ORANGE PARK ACRES DOMESTIC WATER DISTRIBUTION AND TRANSMISSION SYSTEM IMPROVEMENTS INITIAL STUDY/FINAL MITIGATED NEGATIVE DECLARATION

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Acronyms and Abbreviations

AADT	average annual daily traffic
AB 32	Assembly Bill 32
ACP	asbestos-cement pipe
AMSL	above mean sea level
AQMP	air quality management plan
Basin	South Coast Air Basin
BAAQMD	Bay Area Air Quality Management District
BAU	business as usual
BMP	best management practice
CAGN	coastal California gnatcatcher
Cal/OSHA	California Occupational Safety and Health Administration
Caltrans	California Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CMP	congestion management program
CNDDB	California Natural Diversity Database
CNEL	community noise equivalent level
CNPS	California Native Plant Society
CO_2e	carbon dioxide equivalent
CSS	coastal sage scrub
DAMP	drainage area management plan
dBA	decibels in the A-weighted scale
EFZ	Earthquake Fault Zone
EOCWD	East Orange County Water District
FTA	Federal Transit Administration
GHG	greenhouse gas
gpm	gallons per minute
HGL	hydraulic grade line
ICU	intersection capacity utilization
IRWD	Irvine Ranch Water District
IS/MND	initial study/final mitigated negative declaration
LIP	local implementation plan
LOS	level of service
LST	localized significance threshold
LUFT	leaking underground fuel tank
Metropolitan	Metropolitan Water District of Southern California

MGD	million gallons per day
MM	mitigation measure
MUTCD	Manual on Uniform Traffic Control Devices
MWRP	Michelson Water Reclamation Plant
NAHC	Native American Heritage Commission
NCCP/HCP	Orange County Natural Community Conservation Plan/Habitat Conservation Plan
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NNG	nonnative grassland
NPDES	National Pollutant Discharge Elimination System
NROC	Nature Reserve of Orange County
OCFA	Orange County Fire Authority
OCTA	Orange County Transportation Authority
OCWD	Orange County Water District
OPA	Orange Park Acres
OPAMWC	Orange Park Acres Mutual Water Company
PPV	peak particle velocity
proposed project	Orange Park Acres Domestic Water Distribution and Transmission System Improvements
PRV	pressure reducing stations
PVC	polyvinyl chloride
RCPG	regional comprehensive plan and guide
RWQCB	regional water quality control board
SAMP	sub area master plan
SARWQCB	Santa Ana Regional Water Quality Control Board
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SWPPP	stormwater pollution and prevention program
USFWS	United States Fish & Wildlife Service
V/C	volume to capacity
VdB	velocity in decibels
WATCH	Work Area Traffic Control Handbook
WQMP	water quality management plan

Chapter 1
Introduction

Overview

Irvine Ranch Water District (IRWD) has prepared this initial study/final mitigated negative declaration (IS/MND) to evaluate the potential environmental consequences associated with improvements to the domestic water distribution and transmission system identified as part of the Orange Park Acres Subarea Master Plan (proposed project), located in portions of the City of Orange and the Orange Park Acres community within unincorporated portions of the County of Orange. Prior to consideration of the project by the Board of Directors, the proposed project is required to undergo an environmental review pursuant to the California Environmental Quality Act (CEQA).

Authority

The preparation of this IS/MND is governed by two principal sets of documents: CEQA (Public Resources Code Section 21000, et seq.) and the State CEQA Guidelines (California Code of Regulations Section 15000, et seq.).

One of the main objectives of CEQA is to disclose to the public and decision makers the potential environmental effects of proposed activities. CEQA requires that the lead agency determine whether a project is subject to CEQA review or is exempt under statutory exemptions (State CEQA Guidelines, Article 18, Sections 15260 et seq.) or categorical exemptions (State CEQA Guidelines, Article 19, Section 15300 et seq.). IRWD determined that the project is not exempt from CEQA and therefore proceeded to prepare an initial study to determine whether an environmental impact report, a negative declaration, or a mitigated negative declaration is appropriate. IRWD is the lead agency for the proposed project under CEQA.

