated Strategic Plan, the District would continue to implement the 1989 Master Plan previously adopted by the District. The purpose of evaluating the No Project Alternative is to allow decision-makers to compare the impacts of the proposed project with the impacts that would occur without implementation of the proposed project.

Two types of alternatives that may be reviewed in an EIR are: (1) alternatives *of* the project which include modified project components, such as alternative project sites or processes and/or modified facilities, layout, size and scale of the proposed project; and (2) alternatives *to* the project which are other projects entirely or other approaches to achieving the project objectives rather than the project or modified project.

Section 9.2 identifies the objectives for the proposed project, and provides a context for examination of the various project alternatives with respect to these objectives. Section 9.3 highlights the key significant impacts of the project, which are considered in evaluating whether an alternative could avoid or lessen such impacts.

9.2 PROJECT OBJECTIVES

The objectives for the Strategic Plan of 1999 are:

- To plan for wastewater collection, treatment, and disposal facilities to serve the needs of the OCSD service area through 2020.
- To ensure compliance with existing and anticipated permit conditions, including the requirements of the 301(h) modified (secondary treatment waiver) NPDES permit for discharge (the largest in the U.S. and one of four in California).
- To recommend projects that meet the community's needs, protect public health, are technically feasible, and are cost effective and environmentally responsible.
- To maximize the use of treated effluent for water recycling.

All six treatment scenario alternatives would meet the first three program objectives. Scenarios 1 and 2 would be less expensive than Scenarios 3, 4, 5, and 6 because they provide less secondary treatment facilities. Scenarios 2, 4, and 6 meet the last objective by supporting the GWR System project, a major, regional water recycling project. Scenarios 1, 3, and 5 would not support the GWR System.

9.3 POTENTIALLY SIGNIFICANT IMPACTS OF THE PREFERRED ALTERNATIVE

As discussed in Section 9.1, Introduction, CEQA requires a review of alternatives that could avoid or reduce the significant impacts of the proposed, preferred project. The significant impacts of the are summarized below to guide and be used in the discussion of alternatives.

1. Potential increase in whole effluent toxicity due to increasing cumulative brine contributions from the GWR System Project and other regional desalting projects. (Significant, mitigable)
2. Increases in oil and grease levels in the ocean discharge would approach but stay within numeric permit limits but could cause observable floating particles which would be a violation of permit conditions. (Significant, mitigable)
3. Short-term beach closures potentially occurring during infrequent use of the 78-inch outfall during peak wet weather overflow events. (Significant, unavoidable)

4. Air quality emissions from treatment plant construction activities would exceed criteria pollutant standards, causing temporary but significant and unavoidable impacts. (Significant, unavoidable)

5. Increase in vehicle trips (delivery trucks and hauls trucks) associated with expanded treatment plant operation would result in air emissions from these mobile sources that would exceed air quality standards for Nitrous Oxides. (Significant, unavoidable)

6. Temporary noise and vibration impacts from construction of treatment facilities would be partially mitigated by measures proposed by the District, but would remain significant and unavoidable. (Significant, unavoidable)

7. Some of secondary effects of planned growth identified in EIRs on the General Plans for the cities within the OCSD service area were considered significant and unavoidable. This impact would be the same under the No Action Alternatives. (Significant, unavoidable)

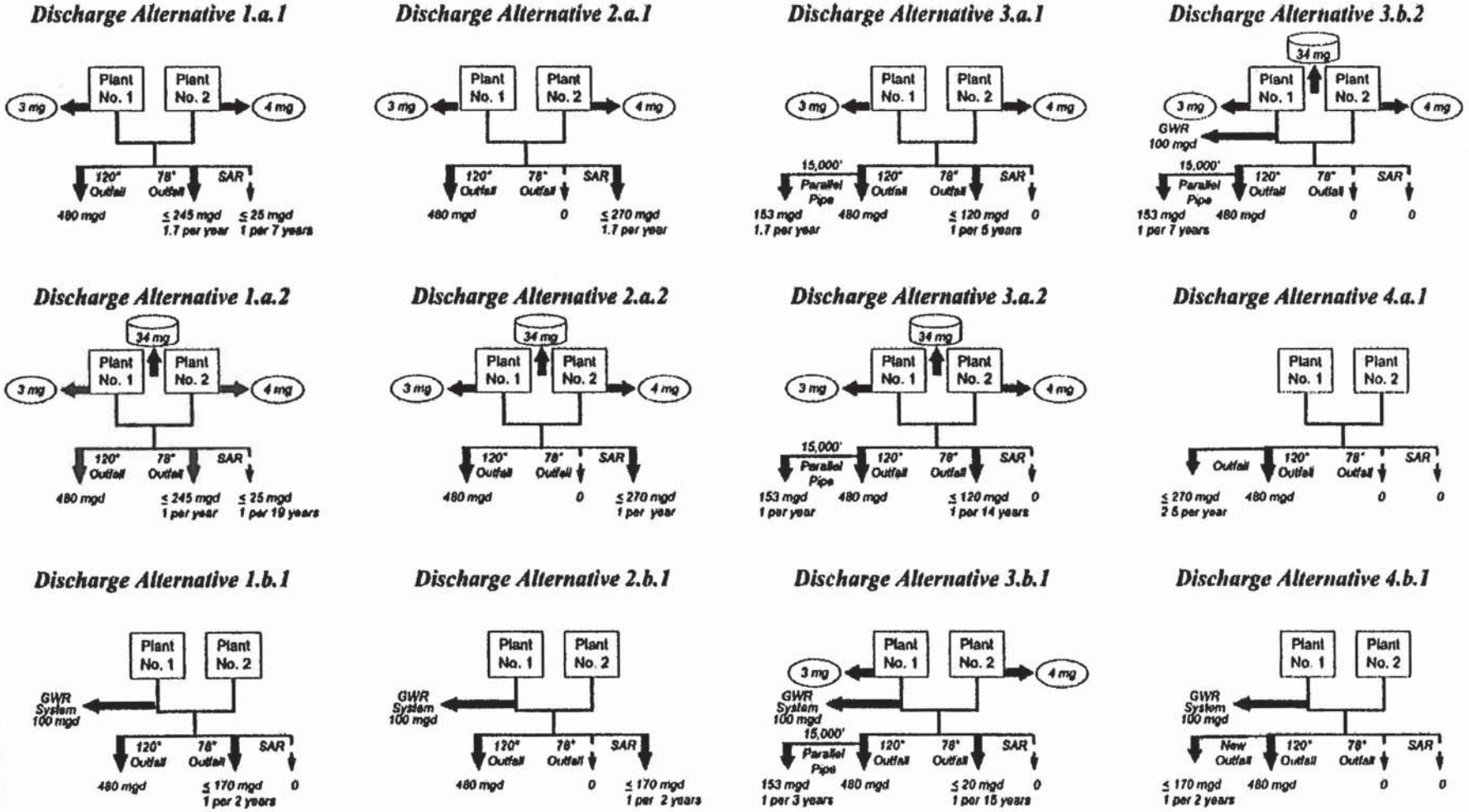
9.4 DESCRIPTION OF ALTERNATIVES

As part of the Strategic Plan process, several alternatives for each system component as well as several alternative plans consisting of different combination of the alternative components were evaluated. Table 9-1 summarizes the chief alternative system components considered in the updated Strategic Plan. Figure 9-1 (Strategic Plan Figure 6-6) summarizes the range of peak wet-weather-disposal alternatives considered in the Strategic Plan and Figure 9-2 summarizes the costs associated with these alternative disposal programs.

The Preferred Alternative and the No Project Alternative are briefly described here. The other alternatives are described in Section 9.5 as needed in the review of these alternatives in light of the their ability to avoid or reduce the significant impacts identified for the .

PREFERRED ALTERNATIVE

The Preferred Alternative recommended by OCSD staff and the Planning Advisory Committee (PAC) and designated by the District's Board consists of the components shown on Table 9-1. The main components of the preferred program are: upsizing the existing trunk sewers, Scenario 2 treatment for NPDES permit compliance, GWR System Phase 1 implementation, use of the 78-inch outfall for infrequent peak wet-weather discharges, and continue beneficial reuse of biosolids.



SOURCE: OCSD 1999 Strategic Plan, Volume 3.

Figure 9-1

Disposal Alternatives - Year 2020

Collection System	Treatment Facilities	Storage	Outfall
1 Straight Upsizing	1 Scenario 1 (w/o GWR) *$350,000,000*	1 0 MG *$0*	1 Use the 78-Inch *$28,200,000*
2 Super-Bushard	2 Scenario 2 (w/ GWR)* *$475,000,000*	2 7 MG *$0*	2 Use SAR *$26,500,000*
3 Super-SARI		3 40 MG *$54,300,000*	3 15,000-Ft Barrel *$108,700,000*
4 Super-Newhope			4 New 120-Inch *$149,500,000*
5 Super-Euclid			

Alternatives	Collection System	Treatment Facilities	Storage Option	Outfall Option	Estimated Cost **	Estimated O&M Cost ***	Frequency of Use	
							78"	SAR
Planned Use of the 78/SAR								
1a1	**	1	2	1	$608.2m	approx. $40m	1.70	0.14
1a2	**	1	3	1	$662.5m	approx. $40m	1.00	0.05
2a1	**	1	2	2	$606.5m	approx. $40m	0.00	1.70
2a2	**	1	3	2	$660.8m	approx. $40m	0.00	1.00
Emergency Use of the 78/SAR								
1b1	**	2	1	1	$733.2m	approx. $40m	0.50	0.00
1b2	**	***2***	***2***	***1***	***$733.2m***	***approx. $40m***	***0.30***	***0.00***
1b3	**	2	3	1	$787.5m	approx. $40m	0.14	0.00
2b1	**	2	1	2	$731.5m	approx. $40m	0.00	0.50
3a1	**	1	2	3	$688.7m	approx. $40m	0.20	0.00
3a2	**	1	3	3	$743.0m	approx. $40m	0.07	0.00
3b1	**	2	2	3	$813.7m	approx. $40m	0.07	0.00
3b2	**	2	3	3	$868.0m	approx. $40m	0.00	0.00
4a1	**	***1***	***1***	***4***	***$729.5m***	***approx. $40m***	***0.00***	***0.00***
4b1	**	2	1	4	$854.5m	approx. $40m	0.00	0.00
Today								
1998		1	2	1	—	—	0.65	0.00

** Phase I costs only. Used $125m for CSDOC's GWR contribution*

*** For discussion purposes, assumed $230m for collection system component*

**** Scenario 1 or 2, treatment only (1998 dollars)*

SOURCE: OCSD 1999 Strategic Plan, Volume 3.

Figure 9-2
Year 2020 Disposal Alternatives
Summary and Costs

NO PROJECT ALTERNATIVE

The No Project Alternative for the OCSD strategic planning efforts would be continued implementation of the District's existing adopted program from the 1989 Master Plan, including continued treatment in accordance with the 50:50 blend policy and continued collection system improvement and plant expansion to accommodate planned growth service needs. The CEQA *Guidelines,* Section 15126.6(e)(3)(A) and (B) indicate that the No Project Alternative in certain cases can be considered as the continuation of previously approved planning policies. In light of this CEQA guidance, this analysis has not considered the termination of capital improvements planned in the 1989 Master Plan as an alternative.

Treatment Scenarios 5 and 6, 50:50 blend, represent the No Project Alternative in terms of treatment level. Scenario 6 incorporates the GWR System Project Phase 1, Scenario 5 does not. Under the No Project Alternative the District would continue this treatment level, which would comply with its current NPDES permit for ocean discharge.

Under the No Project Alternative, OCSD would continue to improve the collection system to eliminate conveyance deficiencies and handle wet-weather flows. About half of the collection system projects included in the 1999 Strategic Plan are the same as those previously analyzed and adopted as part of the 1989 Master Plan. Under the No Project Alternative, collection system projects would have similar temporary community disruption impacts as those proposed in the , although fewer trunk sewers would be worked on. The District now has more current and accurate information about the collection system deficiencies and therefore has identified additional projects to improve the system. Under the No Project Alternative, without these additional system improvements, the risk of a sewage spill within the collection system would increase -posing both a human health and environmental health concern.

With respect to water reuse, the adopted 1989 Master Plan also recommended the District's active participation in and expansion of water reuse projects. That plan considered options for upstream, water reclamation plants to support non-potable reuse throughout the service area. These options are no longer under consideration. The GWR System Project concept had not been developed at the time of the 1989 Master Plan. However, given the District's adopted policy to support additional reuse, it is reasonable to assume that under the No Project Alternative, the District would still participate with OCWD in the development and implementation of the GWR System Project.

With respect to peak wet-weather management, the 1989 Master Plan recommended construction of the second 120-inch outfall as part of the long-term program. Therefore, under the No Project Alternative, the District would continue to evaluate the timing and need for implementing this program component and would initiate design studies when appropriate.

TABLE 9-1
SUMMARY OF ALTERNATIVES

Alternative	Collection System	Treatment Level / Effluent Quality	Water Reuse	Peak Wet Weather Flow Management	Ocean Disposal	Residuals Management
PREFERRED ALTERNATIVE	"Base Case" - Upsizing existing trunk sewers Manhole rehabilitation	Scenario 2 - Produce a blend of primary and secondary effluent that meets NPDES permit requirements for ocean discharge. Optimize secondary treatment capacity to support GWR System.	Continue existing reuse programs: GAP and Talbert saltwater intrusion barrier. Implement GWR System – Phase 1.	Implement 13 mgd conservation by 2020. Implement 20% I/I reduction by 2020. Utilize and maximize existing in-plant storage. Participate in GWR System - Phase 1. Use 78-inch outfall for infrequent wet weather discharge.	Use existing 120-inch outfall. Use 78-inch outfall for infrequent wet weather discharge with an estimated probability of once every 3 years by the year 2020.	Continue existing beneficial reuse program for land application of biosolids to the extent possible. Continue current program of landfill disposal for grit and screenings.
NO PROJECT ALTERNATIVE (1989 Strategic Plan)	Similar collection projects to those of .	Produce a blend of 50 percent primary and 50 percent secondary effluent for ocean discharge (scenarios 5 and 6).	Continue existing reuse programs: GAP and Talbert saltwater intrusion barrier.	Construct and use a new 120-inch outfall.	Use existing 120-inch outfall. Construct a new, second 120-inch outfall.	Continue beneficial reuse (land application) of biosolids to the extent possible. Continue landfill disposal for grit and screenings.
	Construct Super Sewers: Super Bushard Super SARI Super Newhope Super Euclid Construct upstream storage facilities	Produce 100 percent, full secondary effluent for ocean discharge (Scenarios 3 and 4)	Do not implement GWR System.	Increase wastewater influent reductions through increased conservation and I/I flow reduction. Increase storage at the WWTPs. (See also Collection System alternatives and Disposal alternatives, which contribute to peak wet weather management)	Construct a new, 120-inch outfall Construct a parallel, 15,000-foot barrel to the existing 120-inch outfall that connects to the diffuser section. Discharge to the Santa Ana River for peak wet weather emergency discharge.	Disposal of all biosolids in a landfill.

Much of the analysis in this report considers the No Project Alternatives to be bracketed by the Full Secondary and the NPDES Permit Compliance alternatives, falling in between the four other treatment alternatives with respect to required secondary treatment facilities. For purposes of analyzing land-side impacts under CEQA, Scenarios 1 and 2 together constitute the minimum number of proposed additional facilities whereas Scenarios 3 and 4 require the maximum capital improvement effort. However, there would be large differences between Scenarios 5 and 6. Scenario 6 would require additional secondary treatment facilities to accommodate 100 mgd for GWR System while still providing secondary treatment for 50 percent of the remaining effluent discharge. As highlighted in Figure S-5, resources necessary for Scenario 6 would closer to the full secondary scenarios while Scenario 5 would be closer to the NPDES permit scenarios.

9.5 ALTERNATIVES ANALYSIS FOR KEY PROJECT IMPACTS

The characteristics and environmental impact trade-offs for the six alternative treatment scenarios are reviewed in Chapter 10.0 of this EIR, Cross-Media Environmental Trade-offs. The alternatives have differing levels of effect on the marine environment, air quality, and land resources. This discussion focuses specifically on the key significant impacts identified for the Preferred Alternative (Scenario 2) and how the alternatives compare in terms of impact.

EFFLUENT WATER QUALITY / MARINE ENVIRONMENT

The EIR evaluates six level of treatment / effluent quality scenarios. The District would comply with the effluent discharge requirements specified in its current NPDES permit under all six scenarios. Tables 5-26 and 5-27 in Chapter 5.0 compare the projected effluent quality under each of the six alternatives in terms of concentration and mass load, respectively. Figures 5-7 and 5-8 illustrate the type and percentage of primary and secondary treatment effluent would receive under each alternative scenario by the year 2020.

Full secondary treatment Scenarios 3 and 4 provide 100 percent secondary effluent for ocean discharge. Scenarios 5 and 6 provide for a constant 50 percent secondary blend for the ocean discharge. Scenario 2, the Preferred Alternative, provides the least amount of secondary treated effluent for ocean disposal. Table 5-30 in Chapter 5.0 summarizes the projected water quality and marine environment impacts under each of the six alternatives. The key findings between the alternatives as compared to current conditions are summarized below for year 2020 projections.

- For many measures of water quality, sediment quality and biota health, the six alternatives would not result in significant changes over present day conditions.
- Total suspended solids (TSS) would increase 10 to 13 percent under Scenarios 1, 2, and 5, compared to current levels which would slightly increase potential for out-of-compliance events. TSS mass load to the ocean would decrease 40-55 percent under full secondary treatment scenarios 3 and 4, improving compliance. Under Scenario 6, 50:50 effluent blend plus GWR System, TSS would decrease up to 18 percent.

- Floating Particles / Oil and Grease mass load would increase up to 42 percent under Scenarios 1 and 2, up to 35 percent with Scenario 5, and only 2 percent with Scenario 6. Under Scenarios 1, 2, and 5 oil and grease mass load and concentration would comply with established permit limits, but there is increased potential for non-compliance events of the narrative standard that prohibits increase in observable floating particles.