The preparation of initial studies is guided by Section 15063 of the State CEQA Guidelines, and Sections 15070–15075 of Article 6 guide the process for the preparation of an MND. Where appropriate and supportive to an understanding of the issues, reference will be made to the statute, the State CEQA Guidelines, or appropriate case law.

This IS/MND meets CEQA content requirements by including a project description; a description of the environmental setting, potential environmental impacts, and mitigation measures for any significant effects; discussion of consistency with plans and policies; and names of preparers.

Scope of the Initial Study/Mitigated Negative Declaration

This IS/MND evaluates the proposed project's effects on the following resource topics:

- Aesthetics.
- Land use planning.

- Agriculture and forest resources.
- Air quality.
- Biological resources.
- Cultural resources.
- Geology and soils.
- Greenhouse gas emissions.
- Hazards and hazardous materials.
- Hydrology and water quality.
- Mineral resources.
- Noise.
- Population and housing.
- Public services.
- Recreation.
- Transportation and traffic.
- Utilities and service systems.

Impact Terminology

The following terminology is used to describe the level of significance of impacts.

- A finding of *no impact* is appropriate if the analysis concludes that the project would not affect the particular topic area in any way.
- An impact is considered *less than significant* if the analysis concludes that it would cause no substantial adverse change to the environment and requires no mitigation.
- An impact is considered *less than significant with mitigation incorporated* if the analysis concludes that it would cause no substantial adverse change to the environment with the inclusion of environmental commitments that have been agreed to by the applicant.
- An impact is considered *potentially significant* if the analysis concludes that it could have a substantial adverse effect on the environment.

Organization of the Initial Study/Mitigated Negative Declaration

The content and format of this report are designed to meet the requirements of CEQA. The report contains the following sections:

- Chapter 1, "Introduction," identifies the purpose and scope of this IS/MND and the terminology used in the report.
- Chapter 2, "Project Description," identifies the location, setting description, background, and planning objectives of the project and describes the proposed project in detail.
- Chapter 3, "Initial Study Environmental Checklist," presents the CEQA environmental checklist and responses for each resource topic within the checklist. This section includes a brief setting section for each resource topic and identifies the impacts of implementing the proposed project.
- Chapter 4, "References," identifies all printed references and individuals cited in this IS/MND.
- Chapter 5, "List of Preparers," identifies the individuals who prepared this report and their roles in the project.

Chapter 2
Project Description

Introduction and Overview

The proposed project involves major upgrades to the existing water distribution and transmission system in the IRWD Orange Park Acres (OPA) service area. The improvements are located within the City of Orange and unincorporated county area, and are identified in the Orange Park Acres Sub Area Master Plan (SAMP) prepared on behalf of IRWD by Stantec (2009). These improvements are intended to provide a more reliable water distribution and transmission system, a connection to the existing IRWD domestic water supply system, and increased water pressure and flow to residents in the OPA service area. Additional details regarding the proposed project description and location are included in this chapter.

Project Background

The OPA service area formerly operated as the Orange Park Acres Mutual Water Company (OPAMWC) and was consolidated with IRWD in June 2008 when IRWD acquired OPAMWC. The OPA service area is primarily located within the unincorporated County of Orange area, with the remaining areas within the City of Orange. The pipeline distribution system in the OPA service area is very old, approaching 81 years in some areas with riveted steel pipe constructed in 1929. This older pipeline is scattered throughout the existing system; however, a majority of it is located within the south and west portions of the project area, specifically along Bond Avenue, Rancho Santiago Boulevard, Meads Avenue, and Orange Park Boulevard. The remaining system has been installed since the 1960s. The pipeline materials range widely and include steel, asbestos-cement, ductile-iron, and polyvinyl chloride (PVC). The system has a history of leaking, primarily in the old riveted steel pipe areas. Since the consolidation, IRWD has been repairing and replacing the old and leaking pipes as much as possible, including installing new fire hydrants, interconnections with the City of Orange, and valves where needed. As a result of the SAMP studies, it has been determined that the transmission main requires replacement (Stantec 2009a).