- Metals loading would increase about 0 to 14 percent under Scenarios 3, and 4; about 30 percent under Scenarios 1 and 5; and up to 66 percent under Scenario 2. However there would be no degradation of the benthic organisms or indigenous population under any of the six scenarios.

- Effluent toxicity is not expected to be significant under any of treatment scenarios, but implementation of the GWR System project under Scenarios 2, 4, and 6 would contribute concentrated brine to the effluent and could affect toxicity impacts on marine organisms. Additional analysis of the effect of brine disposal on effluent toxicity is required. To maintain compliance with toxicity limits the District may need to implement measures to reduce concentrations such as dilution, flow equalization, additional treatment, or alternative disposal. The other three alternative scenarios (Scenarios 1, 3, and 5) do not include implementation of the GWR System project. Although OCSD would continue to receive some brine discharges from ongoing regional desalting projects, it would not receive the substantial brine increase generated by the GWR System project under these other alternatives. Thus, these non-GWR System alternatives would reduce the potential toxicity effect associated with brine disposal under the preferred project alternative.

Of all the alternatives, Scenarios 3 and 4 would provide the highest level of effluent quality to the ocean. However, as discussed in Chapter 10, these scenarios have great impact in the areas of air quality and land resource use. All of the alternatives, including the Preferred Alternative, would comply with the District's current NPDES permit, so it is not necessary for the District to consider an alternative to its preferred program in order to achieve this compliance.

PEAK WET WEATHER MANAGEMENT - USE OF THE 78-INCH OUTFALL / BEACH CLOSURE

Under the Preferred Alternative, the District will implement several measures to manage peak wet weather flows to insure proper treatment and disposal for these high volume flows (See Table 9-1). As part of the program, the existing 78-inch outfall would be used infrequently to help handle brief periods of very high flows that occur as a result of very large rainstorm events. The existing 78-inch outfall has not been used, even for an emergency, since 1971 when the 120-inch deepwater outfall became operational. Based on a computer model used to predict the statistical probability of peak flow events in the future, by the year 2020 the 78-inch outfall would be used about once every three years to discharge treated effluent during peak wet weather events for a period of one to several hours. Use of the 78-inch would require short-term closure of the local beaches to body-contact recreation activities (swimming and surfing), due to the potential for elevated levels of pathogens to reach the beach zone waters and pose a potential public health concern.

The infrequent, short-term but still significant and unavoidable impact to recreation users of beach closure would be the same under any of the six treatment level alternatives. Although the alternative treatment scenarios would provide a higher level of secondary effluent for discharge compared to the Preferred Alternative (Scenario 2), temporary beach closure would be required under any effluent discharge.

Several alternatives for reducing and managing peak wet weather flows were evaluated in the Strategic Plan and presented in Volume 3 (See Figures 9-1 and 9-2, above). Alternatives to use of the 78-inch outfall considered that might be able to avoid this significant project impact include are reviewed below.

The District actively solicited input from the community during its review and selection of the preferred program to manage peak wet weather flows. The District established the Planning Advisory Committee (PAC) after recruiting 1,600 potential participants and inviting all 30 respondents that expressed interest to participate on the committee. The objectives of the workshop process were:

- To inform the stakeholders about the peak flow management challenges facing OCSD;
- To discuss the project components and the methodology with which the technically feasible alternatives were developed;
- To present, discuss, and evaluate the alternatives;
- To introduce and facilitate the decisions modeling process; and
- To form a recommendation for consideration but the Board of Directors for the peak flow management strategy.

The District then hosted 6 workshops with the PAC to present information and gain input and direction on their concerns and preferences. The results of the PAC evaluation are presented in Volume 3, Chapter 8 of the Strategic Plan. The PAC considered several evaluation criteria, the frequency of peak wet weather events exceeding the capacity of the existing 120-inch outfall and necessitating discharge through another location such as the 78-inch was a key concern. The majority of the PAC committee members supported either the Preferred Alternative or a similar program that would also include construction of additional storage facilities at the treatment plants to further reduce use of the 78-inch outfall.

NEW 120-INCH DEEPWATER OUTFALL

Installation and use of a new, second deepwater outfall would eliminate the need for use of the 78-inch outfall during peak wet-weather events and avoid the need for beach closure. As with the existing 120-inch outfall, discharge of effluent through a new deepwater outfall would not adversely affect nearshore waters that support beneficial recreation uses. Construction of a new outfall is part of the potential No Project Alternative as this was considered as part of the recommended long-term program in the adopted 1989 Master Plan.

Although detailed siting studies for a new outfall have not been conducted, a general program-level analysis of impacts is presented in Chapter 5.0 of this EIR. Installation of a new outfall would cause potentially significant but temporary disruption to marine communities along the outfall alignment. Eventually, organisms would recolonize the disturbed construction zone and the new outfall structure would provide substantial new artificial reef habitat, increasing the habitat diversity in the area. Based on the assumption that the new outfall diffuser would be located away from the existing diffuser area and its zone of initial dilution, the impacts of effluent discharge through both the existing 120-inch and new 120-inch outfall would be less than significant.

As shown in Figure 9-2, the new outfall alternative (alternatives 4a1 and 4b1 in the figure) is the second most expensive option and the capital cost is about 17 percent more than the Preferred Alternative. A new, second deepwater outfall would substantially increase the District's average dry-weather discharge capacity as well as peak wet weather discharge capacity. With a new, second outfall the District would have discharge capacity well beyond the projected needs in year 2020. The new 120-inch would create significant additional capacity, which for peak wet-weather management would only be needed an estimated once every three by the year 2020. In considering this alternative approach for addressing peak wet-weather flows, the District Board of Directors must weigh the impacts of constructing a new deep water outfall five miles into the ocean, the potential growth inducing impacts of providing significant additional average dry weather flow disposal capacity far in advance of projected need, and the cost of this facility to current rate payers against the infrequent but significant impact of closing local beaches possibly once every three years during high intensity rainfall events.

SANTA ANA RIVER

The Strategic Plan also evaluated potential use of the existing emergency discharge point the District has to the Santa Ana River. Designated for use only in extreme emergencies, this discharge point has never been used by the District. As shown in Figure 9-2, the Strategic Plan analysis indicated that it would be possible to avoid discharge to the 78-inch outfall if the Santa Ana River discharge point were used instead in combination with other measures (see alternatives 2a1, 2a2, and 2b1 in the figure). However, discharge to the Santa Ana River would also result in closure of local beaches because the treatment plant would discharge effluent to the river near the mouth where it discharges to the nearshore ocean environment, posing the same if not more of a public health concern than the 78-inch discharge. Therefore, this alternative would have the same impact or worse than the Preferred Alternative. It should be noted that the water in the Santa Ana River during wet weather events is often poor quality due to runoff of non-point source pollution from urban and agricultural/dairy areas. The water quality of the Santa Ana River alone, without the peak wet weather discharge from the District's plant, already has pathogen levels that exceed public health standards and warrant beach closure. Nonetheless, infrequent discharge of treated wet weather effluent would require beach closure.

15,000-FOOT PARALLEL BARREL FOR 120-INCH OUTFALL

The Strategic Plan considered installing a 15,000-foot long barrel storage facility running parallel to the 120-inch diameter outfall on the ocean floor to serve as storage capacity, reducing the risk of overloading the outfall's discharge capacity during peak flow events. The 1,000-foot diffuser at the end of the outfall could suffer damage from over-loads created by the lack of adequate upstream equalization storage. The Strategic Plan calculated that the barrel could provide an additional 150 mgd discharge capacity, bringing the total capacity of the 120-inch outfall up to 633 mgd. However, the subsequent determination that peak flow rates of up to 775 mgd could be anticipated eliminated the effectiveness of the 15,000-foot barrel. The idea was eliminated from further consideration as a result.

OFF-SITE STORAGE

The Strategic Plan analyzed the potential of placing storage tanks upstream of the treatment plants out in the community connected to the collection system to store peak wet weather flows until the treatment plants had regained adequate capacity. Storage tank locations were considered for the upper reaches of the collection system. Potential storage facilities upstream in the trunk sewer system would help to mitigate downstream peaks and provide the potential benefit of reducing the capacity needed for peak wet weather disposal. However, it is impossible to predict where in the trunk sewer system the storage would be needed and very expensive and with significant impact to construct adequate storage on each trunk system throughout the District. Therefore, off-site storage was considered as an alternative to addressing collection system capacity deficiencies but not as a viable alternative to prevent flow exceedance events triggering the need for use of the 78-inch outfall.

With respect to potential environmental impacts, the establishment of permanent storage tanks for raw sewage in locations remote from the District's headquarters and treatment facilities would create potential odor and safety issues for the community. In addition, these tank facilities would have land use impacts, competing for flat developable land within the developed service area and possible visual impacts. Further, this alternative was the most expensive of the fourteen evaluated. Because of the potential impacts and cost, this idea was eliminated from further consideration early in the strategic planning process.

INCREASED STORAGE AT THE PLANTS

The District has already included in the Preferred Alternative maximizing the use of existing plant facilities to provide peak wet weather storage. Another alternative evaluated the addition of up to 40 mg of additional dedicated storage at the treatment plants. For example, the undeveloped northern end of Plant No. 2 has space available to construct 20-foot deep ponds over this 5 acre area and provide much of this storage capacity. Storage could be either open or covered facilities.

As shown in Figure 9-2 (alternative 3b2), construction of up to 40 mg of new storage facilities onsite would not alone eliminate the need for use of the 78-inch but in combination with construction of the 15,000 parallel outfall barrel could. Also, construction of such storage in addition to the would reduce the potential frequency of future discharges through the 78-inch outfall to once every five years or less (see alternative 1b3 in Figure 9-2).

Increased storage at the plants will be optimized, but several problems exist. Groundwater at both plants, but particularly at Treatment Plant No.2 is shallow. Underground basins to store storm runoff would require year-round dewatering which has proven, to this point, to be technically infeasible and prohibitively expensive. Above ground storage facilities pose potentially significant issues with neighboring communities involving aesthetics, odors, and public safety.

INCREASED CONSERVATION AND I/I FLOW REDUCTION

The Strategic Plan projections of future wastewater flow assume that the District and its members will achieve, through an aggressive program, a 13 mgd flow reduction through toilet retrofit conservation by the year 2020 and also achieve by 2020 up to a 20 percent reduction in inflow and infiltration volumes through various collection system rehabilitation programs particularly of manholes throughout the area. The District is pursuing a program to gain additional information about the nature and magnitude of the I/I flow contributions to the system. However, at this time, the District finds that it does not have sufficient information to indicate that it could reliably reduce I/I flow or increase conservation more than currently proposed and eliminate the need for use of the 78-inch outfall for some peak wet-weather discharges.

AIR EMISSIONS FROM PLANT CONSTRUCTION

As discussed in Impact 6.5-1, construction activities under any of the six treatment scenario alternatives would result in temporary but significant and unavoidable increases in PM10 (dust) emissions and other criteria pollutants (CO, NO_x, and ROC) due primarily to earthwork and construction equipment operation. Scenarios 3 and 4, which provide full secondary treatment for all effluent would involve construction of most facilities and therefore would generate the highest level of air emissions compared to the other alternatives. Scenarios 1 and 2 involve construction of the fewest additional facilities, relatively and therefore would generate the least additional air emissions (roughly 40 to 50 percent less than scenarios 3 and 4). Scenarios 5 and 6, which represent the No Project Alternative, would generate a level of construction air emissions between the high end of Scenarios 3 and 4 and the low end of Scenarios 1 and 2.

AIR EMISSIONS FROM INCREASED TRUCK TRIPS (MOBILE SOURCES) FOR PLANT OPERATION

As discussed in Impact 6.5-3, under any alternative scenario, the increase in mobile source (truck and vehicle) emissions associated with operation of the expanded treatment plants would result in

likely exceedance of the region's threshold for Nitrous Oxides (NOx). Thus, none of the alternatives would avoid this impact. Other criteria pollutant emission would also increase but are not projected to exceed the thresholds. Vehicle trips including chemical deliveries, residuals hauling, and employee commute trips would increase about 60 to 100 percent over current levels by 2020 under the alternatives. Because Scenario 2 generates less biosolids, there is less residuals hauling under this alternative and less air emissions compared to the other scenarios. In 2020 Scenario 4 would generate about 10 percent more vehicle traffic than Scenario 2. Criteria pollutant emissions from these mobile sources under Scenario 2 in 2020 would range from 80 to 90 percent of those projected for Scenario 4. Scenarios 5 and 6, representing the No Project Alternative, would generate emissions between the levels projected for Scenarios 2 and 4.

CONSTRUCTION NOISE AND VIBRATION DURING TREATMENT PLANT EXPANSION

As discussed in Impact 6.4-1, construction to expand the treatment facilities at the District's two plants under any of the six alternatives would result in temporary, but significant and unavoidable noise and vibration (pile driving) impacts to the residential neighbors located on some sides. Scenarios 3 and 4, which provide full secondary treatment for all effluent would involve construction of the most facilities and therefore would generate the greatest amount of construction noise and vibration compared to the other alternatives. Scenarios 1 and 2 involve construction of the fewest additional facilities, relatively and therefore would generate the least construction noise and vibration comparatively. Scenarios 5 and 6, which represent the No Project Alternative, would generate a level of construction noise and vibration between the high end of Scenarios 3 and 4 and the low end of Scenarios 1 and 2.

GROWTH INDUCEMENT AND SECONDARY EFFECTS OF GROWTH

All of the alternatives, including the No Project Alternative, would serve the same level of planned growth and development within the District's service area. The District's program under any of the alternatives is intended to match and adequately serve the growth planned and approved through the land use jurisdictions in the area (the cities and County). The local cities and the County have evaluated the effects of planned growth. Some of the secondary effects of planned growth were considered to be significant but mitigable and other significant unavoidable. The alternatives support the same level of growth and share the same potential secondary effects of growth as defined in the EIRs on the local General Plans.

CHAPTER 10

CROSS-MEDIA ENVIRONMENTAL TRADEOFFS

CHAPTER 10
CROSS-MEDIA ENVIRONMENTAL TRADEOFFS

INTRODUCTION

The Orange County Sanitation District (District) must consider cross-media tradeoffs when making public policy decisions regarding levels of treatment. Generally speaking, increasing the level of treatment to wastewater increases levels of waste or impacts to other media. For example, providing full secondary treatment under Treatment Scenario 4 would increase biosolids quantities, increase air emissions from truck traffic and energy production, and increase energy consumption. Land requirements for beneficial land applications and capital improvements for treatment and reuse facilities increase substantially with increasing levels of treatment. Total environmental management must take into account cross-media impacts, resource use, and overall minimization of health risks when evaluating the relative merits of wastewater treatment and disposal alternatives. The purpose of this section of the EIR is to compare the environmental tradeoffs between water, land, and air resources inherent in the treatment decisions that must be made.

The District currently receives about 255 mgd of wastewater and, by 2020, expects to receive about 352 mgd. This wastewater must be treated so that all aspects of its ultimate disposal and reuse protect public health and meet applicable environmental laws and regulations. Treated wastewater is discharged to the Pacific Ocean, with treatment by-products reused on land (e.g., biosolids to agriculture) and the air (e.g., volatilization of substances in wastewater and emissions from treatment equipment).

For illustration purposes, if untreated sewage were allowed to flow directly to the sea, the Pacific Ocean would receive all of the waste, the land would receive none, and the air would receive only those substances that volatilized during transport of the sewage that reaches the plants. In meeting water quality laws, the District must remove a substantial percentage of the solids and other materials contained in the sewage that reaches the plants. Chemicals must be added to facilitate this process, further increasing the quantity of solids to be reused on agricultural land. The pumping and aeration of the wastewater and the addition of chemicals allows the volatilization of small quantities of toxic gases dissolved in the wastewater. The treatment process also produces digester gases (primarily methane) that are used as a fuel source for driving engines or generators that convert the energy in the digester gases to electricity.

These cross-media tradeoffs are an important focus of the District's decision process because of increasing constraints on air emissions and land reuse of biosolids as well as ocean water quality. Any environmental benefits to the ocean of increased treatment must be weighed against the environmental costs associated with increased air emissions, increased biosolids quantities,

increased use of energy and other resources, and increased capital and operating costs. This analysis attempts to explain and quantify these factors, identify the tradeoffs, and provide a basis for the District to reach an informed decision on the degree of treatment to be implemented.

MARINE ENVIRONMENT

Treated wastewater is discharged to the Pacific Ocean through the 120-inch outfall and diffuser, located 4 miles off the Orange County coast at a depth of about 200 feet. Chapter 5, Ocean Discharge, of this report identifies the levels of measured contaminants in the wastewater effluent and estimates future levels under the six different Treatment Scenarios.

The impacts to the marine environment primarily affect the immediate vicinity of the outfall diffuser. Increased treatment may provide a slightly greater assurance that the marine effluent will not impair beneficial uses in the vicinity of the outfall diffuser. However, each of the Treatment Scenarios comply with state and federal regulations developed to provide adequate protection of the marine environment and beneficial uses. Chapter 5, Ocean Discharge, provides discussion on the impacts to the marine environment and public health associated with varying levels of treatment. Providing increased treatment to wastewater effluent has tradeoffs experienced by the land-side environment. The increased levels of treatment reducing total suspended solids (TSS) and biochemical oxygen demand (BOD) may not benefit the marine environment to warrant the land-side impacts. **Table 10-1** summarizes volumes of contaminants loading for Scenario 2 and 4 at 2020. The remainder of this Chapter will analyze the trade-off effects of increased levels of wastewater treatment to land, air, and energy resources.

LAND RESOURCES

Land resources are committed to or affected by the wastewater collection, treatment, reuse, and disposal process through a variety of actions. These commitments and uses include:

- Use of land for treatment plants,
- Use of land for wastewater residuals disposal
- Use of land for beneficial uses of biosolids

The 209 acres dedicated for wastewater treatment purposes at Plant Nos. 1 and 2 are sufficient to allow construction of any of the six scenarios. Scenario 2 would develop an additional 300,000 square feet for both plants combined. Scenario 4 would develop an additional 635,000 square feet for both plants combined. Although each scenario proposes different configurations of on-site development, it is not proposed to allow use of any portion of either site for purposes other than wastewater treatment, nor would wastewater facilities not involved with collection be placed off site (see **Figures 3-7, 3-10** and **3-11**, Chapter 3, Project Description). Increased levels of treatment would not impact land uses on either plant site.

TABLE 10-1
EFFLUENT QUALITY IN THE YEAR 2020
(lbs/day unless otherwise noted)

	Ocean Plan Scenario 2	Full Secondary Scenario 4	Difference
Total Suspended Solids	225,347	43,307	182,040
Oil and Grease	49,617	14,221	35,396
Ammonia	55,513	50,799	4,714
Metals			
Cadmium	4.64	1.56	3.08
Chromium	14.88	9.29	5.59
Copper	106.06	49.93	56.13
Lead	7.8	5.9	1.9
Nickel	70	65.7	4.3
Silver	7.2	4.0	3.2
Zinc	112	124.3	0
Viruses and Indicator Bacteria			
Total coliform MPN/100 ml	$1.8x10^7$	$4.2x10^6$	$13.8 x10^6$
Fecal coliform MPN/100 ml	$6.4x10^6$	$1.5x10^6$	$4.9 x10^6$
Virus, PFU/10 ml	0.23	0.03	0.2

BIOSOLIDS LAND APPLICATION

As discussed in Chapter 8, Biosolids, increasing treatment will increase biosolids volume due to additional settling of suspended solids within secondary clarifiers. **Table 10-2** summarizes the increase in biosolids volumes and acreage necessary for beneficial land application at permitted agricultural sites. The reduction in total suspended solids (TSS) of the ocean effluent from full secondary treatment would increase biosolids volume significantly. This increase would in turn create the need for approximately 1,700 more acres of agricultural land per year for beneficial land applications.

TABLE 10-2
BIOSOLIDS VOLUMES AND LAND APPLICATION ACREAGE

	Volume (1,000 wet tons per year)			Land Needed for Agricultural Application (Acres per year)		
	Ocean Plan Scenario 2	Full Secondary Scenario 4	Difference	Ocean Plan Scenario 2	Full Secondary Scenario 4	Difference
2005	264	325	61	5,300	6,900	1,600
2020	342	421	79	6,800	8,500	1,700

SOURCE: OCSD, Strategic Plan, Volume 8

If beneficial land applications become scarce in the future due to local or state regulations, the District may have to return to disposing of biosolids in landfills. If this situation were to occur, increasing treatment levels for the benefit of the marine environment would create the need for an additional 20,000 cubic yards of landfill space-per-year in 2020. **Table 10-3** converts the wet tons-per-year to cubic yards to estimate solid waste disposal quantities.

TABLE 10-3
BIOSOLIDS VOLUME DRY (1,000 cubic yards per year)

	Ocean Plan Scenario 2	Full Secondary Scenario 4	Difference
2005	66	81	15
2020	85	105	20

BIOSOLIDS QUALITY

Increasing wastewater treatment would increase levels of metals, chlorinated organic compounds, and perhaps other contaminants in biosolids. Actual differences are highly dependant upon digestion which converts or significantly reduces volatile organics, pathogens, and oil and grease. The small quantified differences in contaminants between scenarios do not suggest any compelling biosolid-quality reasons for selecting one alternative over any others at this time. Future biosolids quality will depend heavily on source reduction and innovative solids treatment processes being researched by the District. The small increase in contaminants removed from the wastewater effluent under the full secondary treatment scenarios is not anticipated to affect biosolids management options.

AIR RESOURCES

Air emissions released during wastewater collection, treatment, and disposal include the following:

- Volatilization of substances from wastewater
- Vehicle exhaust emissions from chemical delivery trucks, biosolids hauling trucks, employee vehicles, maintenance vehicles, construction vehicles, and visitor vehicles
- Emissions from the central generation system, boilers, and flares
- Volatilization of substances from biosolids
- Emissions from paints and solvents

Volatile organic compounds, particulate materials, and inorganic substances contained within the waste stream are released into the air during each phase of the treatment process including the solids handling process. Some of these compounds are considered toxic.

The District monitors many categories of air emissions, including reactive organics, nitrogen oxides, sulfur oxides, carbon monoxide, methane, ammonia, hydrogen sulfide, chlorinated organics, toxic metals, and aromatic organics. These emissions are reported to the SCAQMD. Detailed estimates of these pollutants were developed for most emission sources for evaluation of impacts on air quality.

Increased levels of treatment require more fuel consumption and therefore more air emissions, creating a tradeoff impact. Management decisions must take into account the severity of the tradeoff, assessing impacts to the air basin compared to the ocean water quality benefits. The calculated difference in air emissions between treatment scenarios provides a quantified measurement of this tradeoff.

CRITERIA POLLUTANTS

Criteria pollutant emission sources from wastewater treatment operations include exhaust emissions from the central generation system, emissions associated with off-site energy generation, and vehicle exhaust emissions from biosolids haul trucks, chemical haul trucks, grit and screening haul trucks, and employee commutes. **Table 10-4** illustrates the differences from mobile source emissions for Scenarios 2 and 4. **Table 10-5** summarizes criteria pollutant emissions from the central generation system (CGS) for the 1997/98 fiscal year as well as current permit limits. Assuming that secondary treatment currently consumes approximately 20-30 percent of the total energy usage provided by the CGS, full secondary treatment under Scenario 4 would increase CGS air emissions from current levels by approximately 30-45 percent. Scenario 4, while providing increased treatment for the ocean effluent, would slightly increase criteria pollutant emissions to the South Coast Air Basin.

TABLE 10.-4
ESTIMATED CRITERIA POLLUTANT EMISSIONS
FROM MOBILE SOURCES (lbs/day)

	Scenario 2		Scenario 4	
	1998	2020	1998	2020
CO	302.92	301.48	336.22	352.90
ROC*	32.00	32.62	36.21	39.57
NO_x	108.17	156.43	123.64	190.92
SO_x	2.32	4.19	2.50	4.64
PM_{10}	6.11	6.64	7.06	8.15

*Reactive Organic Compounds

TABLE 10-5
CRITERIA POLLUTANTS EMISSIONS FROM CENTRAL GENERATION SYSTEM FOR FISCAL YEARS 1997-1998

	Emissions in lbs/day				
	CO	TGNMO*	NO_x	SO_x	PM_{10}
Fiscal Year 1997/98					
Plant No. 1	627	220	242	10	10
Plant No. 2	1,649	256	411	13	30
Permit Limits					
Plant No. 1	1,102	276	368	36	14
Plant No. 2	2,644	372	828	84	32

* permit limits are expressed as total non-methane hydrocarbons
SOURCE: OCSD, *1998 Annual Report: Operations & Maintenance*, 1998.,
OCSD Strategic Plan, Volume 4 Section 11.

TOXIC EMISSIONS

Air toxics emissions detected from wastewater treatment include toluene, xylene, ammonia, chloroform, perchloroethylene, trichloroethylene, and formaldehyde. Increasing treatment levels will increase air toxics and volatile organic compounds (VOC) emissions slightly due to prolonged aeration. In addition, air toxics would be anticipated to increase proportionally with influent gallons per day. Increased energy production will also increase air toxics emissions from the CGS exhaust. Assuming that emissions control equipment stays the same under each Scenario, Scenario 4 will increase air toxics emissions due to prolonged aeration and increased CGS emissions. Increased air toxics emissions could trigger a review of the District's risk assessment for neighboring communities.

FUGITIVE EMISSIONS

Fugitive air emissions from wastewater and residuals have not been quantified. Accurate sampling of these substances is extremely difficult, and no accurate predictive methods are known. The differences in magnitude of total emissions between scenarios will be a function of total volatile substances dissolved in the wastewater and the percentage of the substances that will actually volatilize. Fugitive emissions include volatile organics as well as particulate matter from dust generation and solids handling. Fugitive emissions would be expected to increase with increased flow and with increased secondary treatment. However, the small quantified differences in fugitive emissions between scenarios do not suggest any compelling reasons for selecting one alternative over any others at this time.

RESOURCE ALLOCATION

ENERGY RESOURCES

Finite resources in addition to land must be allocated to wastewater collection, treatment, and disposal. Energy may be considered the most important of these resources because of the secondary environmental impacts associated with energy production, the limited energy resources available, and the dependence of the United States on imported energy. **Table 10-6** summarizes energy consumption for the different scenarios. Full secondary treatment uses a significant amount of energy in relation to other treatment scenarios. Energy sources used by the District are non-renewable since at this time the central generation system can not be upgraded due to air emissions restrictions. The increased energy consumption required by higher levels of effluent treatment poses a significant difference between allocation of resources.

TABLE 10-6
PROJECTED ENERGY NEEDS FOR RECLAMATION PLANT NO. 1 AND TREATMENT PLANT NO. 2 (KW)

	2005		2020	
	Scenario 2	**Scenario 4**	**Scenario 2**	**Scenario 4**
Plant 1	5,462	5,667	7,044	8,252
Plant 2	8,427	13,744	10,145	15,196
Total	13,889	19,410	17,189	23,448

Source: OCSD, Strategic Plan, Vol. 4 Section 12

GROUNDWATER REPLENISHMENT SYSTEM

In addition to energy resources, reclamation efforts will be impacted by the different treatment scenarios since three of the six scenarios include participation in the Groundwater Replenishment (GWR) System with the Orange County Water District. Chapter 3, Project Description, provides a description of the GWR System including input water quality requirements and output brine quality. Brine, produced as a byproduct of tertiary treatment, would be added to the ocean effluent, potentially affecting effluent quality. Implementation of the GWR System would constitute a clear trade-off of resources. The program would provide tertiary treatment plus additional micro-filtration for water slated to recharge groundwater basins, while increasing the amount of water receiving only advanced primary treatment for discharge to the ocean. The project would provide significant benefits to the groundwater basin within Orange County. The beneficial tradeoffs for slightly decreasing ocean effluent water quality are substantial, including protection of a drinking water source through reclamation.

TRADEOFFS SUMMARY

In weighing the environmental tradeoffs of alternative wastewater treatment levels, the primary differences in impacts focus on:

- Marine impacts,
- Biosolids management,
- Energy consumption,
- Air impacts,
- Water Reclamation.

The tradeoffs evaluation provides important input to the decision as to whether the additional biosolids management, air quality, and energy consumption with higher treatment levels will achieve sufficient marine environment benefits to justify these resource commitments. Chapter 9, Alternatives Analysis provides comparisons of the treatment scenarios.

The Preferred Alternative would consume less energy and emit slightly less air pollution from both mobile and stationary sources than the full secondary scenarios. Fewer biosolids would be produced, which in turn would require 1,700 fewer acres per year for land applications. The GWR System would provide significant water conservation benefits. The beneficial impacts to the marine environment from the implementation of the full secondary scenarios include reduced TSS and BOD mass emissions. Other toxicants are also reduced, benefiting marine life habitats.

REFERENCE - CROSS MEDIA ENVIRONMENTAL TRADE-OFFS

Orange County Sanitation District, *Strategic Plan*, 1999.

Orange County Sanitation District, *Master Plan EIR*, 1989.

CHAPTER 11

GROWTH INDUCEMENT / SECONDARY EFFECTS OF GROWTH

11 GROWTH INDUCEMENT AND SECONDARY EFFECTS OF GROWTH

INTRODUCTION

The California Environmental Quality Act (CEQA) Guidelines (Section 15126(D)) require that an Environmental Impact Report (EIR) evaluate the growth inducing impacts of a proposed action. A growth inducing impact is defined by the CEQA Guidelines as:

> The way in which a proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this definition are public works projects which would remove obstacles to population growth. It is not assumed that growth in an area is necessarily beneficial, detrimental, or of little significance to the environment.

A project can have direct and/or indirect growth inducement potential. Direct growth would result if a project involved construction of new housing. A project can have indirect growth inducement if it would establish substantial new permanent employment opportunities (e.g., commercial, industrial or governmental enterprises) or even if it would involve a substantial construction effort with substantial short-term employment opportunities and indirectly stimulate the need for additional housing and services to support the new employment demand. Similarly, a project would have an indirect growth inducement effect if it would remove an obstacle to additional growth and development, such as removing a constraint on a required public service.

Wastewater treatment service is one of the chief public services needed to support urban development. The Orange County Sanitation District's Strategic Plan would increase the wastewater treatment capacity to serve the additional urban growth that is planned and anticipated to occur within its service area. The District's expansion of its wastewater treatment system would remove one obstacle to further urban development and population growth in northern Orange County. In accordance with CEQA definition, implementation of the Strategic Plan would be indirectly growth-inducing. As indicated in the CEQA definition above, growth inducement itself is not necessarily an impact.

The CEQA Guidelines further explain that the environmental effects of induced growth are considered indirect impacts of the proposed action. These indirect impacts or secondary effects of growth may result in significant, adverse impacts. Potential secondary effects of growth include: increased demand on other community and public services and infrastructure, increased traffic and noise, and adverse environmental impacts such as degradation of air and water quality, degradation or loss of plant and animal habitats, and conversion of agricultural and open space land to developed uses.

Growth inducement may constitute an adverse impact if the growth is not consistent with the land use plans and growth management plans and policies for the area affected. Local land use plans provide for land use development patterns and growth policies that allow for the orderly expansion of urban development supported by adequate urban public services, such as water supply, roadway infrastructure, sewer service and solid waste service. A project that would induce "disorderly" growth, in conflict with the local land use plans could indirectly cause additional adverse environmental impacts and impacts to other public services. Thus, to assess whether a growth-inducing project will result in adverse secondary effects, it is important to assess the degree to which the growth accommodated by a project would or would not be consistent with applicable land use plans.

RELATIONSHIP TO REGIONAL GROWTH

The District provides wastewater treatment capacity to serve total population growth in the service area. Without adequate wastewater treatment capacity, population growth could be constrained. Therefore, the District's actions have an influence on regional growth.

Due to the urban density within the service area, individualized septic systems are not an option for local planning agencies. Municipalities and local industries must discharge wastewater to the District's existing collection system in lieu of obtaining individual wastewater discharge permits from the Regional Water Quality Control Board (RWQCB). The Strategic Plan for expansion and improvement of the District's system has been designed to accommodate land use development and growth in accordance with the adopted general plans for the land use jurisdictions (23 cities and Orange County) within its service area. The local jurisdictions regulate land use, growth, and the location of development; land use decisions do not lie within the authority of the District. In this sense, the expansion of the sewage treatment system represents an accommodation to growth. Appendix B, Map B-1 provides future land use designations compiled from general plans of each city in the Service Area.

The local jurisdictions regulate land use planning through adoption of general plans, zoning regulations, and pertinent amendments. City councils for the 23 cities in the Service Area, in conjunction with the Orange County Board of Supervisors, have final approval over land use decisions. In addition, while wastewater collection, treatment, and disposal services may be provided by the District to levels set in general plans, local jurisdictions may change their plans independent of the District. It is possible that the local jurisdictions could rezone and amend their currently adopted general plans and thereby influence higher or lower levels of growth. The District could then implement its staged expansion on a faster or slower basis to accommodate the actual levels of growth.

Should the District's planned improvements not be made and the plant capacity not be increased, the treatment capacity of the existing facilities would be exceeded within the next few years. If wastewater treatment capacity is not increased as needed, it is possible that sewer connection permits would be withheld from newly proposed development, and that the District could be in violation of wastewater discharge requirements.

POPULATION PROJECTIONS

In the attempt to provide the appropriate level of service, commensurate with local planing policies and projections, the District calculated projections of wastewater influent from the Service Area based both on current estimates of land use changes and on new population growth projections. Ultimate flow projections were calculated using land use information gathered from area city general plans. Per capita flow rates to 2020 were calculated using Service Area population projections and historic water usage trends.

The Center for Demographic Research at the California State University in Fullerton (CDR), provided the District with population estimates to 2020. The population for the Service Area is projected to be 2,421,479, not including the City of Irvine, and 2,859,331 including Irvine. The CDR is the authority on demographic information for Orange County. The Southern California Association of Governments (SCAG) receives their population projection data from CDR for Orange County, and these same projections, in turn, are used in the 1997 Regional Air Quality Management Plan (AQMP) to project impacts on the local air basin. The CDR develops projections for Orange County to provide local jurisdictions with a consistent set of county-wide projections for use in operational planning. In 1996, CDR released a report entitled, "Orange County Projections 1996" (OCP-96-modified) for public use.

In order to tailor these projections to the Service Area, the District contracted with CDR to compile population and demographic information specific to the District's Service Area. The data are arranged by revenue area boundaries, city boundaries, sewersheds and census tracts. CDR provided the District with population forecasts in five year increments to 2020 and employment and housing projections within the same five year "projection horizons." **Table 11-1** reproduces the Center for Demographic Research population projections.

WASTEWATER FLOW PROJECTIONS

Wastewater flow projections used in the strategic planning analysis were calculated based on unit flow coefficient of gallons per capita per day (gpcd) usage. The unit flow coefficient is calculated by dividing OCSD's total average annual flow rate for a given year by the estimated population for that year. The average flow rate is defined as the flow into the plant headworks. Therefore the coefficient includes not only residential flows, but also commercial and industrial contributions. The unit flow coefficients from 1986 to 1990 remained relatively constant at 130 gpcd. The 1989 Master Plan based its flow projections to 2020 on a calculated coefficient of 132 gpcd. However, in 1991, the coefficient dropped significantly to 110 gpcd due to the effects of a prolonged drought and water conservation efforts. Since the end of the drought, per capita water usage has increased 6 percent and it is anticipated that wastewater flows will increase similarly.