Additionally, fire flow protection for the upper elevations within the west service area is inadequate. Due to the hydraulic grade of 623 feet for the existing water system and service pad elevations up to 635 feet or higher, there are five hydropneumatic boosters that serve isolated portions of the OPA service area. None of them are able to provide adequate fire flow requirements based on established fire flow requirements, assumed to be a sustained flow rate of 1,500 gallons per minute (gpm) for a duration of 2 hours (Stantec 2009a).

Project Location

Regional Location

The project area is located in north-central Orange County, within the unincorporated Orange Park Acres community of the County of Orange and portions of the City of Orange. Figure 2-1 depicts the regional location of the project area.

Local Vicinity

The OPA service area encompasses approximately 646 acres, and is generally bounded to the north and east by Santiago Canyon Road, to the west by Rancho Santiago Boulevard, and to the south by Chapman Avenue. There are three major OPA sub-service areas containing approximately 540 existing dwelling units, designated as east, west, and central. The existing community is characterized primarily by equestrian-oriented single family homes, with the majority being 1-acre lots. Figure 2-2 shows the local vicinity of the proposed project, east, west, and central service areas, as well as existing and surrounding land uses relative to the OPA service area (Stantec 2009a).

East Service Area

The east area is within the City of Orange and is east of Kennymead Avenue straddling Santiago Canyon Road. The east area includes the Holy Sepulchre Cemetery east of Santiago Canyon Road.

West Service Area

The west area is primarily in the City of Orange; is the smallest of the three areas; and is generally bounded by Rancho Santiago Boulevard, Glen Albyn, and Bond Avenue. The west area includes a nursery (Santiago Greenhouses) along Bond Avenue west of Rancho Santiago Boulevard as well as the former OPAMWC headquarters located along Gravier at Bond Avenue, which is also where the OPA well is located.

Central Service Area

The central area is the largest and main area of OPA bisected by Orange Park Boulevard and is mostly within unincorporated County area, with a few areas within the City of Orange. The Central area includes the Ridgeline Country Club with the former Ridgeline Golf Course, which is now closed. However, the tennis complex and related services, the wedding and banquet center, and the swim club remain open. The Ridgeline Country Club has been approved for the future development of 39 equestrian-oriented homes on 1-acre lots, with a 16,000-square-foot public equestrian arena and 1 mile of multi-purpose trails. The central area also includes an existing church and school, the Salem Lutheran Church and School, located at the corner of Frank Street and Orange Park Boulevard.

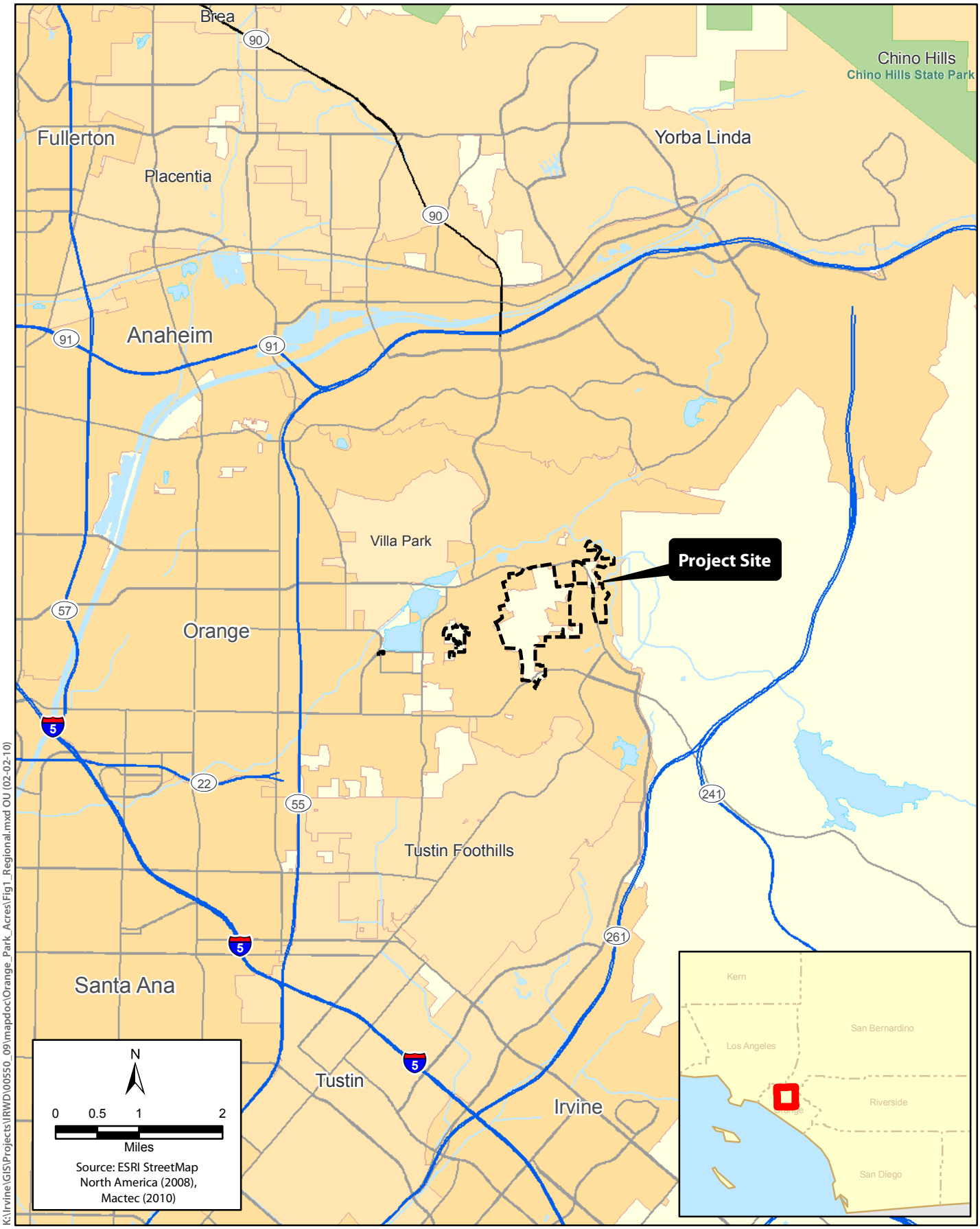

Figure 2-1
Regional Location
Orange Park Acres - Domestic Water Distribution and Transmission System Improvements Project

LEGEND

- IRWD BOUNDARY / OPA SERVICE AREA
- LOW DENSITY RESIDENTIAL (2.33 DU/AC)
- ESTATE DENSITY RESIDENTIAL (0.84 DU/AC)
- RURAL ESTATE DENSITY RESIDENTIAL (0.46 DU/AC)
- CEMETERY
- OPEN SPACE/VACANT LOT/ROADS/ETC.
- NURSERY
- GOLF COURSE
- SCHOOL / CHURCH

OPA CENTRAL SERVICE AREA

OPA EAST SERVICE AREA

CITY OF ORANGE

SANTIAGO CANYON ROAD

FRANK STREET

CLARK AVE

GRAY LANE

RANDALL ST

RANDALL STREET

MIRALOMA AVENUE

KENNYWEED

SANDBERG LN

LOMITA ST

MORADA DRIVE

HILLTOP LANE

MONTVIEW CIRCLE

ORANGE PARK BLVD

HANDY CREEK

ACRE PLACE

HIGH TOP LANE

HILLSIDE DRIVE

MEADS AVENUE

HOLY SEPULCHRE CEMETERY

RIDGELINE COUNTRY CLUB (FORMER RIDGELINE GOLF COURSE)

CITY

COUNTY

LOMA VISTA

ROGERS DR

FLYING E LANE

REEVES PLACE

MADRID LANE

MEADOW LANE

VICKIE LANE

SHERLAND LANE

PRIVATE DRIVE

MACDONALD LANE

DANIEL LANE

ORANGE PARK LANE

GLENN DRIVE

GOLDEN CIRCLE

AMAPOLA AVENUE

RANCHWOOD TRAIL

SADDLE BACK DR.