TABLE 11-1
SERVICE AREA POPULATION DATA BY THE CENTER FOR DEMOGRAPHIC RESEARCH

	1995	2000	2005	2010	2015	2020
Revenue Area 1	225,590	228,965	232,261	236,644	240,459	245,820
Revenue Area 2	617,359	656,434	682,331	704,885	716,115	726,988
Revenue Area 3	716,564	749,953	769,460	788,549	804,653	816,885
Revenue Area 5	52,117	61,119	62,582	65,552	65,479	65,971
Revenue Area 6	107,389	111,470	111,956	112,088	111,415	113,494
Revenue Area 7	158,790	169,146	183,951	188,327	191,352	193,825
Revenue Area 11	117,983	128,774	132,103	133,718	133,685	133,958
Revenue Area 13	28,519	46,072	70,601	83,222	91,780	100,495
Unincorporated Areas (1)	11,369	13,234	14,956	16,086	15,955	15,716
Unincorporated Areas (2)	0	1,537	3,228	4,889	6,573	8,327
Subtotal	**2,035,680**	**2,166,704**	**2,263,429**	**2,333,960**	**2,377,466**	**2,421,479**
Irvine	220,517	258,056	294,173	315,364	334,890	370,716
Irvine Lake	9,548	25,119	37,590	47,134	55,846	67,136
Total	**2,265,745**	**2,449,879**	**2,595,192**	**2,696,458**	**2,768,202**	**2,859,331**

Source: OCSD, Strategic Plan, Volume 3, Section 2

Based on a this trend analysis, a unit coefficient between 132 and 110 gpcd was proposed. The 1999 Strategic Plan estimates the amount of wastewater generated per person in the year 2020 to be 125 gpcd. Improvements to the wastewater collection system are expected to further reduce flows by reducing the infiltration and inflow (I/I) of rain water and groundwater to the sewer system through cracks in the pipes and manholes.

Based on the revised average volume of wastewater generated per capita, and the updated population projections for the service area, including the City of Irvine, the projected average annual daily flow (ADAF) for the year 2020 as projected in the Strategic Plan is 352 mgd. This number includes the contractual agreements with Irvine and Santa Ana Watershed Project Authority (SAWPA) as well as the anticipated 13 mgd reduction from water conservation efforts. The 1989 Master Plan projected 399 mgd. The current wastewater flow projections are reduced approximately 10 percent from those considered in the 1989 Master Plan. **Table 11-2** summarizes the projected influent volumes.

TABLE 11-2
SUMMARY OF POPULATION-BASED INFLUENT PROJECTIONS THROUGH 2020 PROJECTED ANNUAL AVERAGE FLOW (MGD)

	2000	2005	2010	2015	2020	Ultimate
OCSD and other point sources	252	276	276	297	303	433
IRWD	10	15	21	26	32	32
SAWPA	13	18	23	29	30	30
Total	**275**	**309**	**336**	**351**	**365**	**495**
Projected conservation	3	6	8	11	13	23
Total with conservation	**272**	**303**	**328**	**340**	**352**	**472**
1989 Master Plan Projections	**318**	**340**	**363**	**381**	**399**	**--**

Although the Irvine Ranch Water District (IRWD) is projected to contribute 32 mgd by the year 2020. This influent to the OCSD system will primarily occur in the winter months when the IRWD reclamation projects experience reduced demand. OCSD does not provide the City of Irvine with wastewater treatment for the bulk of its flow, but rather is under agreement to accept excess wastewater in times when IRWD capacity is exceeded. IRWD currently contributes approximately 8 mgd to the OCSD system.

The Strategic Plan includes an ultimate influent flow projection for the District's service area reflecting ultimate build-out of the region. Ultimate flow rates were calculated using land use projections gathered from area city general plans.

THE GROWTH INDUCEMENT POTENTIAL OF THE STRATEGIC PLAN

The 1999 Strategic Plan provides wastewater flow estimates and subsequent capital improvement requirements based on an influent volume projection 10 percent lower than that projected in the 1989 Master Plan. Although population growth rates have remained consistent for the region, conservation measures have reduced rates of wastewater generation, thereby giving the District some flexibility with its planning efforts. In many respects, the new planning scenarios have reduced the capital improvement requirements to the year 2020. **Table 11-3** summarizes the projected capacity requirements for primary and secondary facilities from the 1989 Master Plan and in comparison to the 1999 Strategic Plan. Equipment capacity requirements for the 1999 Strategic Plan full secondary treatment scenarios are less than for those proposed in 1989. Similarly, the Preferred Alternative, Ocean Plan Scenario 2 of the 1999 Strategic Plan would

TABLE 11-3
CAPACITY PROJECTIONS FOR THE YEAR 2020

	1989 Master Plan Treatment Scenario Capacity Projections						1999 Strategic Plan Treatment Scenario Capacity Projections			
	Ocean Plan Limit		50:50		Full Secondary		Ocean Plan Limit (Scenario 2)		Full Secondary (Scenario 4)	
Level of Treatment	P1	P2	P1	P2	P1	P2	P1	P2	P1	P2
Advanced Primary (mgd)	262	270	262	270	262	270	268	172	268	172
Total (mgd)	**532**		**532**		**532**		**440**		**440**	
Secondary (mgd)	46	80	160	90	240	240	155	73	286	170
Total (mgd)	**136**		**250**		**480**		**228***		**456**	

P1 = Reclamation Plant No.1
P2 = Treatment Plant No. 2
*Existing capacity. No new capacity is proposed.

SOURCE: Environmental Science Associates, 1999; OCSD, 1989 Master Plan EIR; OCSD, Strategic Plan, Vol. 4, Part 2, Chapter 16, Table 16-6

One of the District's objectives in implementing the Strategic Plan is to adjust service capacity to accommodate projected demand rather than to get into a position where lack of system capacity is an obstacle to growth. Since the projected demand is currently less than that projected in the 1989 Master Plan, the capital improvements proposed to accommodate the projected capacity in 2020 are reduced as a result. Federal regulations concerning Publicly Owned Wastewater Treatment (POTW) facilities suggest that phased capital improvements should correspond to demand (40 CFR, Part 51, Subpart W). Since capital improvements for POTWs require significant planning and investment, actual capacity is added in large steps rather than in smooth correlation to actual growth, creating periods of excess capacity until demand catches up.

The District has jurisdiction and service responsibility for sewer service. If necessary capacity improvements were not implemented and wastewater influent exceeded treatment capacity, the District could violate effluent quality limitations of its discharge permit or threaten public health. The District can mitigate impacts to sewer service by providing the necessary facilities and services such that planned growth is not constrained nor environmental or public health threatened by inadequate service. The District can also minimize growth inducement potential by

providing service at the appropriate capacity, time and location to respond to and support approved development rather than stimulate it. To this end, the District is minimizing the growth-inducement potential by implementing the proposed phased Strategic Plan as a response to reduced flow projections.

REGIONAL MANAGEMENT PLANS

The SCAG Regional Comprehensive Plan and Guide (RCPG) completed in 1996 combines regional planning efforts into a single focused document. The RCPG supplants the 1989 Growth Management Plan (GMP) with respect to population, housing, and employment estimates for the six-county SCAG region. In addition to growth management, the RCPG addresses several core elements including transportation, air quality, water quality, and hazardous waste management. These elements provide a basis for regional conformity review for state regulations (as outlined in SCAG's Guidance for Implementation of the 1989 AQMP Conformity Procedures) and federal regulations (as promulgated in 40 CFR, Part 51, Subpart W). The RCPG also addresses as ancillary or advisory guidance the following elements: economic issues, housing, human resources, public finance, open space and conservation, water resources, energy resources, and integrated solid waste management.

The principal objectives of the RCPG are to coordinate regional and local decisions with respect to future growth and development and to minimize future environmental impacts. The 1996 updated RCPG uses population and demographic information (prepared by CDR for Orange County and published in the OCP-96-modified). This data has also been used for strategic planning analysis. The RCPG projects that additional growth in Orange County will continue to have significant and unavoidable adverse impacts, particularly with respect to air pollution. Growth will have significant impacts on transportation and some public services.

In 1998, SCAG prepared an Environmental Impact Report (EIR) on its Regional Transportation Program (RTP). The RTP acts as a long-term planning and management plan for the regional transportation system, providing mitigation measures to off-set the impacts of growth projected in the RCPG. The RTP EIR identifies significant unavoidable impacts to land use, noise, and socio-economics, but offers management plans perceived to be beneficial to air and transportation resources.

The Air Quality Management Plan (AQMP) updated in 1997 by the South Coast Air Quality Management District (SCAQMD) analyzes projected air quality impacts and provides mitigation measures to offset those impacts from projected growth outlined in the SCAG RCPG. The AQMP is a required part of SCAQMD's compliance with the federal Clean Air Act, although the U.S. EPA has not yet approved the plan.

Other public services in the area also plan for future growth based on regional growth projections provided by SCAG. Section 6.9, Public Services describes utilities and public services within Orange County including drinking water, energy, emergency services, and waste management.

Each of these entities conducts future planning efforts with respect to forecasted population growth.

The 1996 RCPG compiles information from local General Plans and forecasts. Ultimately, growth and growth accommodation is planned through local General Plans. State and federal regulations require wastewater treatment facilities to conform with regional planning efforts. With respect to air quality, local General Plans may not be in conformity with regional plans. To establish conformity with regional plans, wastewater treatment facilities must show that the rate of increase of service capacity corresponds to the projected rate of demand and does not facilitate unplanned growth.

IMPACTS AND MITIGATION MEASURES

Impact 11-1: By removing wastewater treatment capacity as one barrier to growth, the District would have indirect, growth-inducement potential to support planned development within the Service Area that is consistent with and within the levels of development approved in the adopted General Plans. Less the Significant with Mitigation Measures.

District-Proposed Mitigation

Measure 11-1a: The project's phased design helps minimize growth inducement potential. The Strategic Plan allows for the incremental expansion of treatment capacity, allowing Service Area cities to re-evaluate and revise long-term needs before completing full "build out."

Measure 11-1b: The District revises its Strategic Plan periodically allowing the treatment facilities to best meet the actual needs of the Service Area. The implementation of this Strategic Plan was based on a projected decrease influent flow and serves to decrease anticipated capacity requirements. Future revisions every five years will assist the District in maintaining service for reasonably foreseeable planned growth levels.

SECONDARY EFFECTS OF GROWTH

The growth-related impacts from the programmed wastewater treatment facility expansion would be indirect because they would result from the additional population growth accommodated by the project. Transportation, air quality, and public service impacts are the focus of growth-related impact analysis. Traffic congestion, air pollution and increasing demand for the provision of public services such as water supply, solid waste disposal, and electricity and gas are serious issues faced by residents of the District's Service Area, Orange County, and the entire SCAG region. Current levels of congestion and air pollution, coupled with potential shortfalls in supplies and service levels of critical public services, may continue to increase with additional population growth in Orange County and the entire SCAG region.

The growth-related impacts on transportation and air quality discussed here are based on the countywide impacts within Orange County rather than the OCSD Service Area because SCAG data are available only on the county-wide level. This approach is valid because the District's Service Area comprises the major populated portion of the county.

Chapter 4, Regional Setting of this document provides regional information for growth impacts assessments. The mitigation measures that would help to reduce impacts related to increased growth in the District's service area reside with other local jurisdictions that control land use (the 23 cities and Orange County), as well as state and federal agencies. Typically, the 23 cities and county would implement mitigation measures of a general nature when developing and approving their general plans and of a specific nature on a case-by-case basis during project approval. The following sections provide a summary of mitigation measures applicable to local jurisdictions and management agencies to reduce the secondary effects of projected growth.

TRANSPORTATION

The South Coast Association of Governments (SCAG) prepared the Regional Transportation Program (RTP) and EIR in 1998. The RTP includes measures to reduce impacts of projected growth on transportation and environmental resources in the Southern California region including air quality. The plan identifies significant unavoidable impacts to socio-economics, noise, and land use, but provides benefits to air quality and transportation. Cumulative impacts identified in the RTP EIR, including the general degradation of mobility due to an overall increase in congestion from population growth, are also considered significant and unavoidable.

AIR QUALITY

The South Coast Air Quality Management District (SCAQMD) states in the 1997 AQMP that the air quality in Southern California continues to improve. Some of the lowest air pollution levels in decades were recorded in 1995. However, as a result of the local climate, urban development, and continuing growth counteracting point source emission reductions, the region still experiences the worst air quality in the nation. The AQMP proposes policies and measures to achieve federal and state standards for healthful air quality in the region, including the reformulated automobile fuel program (California Cleaner Burning Gasoline), rideshare programs emission credit incentive programs.

The AQMP uses emissions inventories to estimate future impacts to the South Coast Air Basin (SCAB). These future emission forecasts use population and demographic growth forecasts from SCAG. These forecasts are consistent with those used by the District in projecting wastewater flows to 2020. The AQMP states that although per-capita emissions have been brought down substantially in the air basin through management policies, increases in population have off-set those reductions and threaten to overwhelm the progress made to date. The Orange County area is currently in severe non-attainment for ozone and PM_{10}.

Efforts to improve air quality outlined in the AQMP include promoting best available technologies for short-term improvements and implementing low to zero-emission control technologies. Management planning efforts include State Implementation Plans (SIPs) for priority pollutants and continued updating of the AQMP.

IMPACTS AND MITIGATION MEASURES OF SECONDARY IMPACTS OF GROWTH

Impact 11-2: The OCSD Strategic Plan would accommodate planed growth in the Service Area. Implementation of planned growth would result in secondary environmental effects. The effects of planned growth have been identified and addressed in the EIRs on Regional Plans, General Plans for Service Area cities, and associated Specific Plans. Some of the secondary effects of growth which have been identified as significant and unavoidable include air quality and traffic congestion. Significant, unavoidable.

District-Proposed Mitigation

Measure 11-2: OCSD does not have the authority to make land use and development decisions, nor does it have the authority or jurisdiction to address many of the identified significant, secondary effects of planned growth. Authority to implement such measures lies with the County and cities which enforce local, state, and federal regulations through the permit process. Other agencies with authority to require mitigation or with responsibility to implement measures to mitigate the effects of planned growth include regional and state agencies such as the South Coast Air Quality management District (SCAQMD), Regional Water Quality Control Board (RWQCB), California Department of Fish and Game (CDFG), California Department of Health Services (DHS), California Department of Transportation (Caltrans), and federal agencies including U.S. Fish and Wildlife Service (USFWS), U.S. Environmental Protection Agency (EPA), and the U.S. Corps of Engineers (USACE).

Significance After Mitigation: Significant, unavoidable. The project would not improve nor worsen the secondary impacts of planned growth in the Service Area.

Table 11-4 lists agencies in the Southern California region that have the authority to implement major mitigation measures for growth-related impacts. The agencies include local planning departments, utility providers, and State-level resource management agencies. The remaining sections in this chapter briefly highlight possible mitigation measures for growth-related impacts.

MITIGATION MEASURES FROM REGIONAL PLANS

Mitigation measures to off-set the secondary impacts of growth are provided within the SCAG RCPG, AQMP, and RTP EIR. While regional agencies may have the ultimate authority for implementing mitigation measures, local cities and Orange County will also need to cooperate in order to succeed. Socio-economic and land use issues stemming from increased density will be significant issues for local cities. Continued effort by local municipalities to conform with regional planning will reduce cumulative, regional impacts. Ridesharing programs, regional mass transit projects, and highway improvements are proposed in the RTP as means to minimize impacts to transportation. Efforts to manage growth effectively, such as greater density

residential land uses and open space conservation measures, are proposed within the RCPG to help minimize development costs, save natural resources, and enhance the quality of life.

The SCAG RCPG identifies other environmental resources that will experience continued secondary impacts from growth. These resources include noise, public health, land uses, housing, wildlife/open space, energy, and water resources. **Table 11-5** lists growth-related impacts and mitigation measures anticipated for the OCSD Service Area.

WATER CONSERVATION MEASURES

The local jurisdictions and the county should require that existing developments retrofit and new developments be built with water-restricting devices such as low-flow toilets and shower heads. New developments could also use reclaimed water for outdoor areas. Existing residents could be encouraged to reduce their water consumption by sweeping driveways rather than hosing them down, and watering lawns twice a week rather than every day.

Further involvement by local water agencies in water reclamation projects such as the District's Groundwater Replenishment System will reduce the demand for imported water. Reclamation projects continue to be effective mitigation against increased water demand caused by increased growth in arid regions.

MEASURES TO MINIMIZE SOLID WASTE GENERATION

Orange County is responsible for monitoring a program with the cooperation of local jurisdictions and industry to minimize solid waste generation through recycling, cardboard baling programs, and other measures to minimize the waste stream.

ENERGY CONSERVATION MEASURES

Local jurisdictions and the county, in cooperation with the utilities, should require that new developments for residential, industrial and commercial customers be built to include energy conservation measures. Such measures would include implementation of California Title 24 building standards and state and federal appliance efficiency standards. Existing developments could be weather-stripped and insulated to reduce energy consumption.

SITE-SPECIFIC STUDIES AND OTHER MEASURES TO REDUCE OTHER IMPACTS

Local jurisdictions and the county should implement site-specific studies and other measures to reduce other impacts from growth in their jurisdictions. Such studies and planning could occur at the general or specific plan level, and could be implemented through development requirements.

TABLE 11-4
AGENCIES HAVING AUTHORITY TO IMPLEMENT MAJOR MITIGATION MEASURES FOR GROWTH-RELATED IMPACTS

Agency	Authority
Southern California Association of Governments	Formed to provide more effective regional planning in southern California. Charged with providing a framework for orderly regional growth and development; a clearing house for federal grant applications. Responsible for developing regional plans, including: Regional Comprehensive Plan and Guidelines, Regional Transportation Plan, Regional Housing Needs and Employment Assessment, and Air Quality Management Plan.
County of Orange	Responsible for planning, land use, and environmental protection of unincorporated areas. Of particular importance are development of presently undeveloped lands, provision of regional solid waste management facilities, and regional transportation, air quality and flood control improvement programs. The Orange County Board of Supervisors revised the Growth Management Element of its County General Plan on October 19, 1993.
Local cities (within the Sanitation Districts' service area)	Responsible for adoption of local general plans and various planning elements and local land use regulations. Responsible for local collector sewerage facilities. Adopt and implement local ordinances for control of noise and other environmental concerns. Participate in regional air quality maintenance planning through adoption of local programs to control emissions via transportation improvements. Responsible for enforcing adopted energy efficiency standards in new construction.
Local Agency Formation Commission	Empowered to approve or disapprove all proposals to incorporate cities to form special districts or to annex territories to cities or special districts. Also empowered to guide growth of governmental service responsibilities.
Regional Water Quality Control Board, Santa Ana Region	Shares responsibility with SWRCB to coordinate and control water quality. Formulates and adopts water quality control plans for the District's service area. Implements portions of the Clean Water Act when EPA and SWRCB delegate authority, as is the case with issuance of NPDES permits for waste discharge.
State Department of Health	Responsible for the purity and potability of domestic water supplies for the state. Assists SWRCB and RWQCBs in setting quality standards of wastewater discharge.