HORSE SHOE ROAD

CHAPMAN AVENUE

ORANGE HILL TERRACE

CASTLE

GRANDE

E SANTIAGO CANYON RD

IRWD BOUNDARY

OPA WEST SERVICE AREA

EXISTING 1.5 MG TANK

N. HEWES ST

N. CANNON STREET

GLEN ALBYN LANE

EQUESTRIAN LN

LOMITA AVE

RANCHO SANTIAGO BLVD

NURSERY

ORANGE FLOOD CONTROL BASIN

N. PROSPECT ST

E. BOND AVE

BOND AVE

GRAEBER

WELL SITE FORMER OPAMWC HEADQUARTERS

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Source: Stantec (2010)

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Figure 2-2
Existing Land Uses
Orange Park Acres - Domestic Water Distribution and Transmission System Improvements Project

Existing Conditions

The existing water distribution and transmission supply facilities within the OPA service area are in poor condition due to age, deterioration, and the lack of comprehensive system upgrades. The existing system operations, OPA reservoir, East Orange County Water District (EOCWD) turnout, transmission and distribution pipelines, booster stations, Emergency interconnections, interim fire protection improvements, and telemetry are described in additional detail below. The existing water system is shown in Figure 2-3.

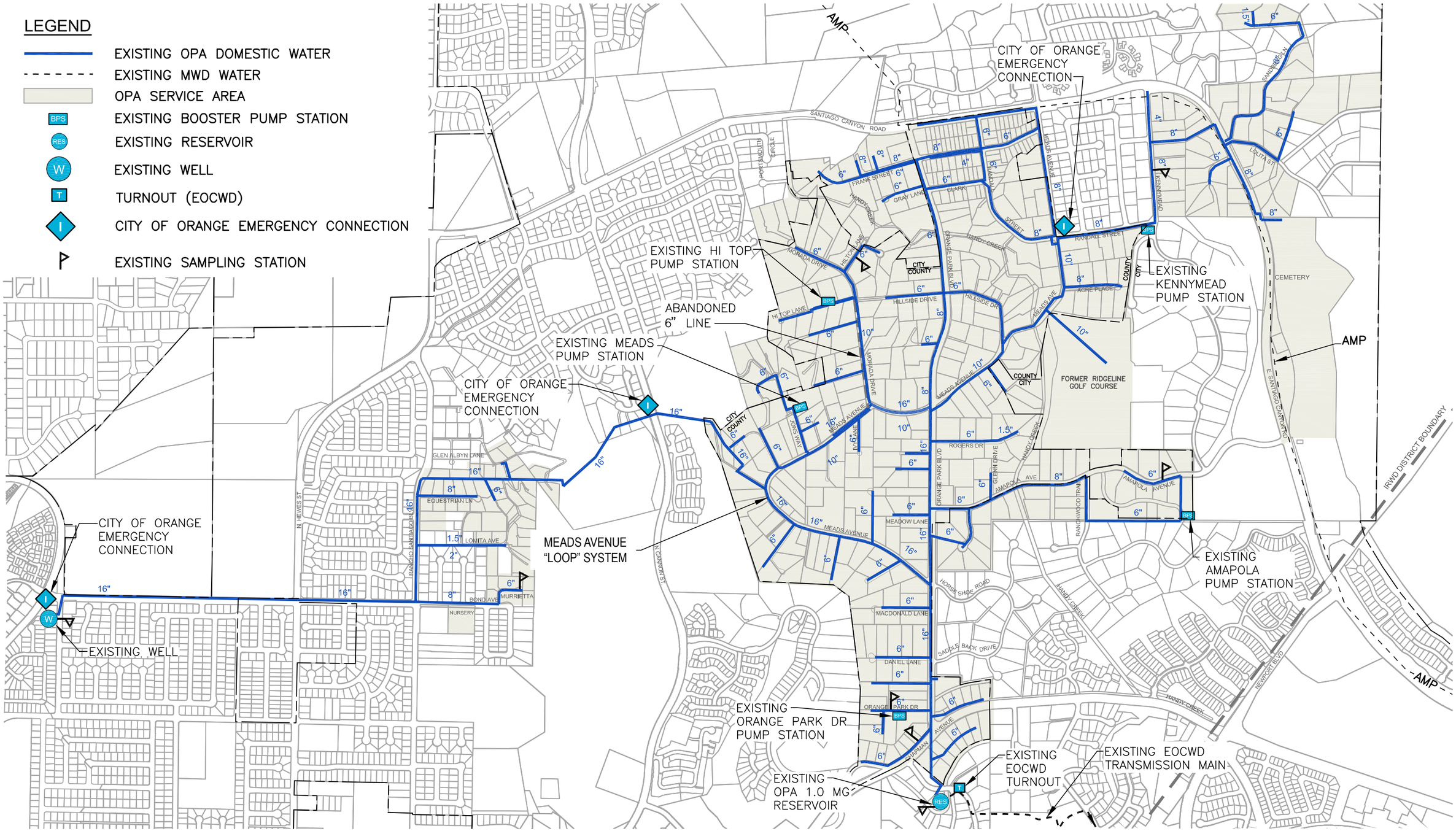
System Operations

The average annual water use for the OPA service area is approximately 863 acre-feet per year, or 0.77 million gallons per day (MGD). The OPA service area is primarily supplied from a single existing groundwater well, the OPA well, located at the former OPAMWC headquarters at Gravier Street, south of Bond Avenue in the City of Orange (see Figure 2-3). This well has 1,900-gpm capacity but is currently equipped with a well pump that supplies 900 gpm into the system and is in very poor operating condition. The current peak hourly demand is estimated to be approximately 1,423 gpm. Existing residential fire flows are 1,500 gpm for 2 hours, and non-residential fire flows are 2,500 gpm for 3 hours. In addition to the well water, imported treated water supply is purchased from EOCWD via the EOCWD turnout located at the OPA reservoir site. The supply source for this imported water is treated Metropolitan Water District of Southern California (Metropolitan) water. In order to keep up with the supply demand and the storage volume requirements for the OPA service area, the EOCWD turnout generally supplies about 1,000 gpm into the system.