TABLE 11-4 (Continued)
AGENCIES HAVING AUTHORITY TO IMPLEMENT MAJOR MITIGATION MEASURES FOR GROWTH-RELATED IMPACTS

Agency	Authority
Metropolitan Water District	Responsible for the development, storage, transportation and wholesaling of water to member agencies for domestic and municipal purposes. Obtains water from California State Water Project and Colorado River Aqueduct.
Orange County Water District	Protects and manages the county's groundwater basin. Also provides for importation of water, prevents water waste, provides advanced treatment for reclamation of wastewater for beneficial reuse, and provides for conservation and control of storm water and flood water flowing into the district. Responsible for maintaining and managing groundwater recharge facilities, multi-purpose projects, and sea water intrusion control projects, including the Water Factory 21 advanced treatment facilities.
Orange County Flood Control District	Responsible for providing regional flood control facilities within Orange County. Plan storm drainage and flood control facilities on a countywide, regional basis.
California Air Resources Board	Responsible for adopting and enforcing standards, rules, and regulations for the control of air pollution from mobile sources throughout the state.
South Coast Air Quality Management District	Adopts and enforces local regulations governing stationary sources of air pollutants. Issues Authority to Construct Permits and Permits to Operate. Provides compliance inspections of facilities and monitors regional air quality. Developed the Air Quality Management Plan (AQMP) with SCAG.
California Energy Commission	Requires energy needs forecasts from public utilities serving the District's service area. Considers applications for new energy facilities and certifies as to their need and grants necessary approvals through rigorous regulatory process to assure compliance with environmental protection laws and regulations.

TABLE 11-5
IMPACTS OF GROWTH

Issue	General Impact	Significance	Mitigation Measure to Reduce to Less-Than-Significant
Land Use and Housing	As Orange County and the District's service area grow, there would be a continued conversion of agricultural and open space lands to urban uses, there could be an increase in annexations and incorporations, and there is the potential for decreased housing affordability.	Potentially significant	Local jurisdictions and county should prepare land use plans with open space and agricultural preserves.
Water Quality	Growth in population and employment could lead to the degradation of surface water and groundwater from pollutants released to urban storm runoff or allowed to percolate to groundwater.	Potentially significant	Local jurisdictions should improve groundwater basin management and should link development phasing with new infrastructure.
Economic Development	Expansion of wastewater treatment capacity would allow the area served by the District to remain competitive in attracting both industry that relies on the availability of wastewater treatment capacity and growth in housing market needed for improving subregion's jobs/housing ratio.	Beneficial	None is required.
Geology and Hydrology	Growth in population and employment could lead to increased exposure to siesmic hazards and potential aggravation of landslide and erosion conditions in hilly and mountainous areas.	Potentially significant	Local jurisdictions should continue to identify areas of severe seismic and hydrologic hazard and develop disaster relief programs.
Biological Resources	Growth in population and employment could lead to habitat loss from encroaching development; fragmentation of remaining habitats; and loss of riverine, riparian, and wetland habitats.	Potentially significant	Local jurisdictions should develop habitat conservation plans, require biological surveys of areas prior to development, and require adequate mitigation for developments that would adversely affect listed rare, threatened, or endangered species.
Cultural Resources	Growth in population and employment could lead to possible damage, destruction, or removal of recorded and unrecorded cultural resources.	Potentially significant	Local jurisdictions should require archeological field surveys for developments in areas identified as "sensitive."
Noise	Growth in population and employment could lead to increased noise levels from major transportation facilities and new major industrial developments; such noise levels could be potentially incompatible with surrounding land uses.	Potentially significant	Local and state jurisdictions should require needed noise abatement measures, such as construction of noise barriers and reduction of interior noise levels through building and site design features.

REFERENCES - GROWTH INDUCEMENT AND SECONDARY EFFECTS OF GROWTH

Gayk, Bill, Center for Demographic Research, CSU Fullerton, personal communication, 26 April 1999.

Orange County Sanitation District (OCSD), *Master Plan EIR*, 1989.

OCSD, *Strategic Plan, Volume 3, Chapter 3*, 1999.

South Coast Air Quality Management District, *Air Quality Management Plan*, 1997.

Southern California Association of Governments, *Regional Comprehensive Plan and Guide*, March 1996.

Southern California Association of Governments, *1998 Regional Transportation Plan, Draft Master EIR*, November 1997.

Southern California Association of Governments, *1989 Guidance For Implementation of 1989 AQMP Conformity Procedures,* March 1990

Code of Federal Regulations, Part 51, Subpart W, *Determining Conformity of General Federal Actions to State or Federal Implementation Plans*

CHAPTER 12

REPORT PREPARERS AND PERSONS AND ORGANIZATIONS CONSULTED

CHAPTER 12

EIR AUTHORS AND CONSULTANTS; ORGANIZATIONS AND PERSONS CONSULTED

EIR AUTHORS AND CONSULTANTS

ORANGE COUNTY SANITATION DISTRICT

10844 Ellis Avenue
Fountain Valley, California 92708-7018

This document prepared under the direction of:

Jim Herberg, Project Manager
Angie Anderson, Engineer

ENVIRONMENTAL SCIENCE ASSOCIATES

4221 Wilshire, Suite 480
Los Angeles, California 90010

Leslie Moulton, Project Director and Manager, Project Description, Ocean Discharge, Review of all sections
Tom Barnes, Deputy Project Manager, OCSD Background and Existing Facilities, Project Description, Biological Resources, Traffic, Hazardous Materials, Energy Consumption, Growth Inducement/Secondary Effects of Growth, Alternatives, Cross-Media Environmental Trade-offs
Suet Chau, Assistant to the Deputy Project Manager, Summary, Regional Setting, Cumulative Impacts, Review of sections
Nanette Sartoris, Noise, Energy Consumption, Cultural Resources, Biosolids
Madonna Marcelo, Air Quality
Mah-Tamseel Mir, Land Use and Planning
Magdalene Ma, Biological Resources, Geology, Hydrology, Public Services
Edward Khouganian, Graphic Artist
Rowell Llanillo, Graphic Artist
Diara Wilson, Printing, Word Processing
Melissa Gross, Word Processing

KPL LINDSTROM, INC. – WASTEWATER CONSULTANT

729 Bayview Avenue
Pacific Grove, CA 93950-2508

Kris Lindstrom, Consultant

CAMP DRESSER AND MCKEE - PROJECT ENGINEERS

1925 Pulomar Oaks Way, Suite 300
Carlsbad, CA 92008

Kellene Burn-Lucht, Project Manager

ARCHAELOGICAL RESOURCE MANAGEMENT CORPORATION- CULTURAL RESOURCES

1114 N. Gilbert Street
Anaheim, CA 92801

Carol Demcak, Project Manager

MEC ANALYTICAL SYSTEMS – OCEAN DISCHARGE

2433 Impala Drive
Carlsbad, CA 92008

Doug Diener, Project Manager
Cindy Collins, Scientist

KATZ, OKITSU & ASSOCIATES - TRAFFIC AND CIRCULATION

17852 E. 17th Street, Suite 102
Tustin, CA 94104

Rock Miller, Project Manager
George Dunn, Associate

ORGANIZATIONS AND PERSONS CONSULTED

Lists of people and organizations consulted are provided in the references at the end of each section.

CHAPTER 13

LIST OF ACRONYMS

CHAPTER 13
LIST OF ACRONYMS

ACRONYMS AND ABBREVIATIONS

ACP – Anaheim Citrus Products

ADAF – annual daily average flow

AF – acre-feet

AFY - acre-feet per year

AQMP – Air Quality Management Plan

ARB – Air Resources Board

BFP – belt filter press

BIP - Balanced Indigenous Population

BOD – Biological Oxygen Demand

BMPs - Best Management Practices

Btu – British Thermal Units

CAA – Clean Air Act

***CAFE** - Corporate Average Fuel Efficiency*

Caltrans - California Department of Transportation

CAP - Clean Air Plan

CARB - California Air Resources Board

CCAA - California Clean Air Act

CDFG – California Department of Fish and Game

CDM – Camp Dresser & McKee

CDMG - California Division of Mines and Geology

CEQA - California Environmental Quality Act

CFR – Code of Federal Regulations

CGS – central generation systems

CIP – Capital Improvements Plan

CMA – Congestion Management Agency

CMP – Congestion Management Programs

CMS – Congestion Management System

CNEL *- Community Noise Equivalent Level*

CNG – compressed natural gas

CNPS *- California Native Plant Society*

CO - carbon monoxide

Corps – U.S. Army Corps of Engineers

CSDLAC – County Sanitation Districts of Los Angeles County

cy – cubic yard

CWA - Clean Water Act

dB - decibels

dBA - A-weighted decibels. A measure of sound in units of decibels (dB) on the A-weighted scale. The A-weighted decibel scale simulates the response of the human ear to various frequencies of sound.

DEIR - Draft Environmental Impact Report

DDT – Diethyldimethyl toluene

DFG – California Department of Fish and Game

EIR - Environmental Impact Report

EPA - U.S. Environmental Protection Agency

ft – feet

GAP – Green Acres Project

gpcd – gallons per capita per day

GWR – Groundwater Replenishment

HC - hydrocarbons

HCP – Habitat Conservation Plan

hp - horsepower

I/I – infiltration and inflow

IRWD – Irvine Ranch Water District

Kcu ft – Thousands of cubicfeet

kVA - kilovolt-amperes

kW - kilowatt

kwh – kilowatt-hour

Leq - The energy equivalent noise level (or "average" noise level), is the equivalent steady-state continuous noise level which, in a stated period of time, contains the same acoustic energy as the time-varying sound level that actually occurs during the same period.

Ldn - Noise levels between 10:00 p.m. and 7:00 a.m. are adjusted upward by ten dBA to take into account the greater annoyance of nighttime noise as compared to daytime noise.

LUST - leaking underground storage tank

MG - million gallons

mgd - million gallons per day

mg/L – milligrams/liter

mph – miles per hour

MT/yr – Metric ton per year

MTC - Metropolitan Transportation Commission

msl - mean sea level

NAAQS - National Ambient Air Quality Standards

NES - National Energy Strategy

NO_x - nitrogen oxides

NOP - Notice of Preparation

NPDES - National Pollutant Elimination Discharge System

NTU – turbidity units

O & M – Operations and Maintenance

OCSD – Orange County Sanitation District

OCWD – Orange County Water District

OCTA – Orange County Transportation Authority

OOBS – Ocean Outfall Booster System

O_3 – ozone

O&M– Operations and Maintenance

PAC – Planning Advisory Committee

PAH - Polyaromatic hydrocarbons

Pb – Lead

PDWF – peak dry weather flow

PEIR – Program Environmental Impact Report

PM_{10} - inhalable particulate matter

PS – Pump Station

PWWF – peak wet weather flow

ROG - *reactive organic gases*

ppm - parts per million

RAC – Rate Advisory Committee

ROG - reactive organic gases

R/W - right-of-way

RWQCB - Regional Water Quality Control Board

SAAQS - State Ambient Air Quality Standards

SAR – Santa Ana River

SARI – Santa Ana River Interceptor

SARWQCB –Santa Ana Regional Water Quality Control Board

SAWPA - Santa Ana Watershed Project Authority

SCAG – Southern California Association of Governments

SCAQMD – South Coast Air Quality Management District

SCC - System Capacity Charge

SCE – Southern California Edison

SO_2 - sulfur dioxide

SPCC – Spill Prevention Containment and Countermeasure

SR - State Route

SS - settleable solids

STORM – Storage, Treatment, Overflow, Runoff Model

SWP – State Water Project

SWPPP - Stormwater Pollution Prevention Plan

SWRCB - State Water Resources Control Board

T-BACT - Best Available Control Technology for Toxics

TDS – total dissolved solids

TDM – Transportation Demand Management

TIP – Transportation Improvement Program

TSS – total suspended solids

USDA - U.S. Department of Agriculture

USFWS - United States Fish and Wildlife Service

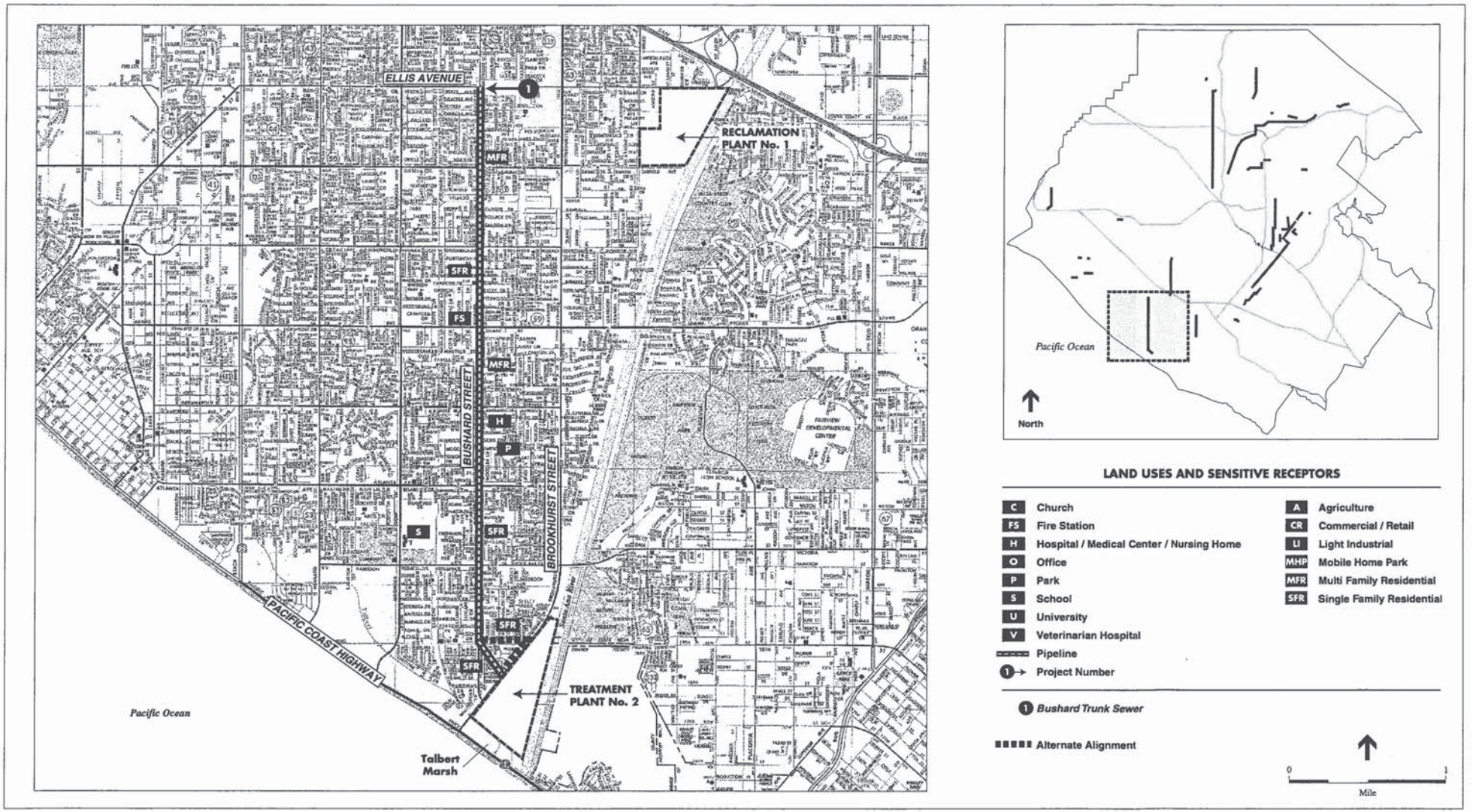
VMT - vehicle miles traveled

MAP APPENDICES

APPENDIX A COLLECTION SYSTEM PIPELINE REPLACEMENT PROJECTS MAPS

APPENDIX B OCSD SERVICE AREA FUTURE LAND USE MAP

APPENDIX A COLLECTION SYSTEM PIPELINE REPLACEMENT PROJECTS MAPS

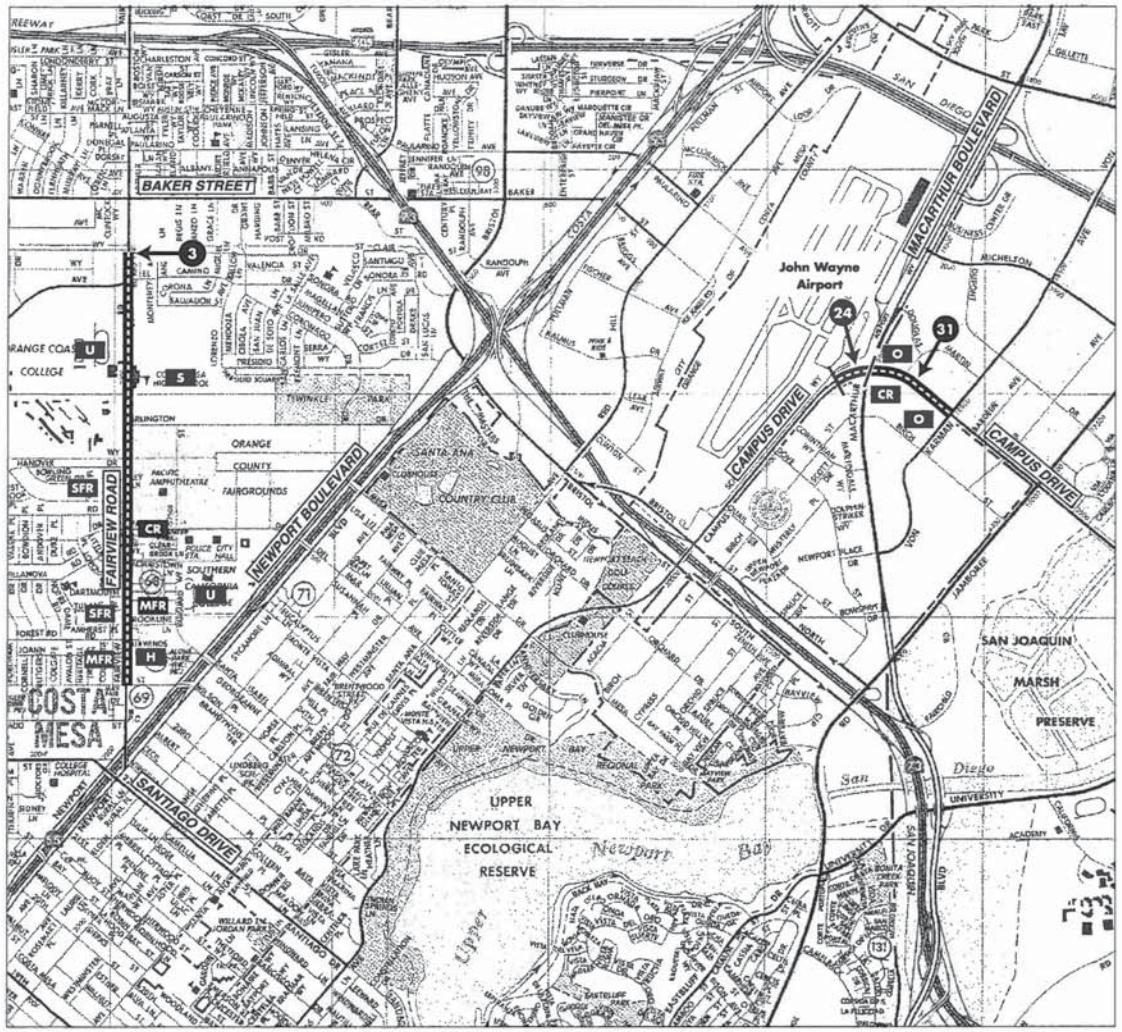


SOURCE: OCSD

OCSD Strategic Plan Program EIR / 960436

Map A1

Proposed Sewer Replacement Project 1



LAND USES AND SENSITIVE RECEPTORS

C	Church	A	Agriculture
FS	Fire Station	CR	Commercial / Retail
H	Hospital / Medical Center / Nursing Home	LI	Light Industrial
O	Office	MHP	Mobile Home Park
P	Park	MFR	Multi Family Residential
S	School	SFR	Single Family Residential
U	University		
V	Veterinarian Hospital		

Pipeline

1→ Project Number

3 *Fairview Relief Sewer*

24 31 *Campus Drive Subtrunk Improvements*

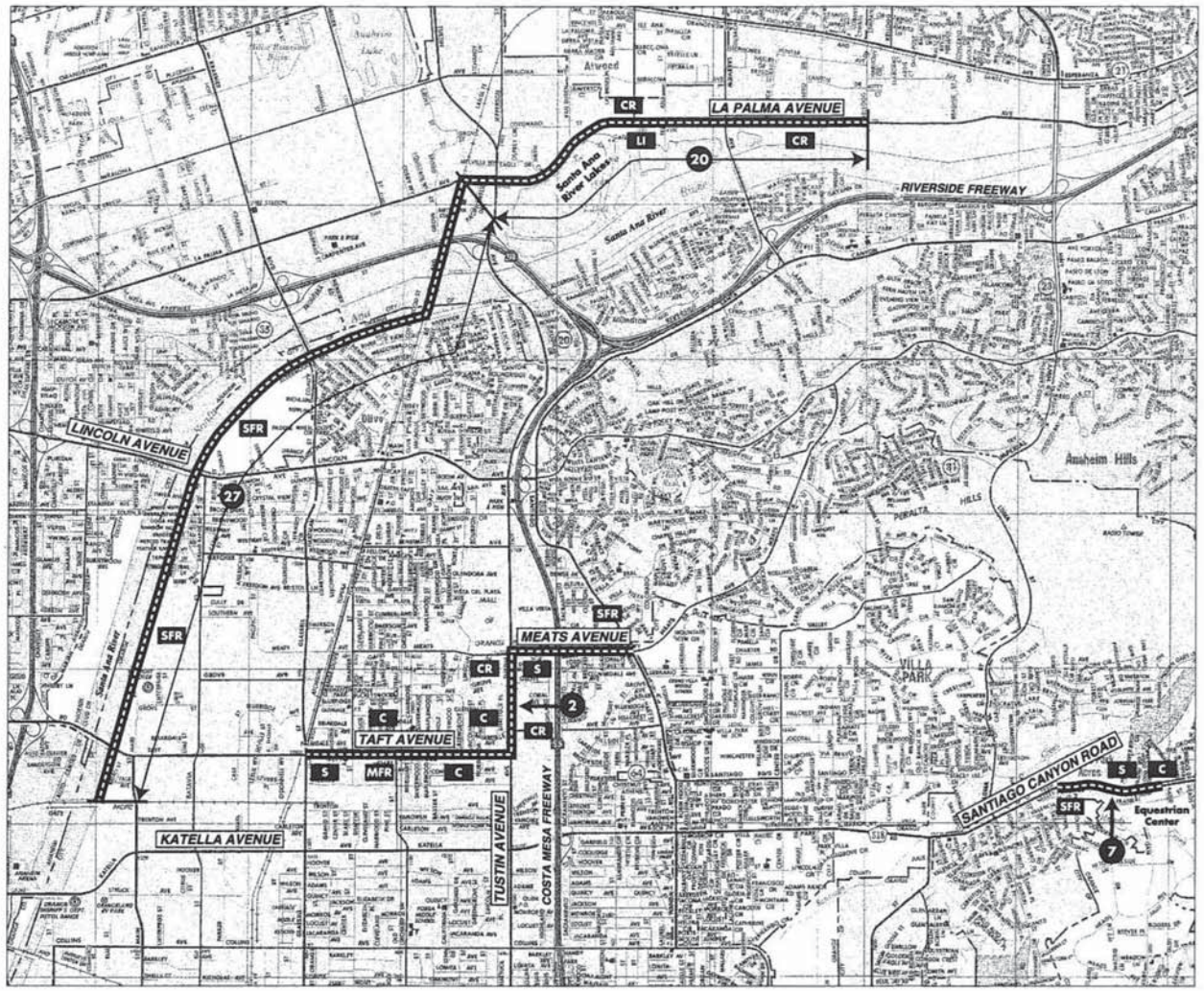
0 1 Mile

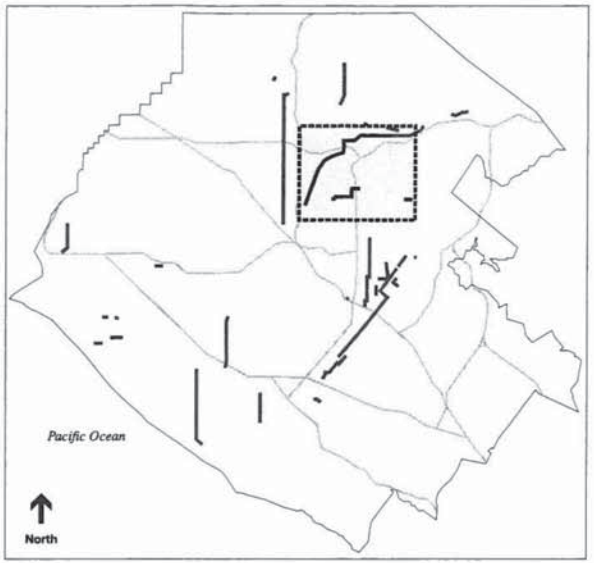
SOURCE: OCSD

OCSD Strategic Plan Program EIR / 960436

Map A2

Proposed Sewer Replacement Projects 3, 24, 31





LAND USES AND SENSITIVE RECEPTORS

- C Church
- FS Fire Station
- H Hospital / Medical Center / Nursing Home
- O Office
- P Park
- S School
- U University
- V Veterinarian Hospital
- Pipeline
- 1 → Project Number
- A Agriculture
- CR Commercial / Retail
- LI Light Industrial
- MHP Mobile Home Park
- MFR Multi Family Residential
- SFR Single Family Residential

- 2 *Taft Branch Improvements*
- 7 *Orange Park Acres Trunk Replacement*
- 20 *Santa Ana River Interceptor Relief - A*
- 27 *Lower SARI Interceptor*

Note:
Project 7 is in the Gisler-Redhill trunk sewer system

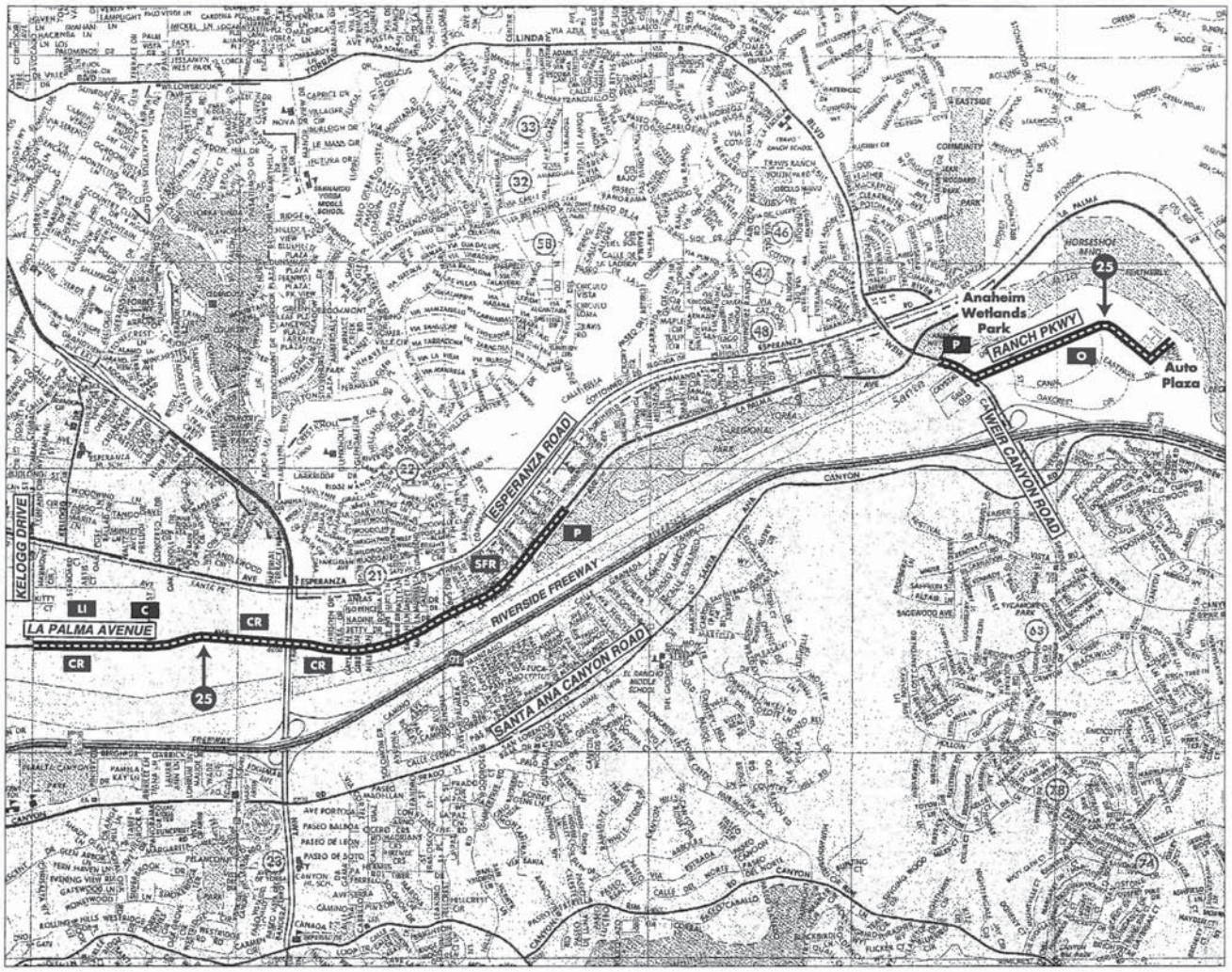
0 1 Mile

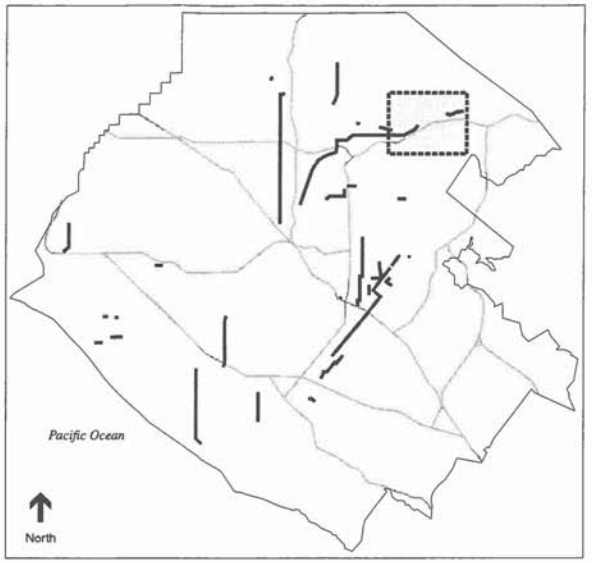
SOURCE: OCSD

OCSD Strategic Plan Program EIR / 960436

Map A3

Proposed Sewer Replacement Projects 2, 7, 20, 27





LAND USES AND SENSITIVE RECEPTORS

- C Church
- FS Fire Station
- H Hospital / Medical Center / Nursing Home
- O Office
- P Park
- S School
- U University
- V Veterinarian Hospital
- Pipeline
- 1 → Project Number

- A Agriculture
- CR Commercial / Retail
- LI Light Industrial
- MHP Mobile Home Park
- MFR Multi Family Residential
- SFR Single Family Residential

25 *Santa Ana River Interceptor Relief - A*

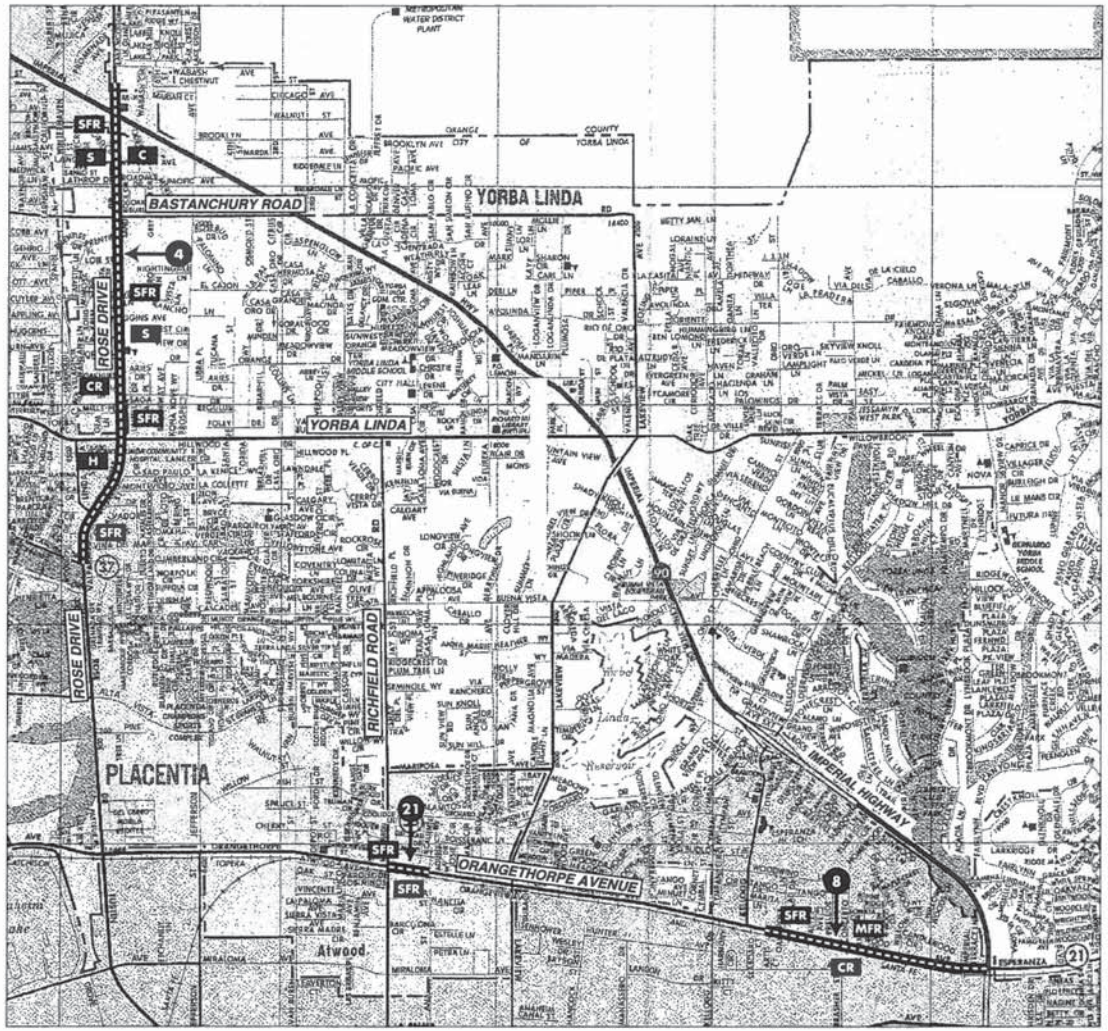
0 1 Mile

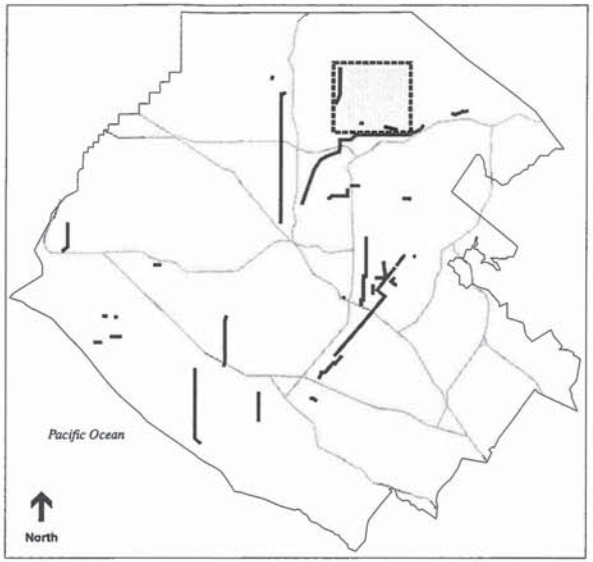
SOURCE: OCSD

OCSD Strategic Plan Program EIR / 960436

Map A4

Proposed Sewer Replacement Projects 25





LAND USES AND SENSITIVE RECEPTORS

C	Church	A	Agriculture
FS	Fire Station	CR	Commercial / Retail
H	Hospital / Medical Center / Nursing Home	LI	Light Industrial
O	Office	MHP	Mobile Home Park
P	Park	MFR	Multi Family Residential
S	School	SFR	Single Family Residential
U	University		
V	Veterinarian Hospital		
	Pipeline		
1→	Project Number		