There is a high point in the existing OPA transmission main at the top of the hill between Cannon Street and Rancho Santiago Boulevard that does not allow the OPA reservoir to provide sufficient positive pressure to the OPA west service area. As a result, both the OPA well and EOCWD turnout must be operational in order to maintain adequate water pressure at homes located in the upper elevations of the OPA west service area (Stantec 2009a).

The SAMP identifies the ultimate well production capacity of 3,870 gpm, which is the anticipated total maximum daily demand for the OPA service area and the future development for East Orange and Santiago Hills II planning areas. This ultimate demand is proposed to be supplied by two new wells, with one new well to be constructed in the near future, which is intended to replace the existing OPA well. The second well would be constructed in the distant future when the East Orange and Santiago Hills II planned community development are completed. As a part of the LAFCO approval of the Orange Park Acres annexation to IRWD, the August 2006 agreement between the City of Orange and IRWD states that groundwater wells operated by IRWD within the City of Orange's Sphere of Influence shall only serve water customers within the City's Sphere of Influence. Future groundwater wells will be constructed in accordance with this agreement.

These wells are not included as elements of the proposed project. IRWD will be preparing separate CEQA documentation to address the potential environmental impacts of the two new OPA wells. Groundwater modeling will be performed and will also be included in the CEQA documentation. Each of the wells will require separate construction contracts, namely well drilling and wellhead facilities, and will be constructed separate from this project, which is for improvements to the OPA domestic water distribution and transmission system. With the corresponding CEQA documents, the



Source: Stantec (2010)

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Figure 2-3
Existing Domestic Water System
Orange Park Acres - Domestic Water Distribution and Transmission System Improvements Project

replacement well is scheduled for fiscal year 2010–2011. The future well drilling and wellhead equipping is not anticipated until year 2017 or later.

OPA Reservoir and EOCWD Turnout

The OPA reservoir is a concrete storage tank with a capacity of 1.0 million gallons, located south of Chapman Avenue along Calle Grande (Figure 2-3). The tank is approximately 130 feet in diameter and 10 feet high, with the majority of the tank buried. The bottom floor elevation is about 613 feet above mean sea level (AMSL), and the high water elevation is 623 feet AMSL.