4 *Carbon Canyon Dam Trunk Improvements*

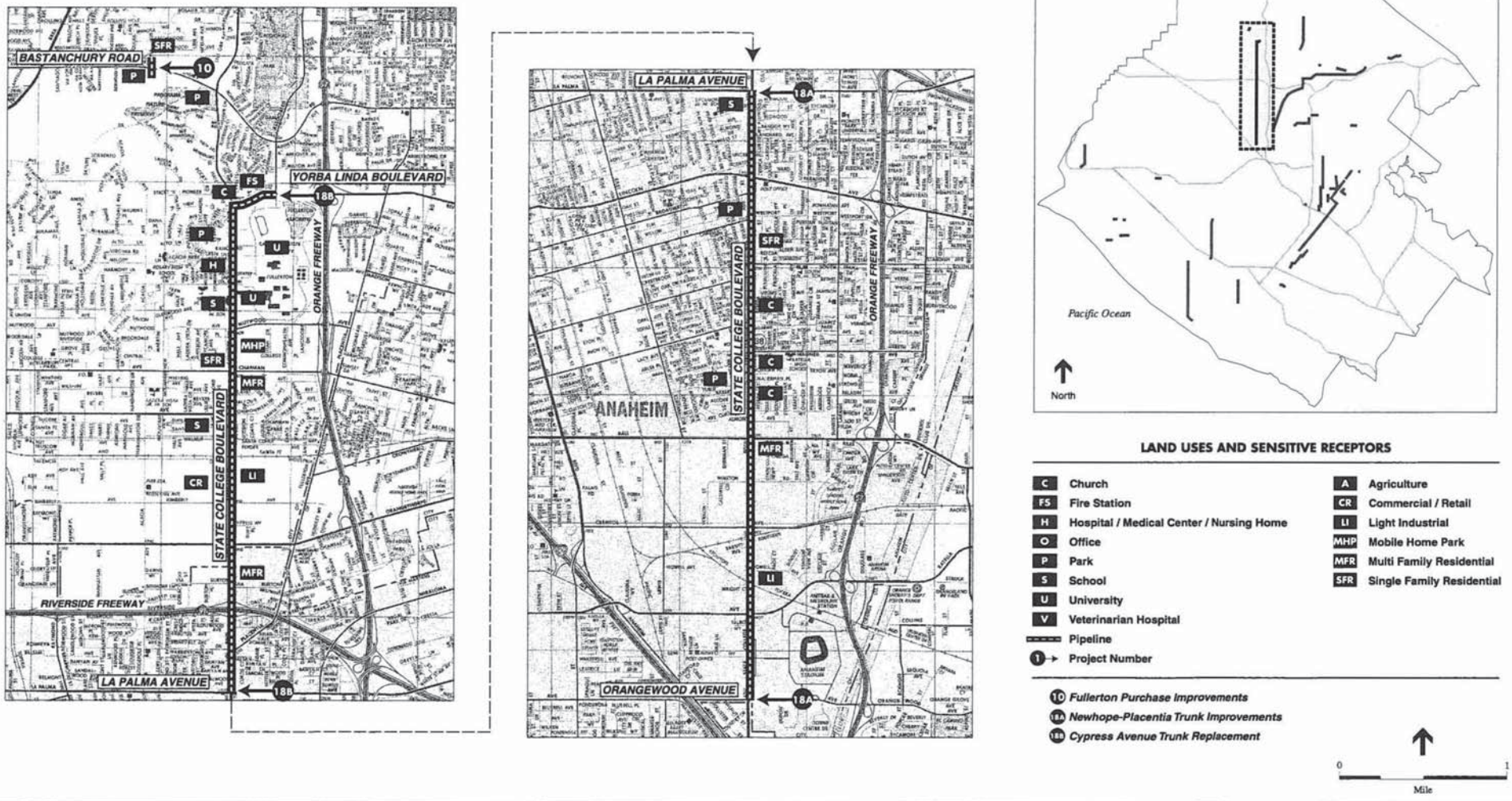
8 21 *Atwood Subtrunk Improvements*

0 1 Mile

SOURCE: OCSD

Map A5

Proposed Sewer Replacement Projects 4, 8, 21

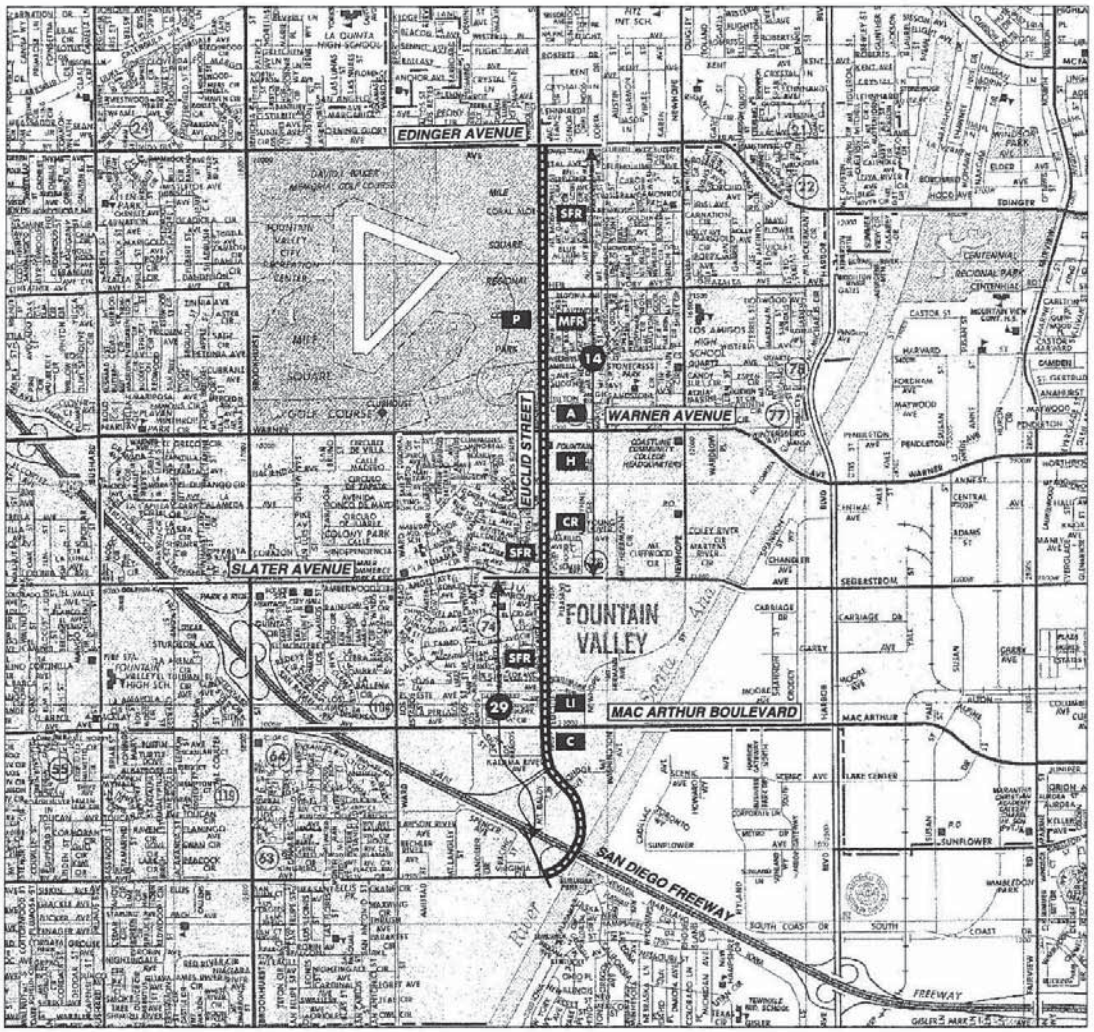


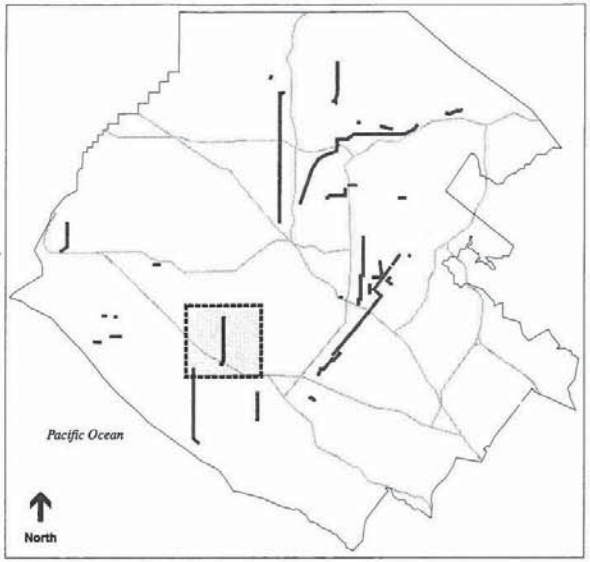
SOURCE: OCSD

OCSD Strategic Plan Program EIR / 960436

Map A6

Proposed Sewer Replacement Projects 10, 18A, 18B





LAND USES AND SENSITIVE RECEPTORS

- C Church
- FS Fire Station
- H Hospital / Medical Center / Nursing Home
- O Office
- P Park
- S School
- U University
- V Veterinarian Hospital
- Pipeline
- 1 → Project Number

- A Agriculture
- CR Commercial / Retail
- LI Light Industrial
- MHP Mobile Home Park
- MFR Multi Family Residential
- SFR Single Family Residential

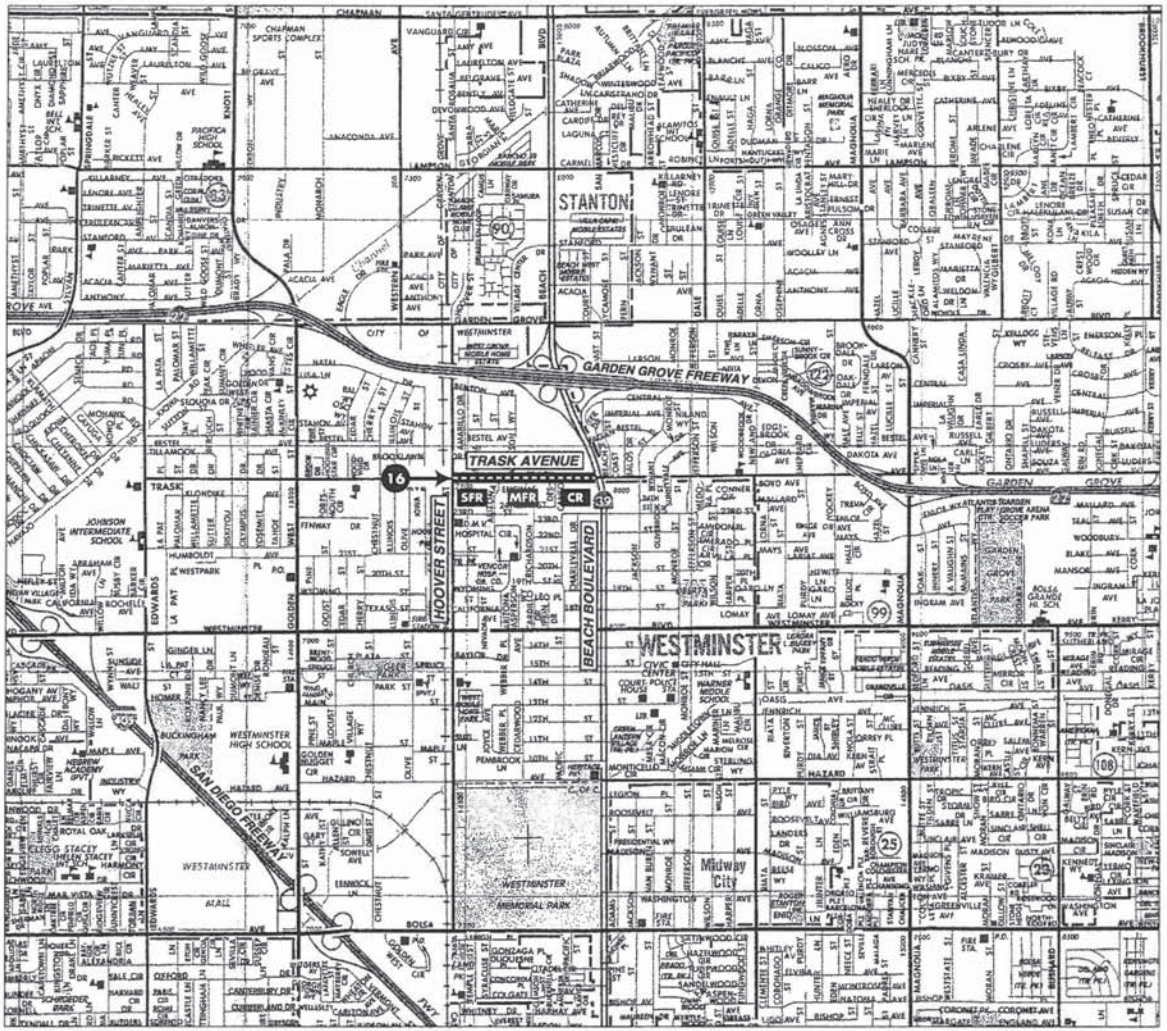
- 14 *Euclid Relief Improvements - A*
- 29 *Euclid Relief Improvements - B*

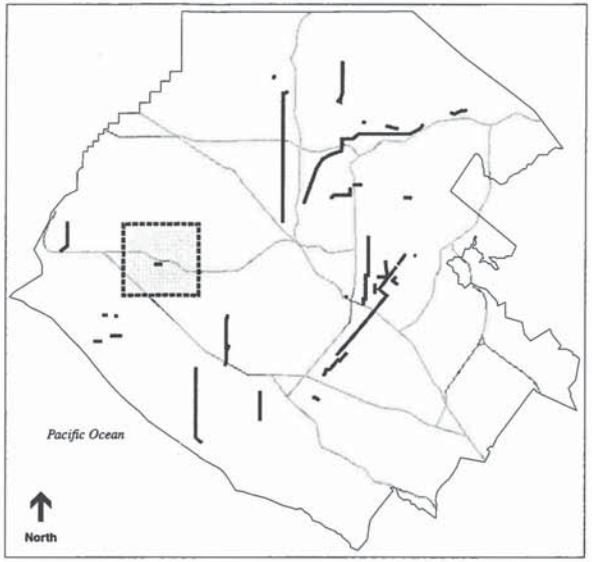
0 1 Mile

SOURCE: OCSD

Map A7

Proposed Sewer Replacement Projects 14, 29





LAND USES AND SENSITIVE RECEPTORS

C	Church	A	Agriculture
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O	Office	MHP	Mobile Home Park
P	Park	MFR	Multi Family Residential
S	School	SFR	Single Family Residential
U	University		
V	Veterinarian Hospital		

Pipeline

1 Project Number

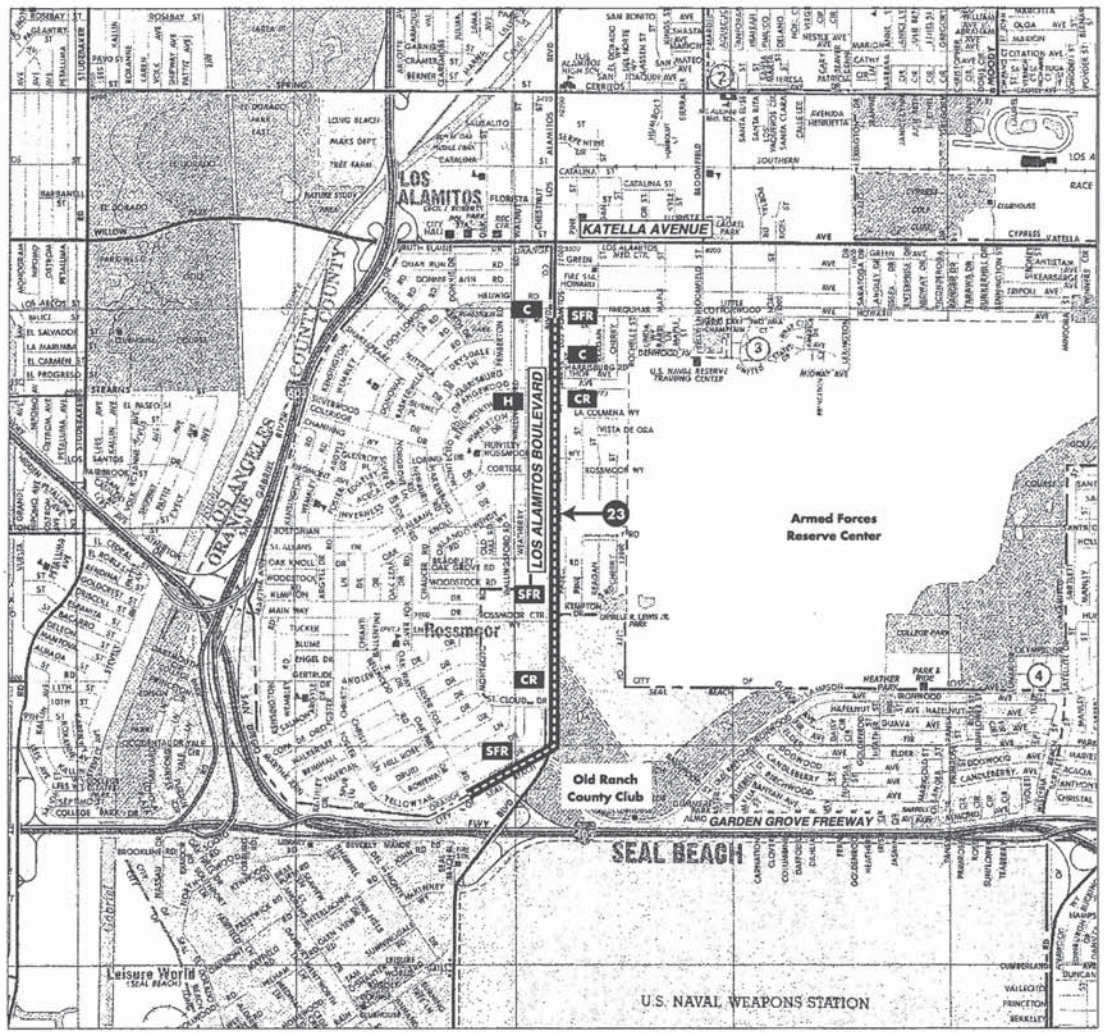
16 *Hoover Feeder Improvements*

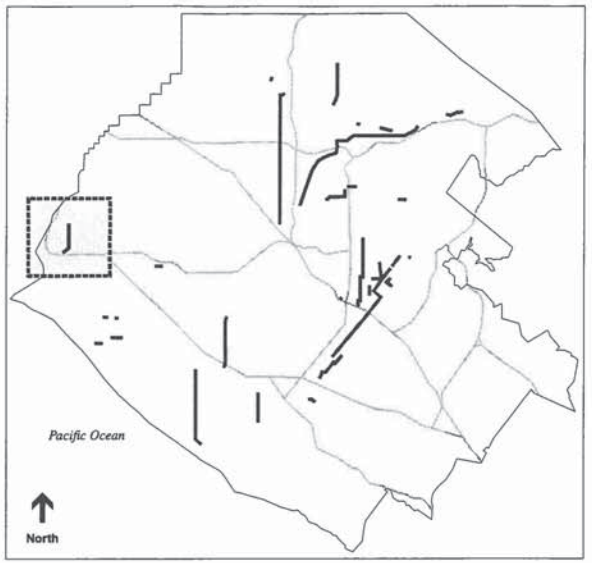
0 1 Mile

SOURCE: OCSD

Map A8

Proposed Sewer Replacement Project 16





LAND USES AND SENSITIVE RECEPTORS

C	Church	A	Agriculture
FS	Fire Station	CR	Commercial / Retail
H	Hospital / Medical Center / Nursing Home	LI	Light Industrial
O	Office	MHP	Mobile Home Park
P	Park	MFR	Multi Family Residential
S	School	SFR	Single Family Residential
U	University		
V	Veterinarian Hospital		
	Pipeline		
1→	Project Number		

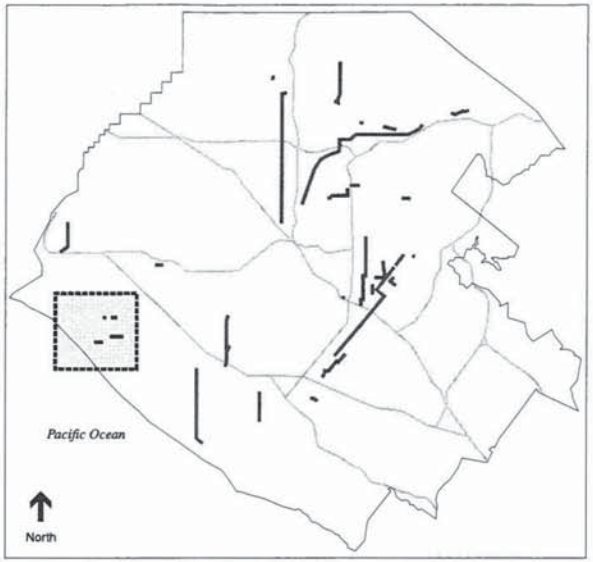
23 *West Side Relief Interceptor Improvements*

0 1 Mile

SOURCE: OCSD

Map A9

Proposed Sewer Replacement Project 23



LAND USES AND SENSITIVE RECEPTORS

- C Church
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- U University
- V Veterinarian Hospital
- Pipeline
- 1 Project Number
- A Agriculture
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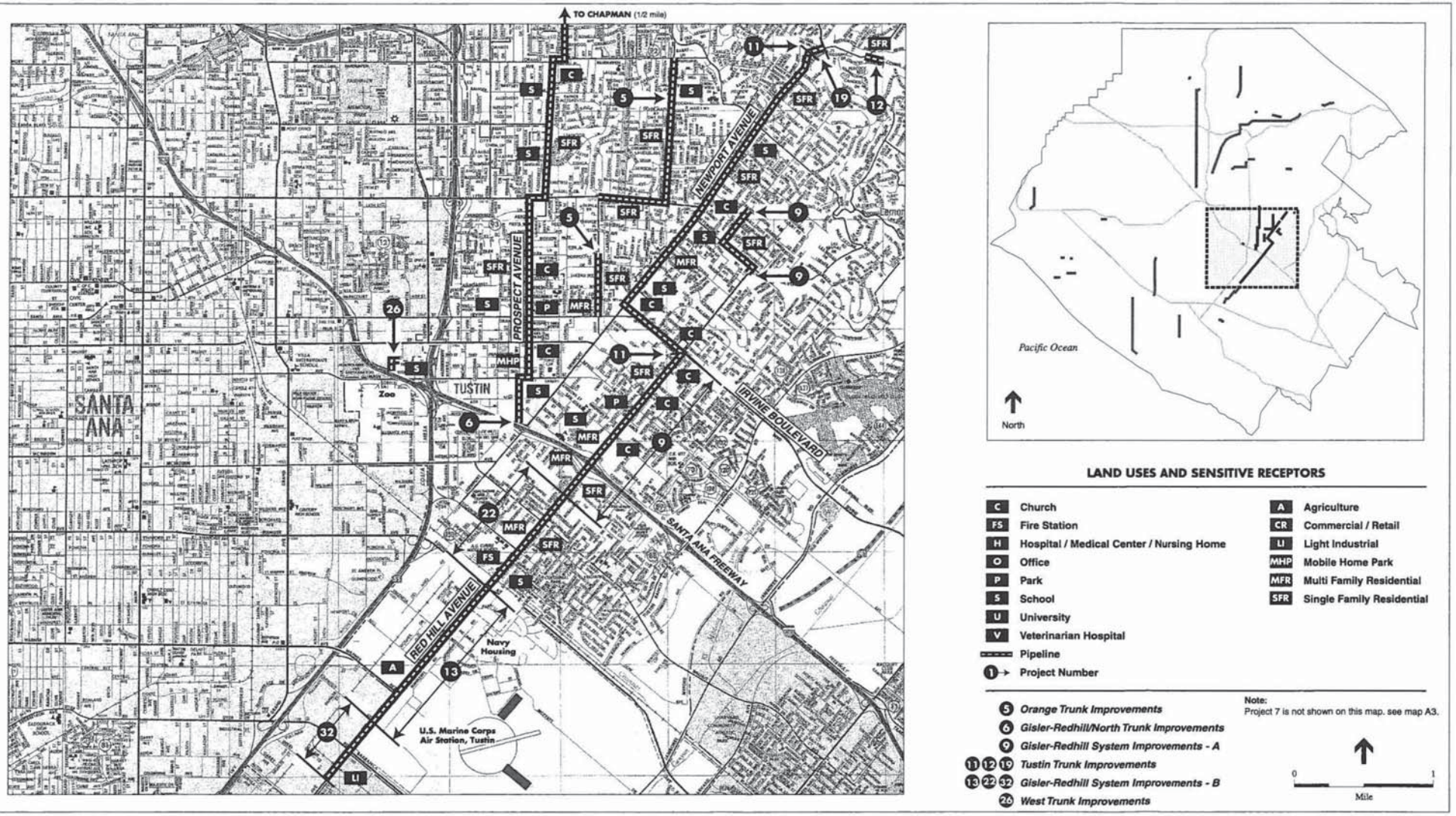
- LI Light Industrial
- MHP Mobile Home Park
- MFR Multi Family Residential
- SFR Single Family Residential

17/28 *Warner Avenue Relief Sewer*
30 *Edinger/Bolsa Chica Trunk Improvements*

0 1
Mile

SOURCE: OCSD

Map A10
Proposed Sewer Replacement Projects 17/28, 30

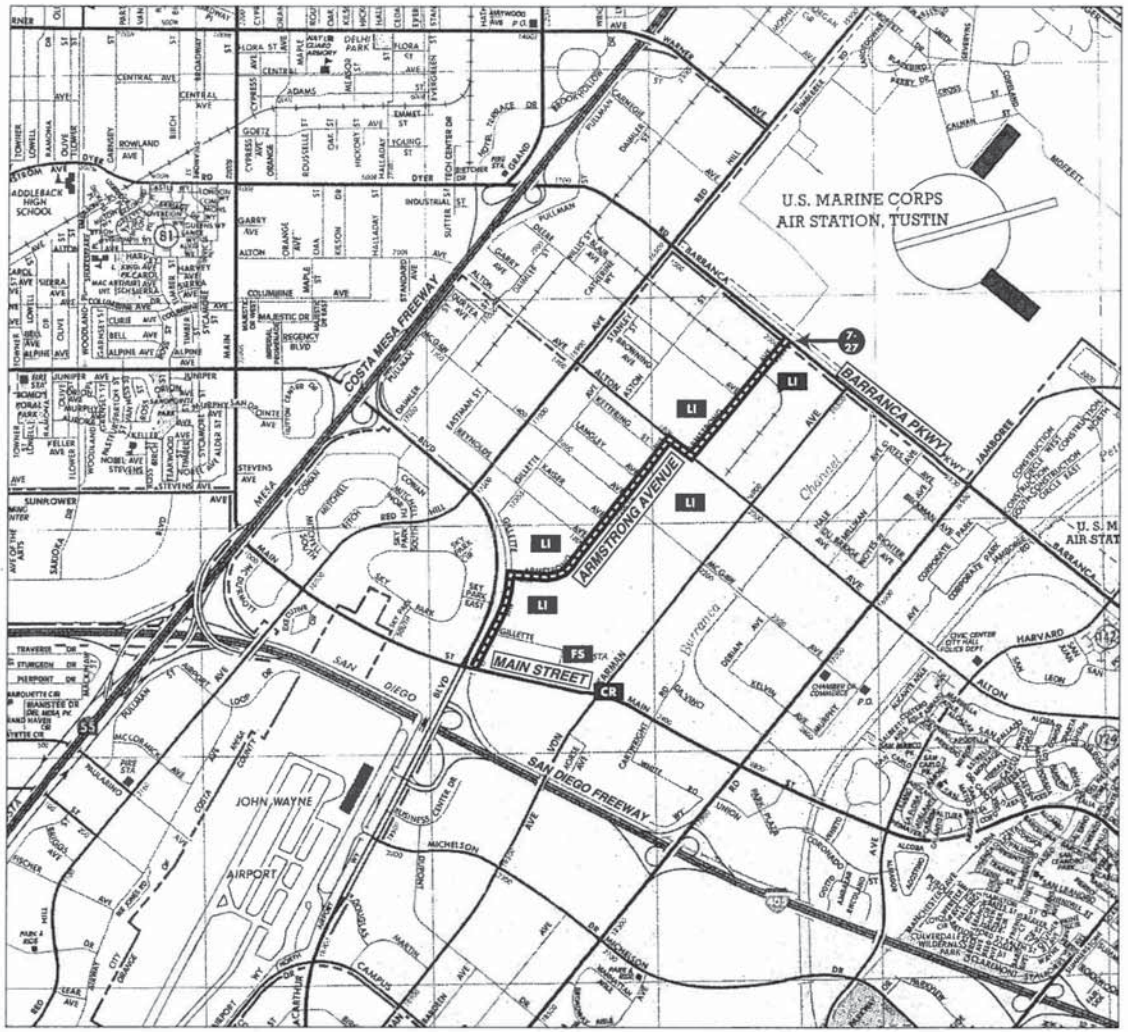


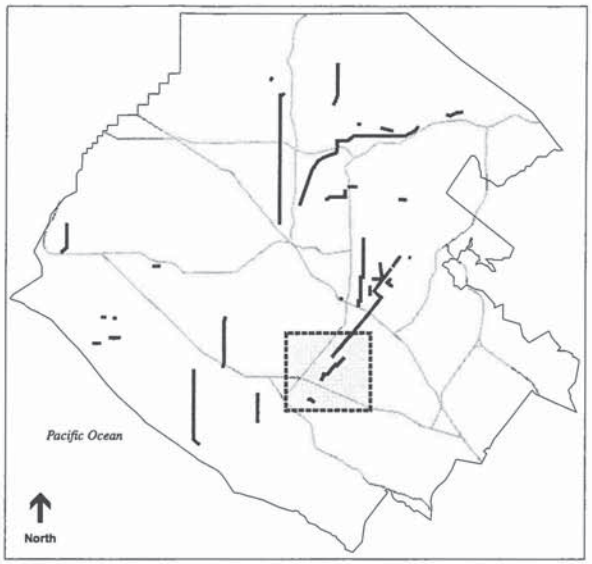
SOURCE: OCSD

OCSD Strategic Plan Program EIR / 960436 ■

Map A11

Proposed Sewer Replacement Projects 5, 6, 9, 11, 12, 13, 19, 22, 26, 32





LAND USES AND SENSITIVE RECEPTORS

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P	Park	MFR	Multi Family Residential
S	School	SFR	Single Family Residential
U	University		
V	Veterinarian Hospital		
	Pipeline		
1	Project Number		

7-27 *Armstrong Subtrunk Sewer*

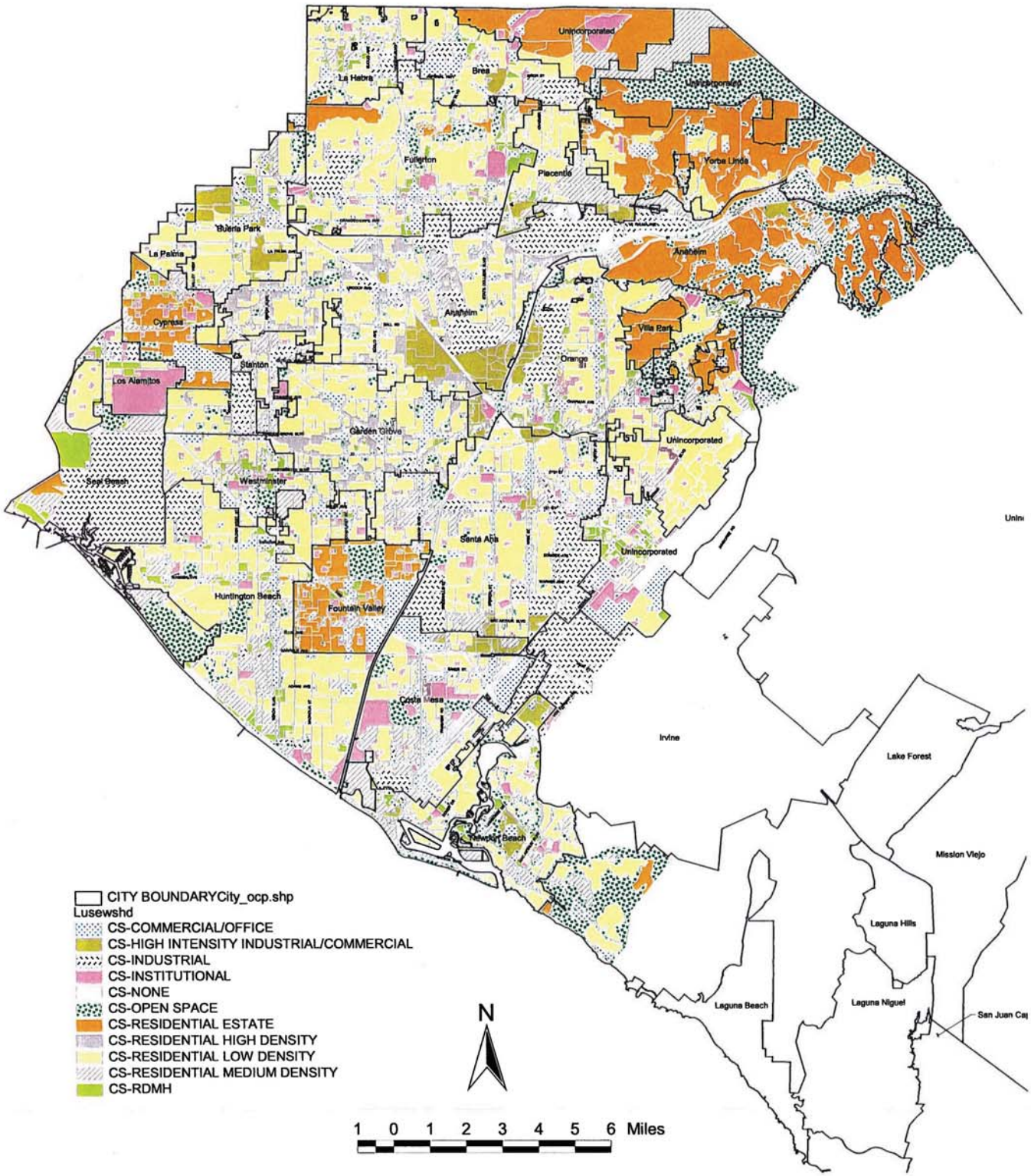
0 1 Mile

SOURCE: OCSD

Map A12

Proposed Sewer Replacement Project 7-27

APPENDIX B OCSD SERVICE AREA FUTURE LAND USE MAP



SOURCE: OCSD Strategic Plan, 1998.

Map B1

OCSD Service Area Future Land Use Map