Using a hydraulic model that was created and calibrated for the existing domestic water system, it was determined that the reservoir and associated booster pump stations do not provide sufficient hydraulic grade line, or pressures, to maintain optimum service pressures, particularly for the OPA West Service Area.

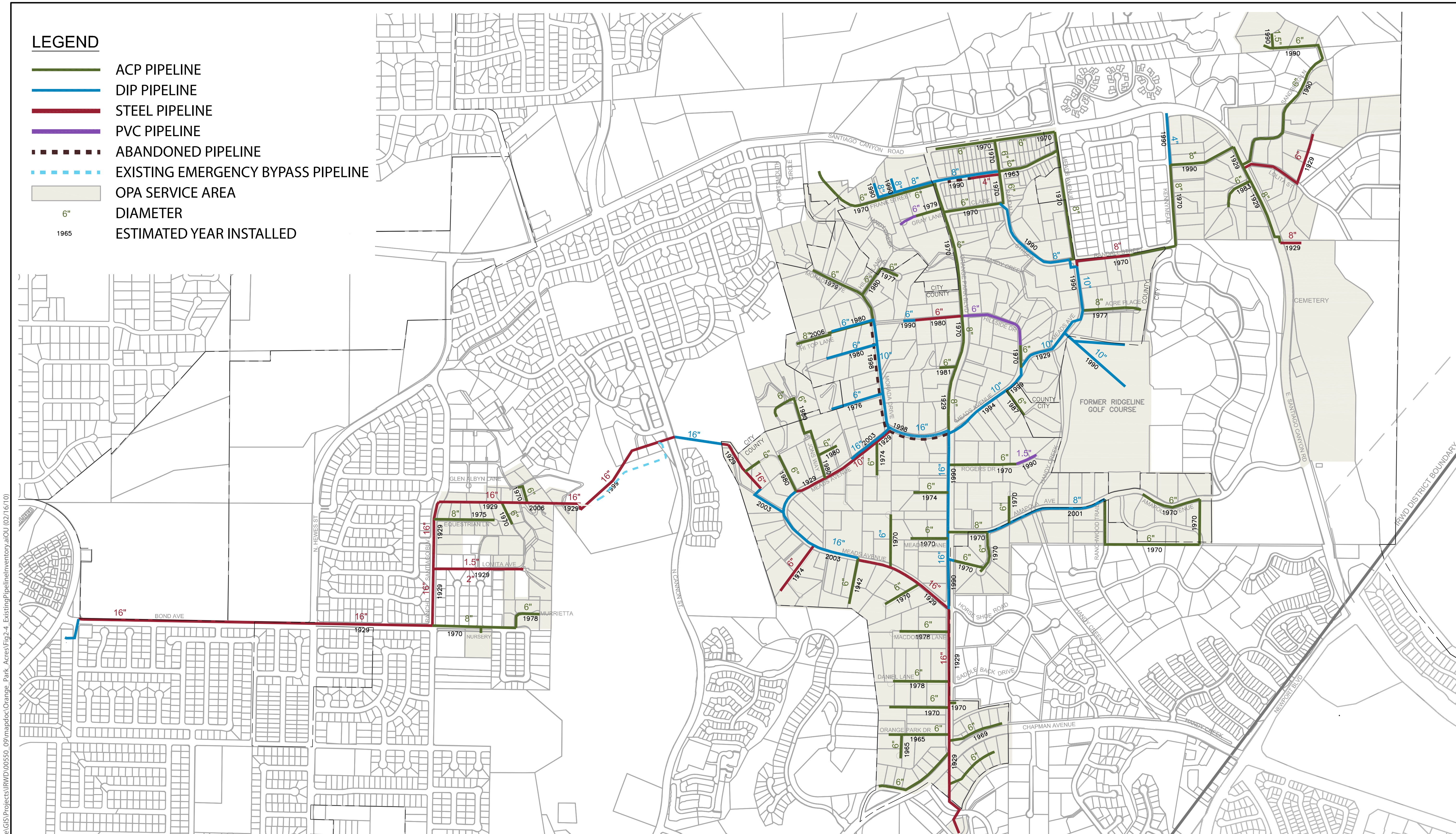
The EOCWD turnout, located adjacent to the OPA reservoir, consists of a buried meter vault that takes water from the EOCWD 12-inch line. Downstream of the meter is a Cla-Val vault that reduces pressure prior to discharging directly into the OPA reservoir. The EOCWD turnout is operated based on the levels in the OPA reservoir. When the water level within the OPA reservoir reaches a preset low level, the EOCWD turnout transfers water to the OPA reservoir; the EOCWD turnout ceases water supply to the OPA reservoir when it reaches a preset high level. The water level in the OPA reservoir is maintained at approximately 6 to 8 feet.

Transmission and Distribution Pipelines

The existing water distribution and transmission supply system consists of a 16-inch transmission main from the OPA well to the OPA reservoir. From the 16-inch transmission main, water is distributed through a pipeline network ranging in size from 16-inch to 1.5-inch diameter pipes. In several areas, the transmission main serves the dual purposes of transmission and distribution. As mentioned above, the pipeline distribution and transmission system is aging and has had a history of leaking problems, and is in need of upsizing to provide optimum service pressures, demand flows, and fire flows.

Figure 2-4 illustrates the inventory of the existing distribution and transmission system, with the diameter, material, and age of pipe shown. Pipe diameters and materials shown reflect many of the recent improvements and repairs that have been conducted by IRWD since the consolidation. A few portions of the existing transmission main have been recently replaced and are in good, serviceable condition. Locations and connections also reflect the latest pothole information as provided by IRWD (Stantec 2009a).

The existing 16-inch transmission main begins at the OPA well located near Gravier Street and Bond Avenue. The pipeline proceeds easterly along Bond Avenue to Rancho Santiago Boulevard, where it turns north. Proceeding north along Rancho Santiago Boulevard, the pipeline turns easterly into a private easement located about 200 feet north of Equestrian Lane. Continuing within this easement through backyards and private driveways, the pipeline enters an easement within the County of Orange's El Modena Open Space. The existing alignment follows the terrain along the side and down



Source: Stantec (2010)

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Figure 2-4
Existing Pipeline Inventory
Orange Park Acres - Domestic Water Distribution and Transmission System Improvements Project

a hill, again passing between existing residences from Glen Albyn Lane to Cannon Street near Patria Court.

The pipeline within the El Modena Open Space was in very poor condition, and in mid-2008, IRWD installed approximately 1,500 linear feet of aboveground emergency bypass pipeline for this area. The aboveground emergency bypass line runs through El Modena Open Space, portions of which lie within the reserve area of the Orange County Natural Community Conservation Plan/Habitat Conservation Plan (NCCP/HCP) Central/Coastal Subregion, Central Subarea. Installation and removal of this emergency bypass line resulted in temporary impacts on native habitats both within and outside the NCCP Reserve. A full mitigation monitoring and restoration plan was prepared by Harmsworth Associates detailing the actions necessary to mitigate for impacts on natural vegetation impacts incurred during installation and removal of the emergency bypass line. The restoration plan was approved by Nature Reserve of Orange County (NROC), County of Orange, and Wildlife Agencies. IRWD performed the restoration and monitoring work to mitigate for impacts sustained during installation of the emergency bypass line through the El Modena Open Space.

From Cannon Street, the pipeline then proceeds in an easterly direction up a hill, around a private residence, through several backyards, into a private driveway and eventually exits onto Meads Avenue below Jons Way. The OPA pipeline then proceeds southwesterly along Meads Avenue to Orange Park Boulevard where it turns south towards Chapman Avenue. Then it proceeds along Orange Park Boulevard, crossing Chapman Avenue, and continues to the OPA reservoir located near Calle Grande and Calle Baja, where it terminates at the OPA reservoir (Stantec 2009b).

Booster Stations

The existing domestic water distribution and transmission system has a hydraulic grade of 623 feet AMSL, and some service pad elevations in the OPA service area are in excess of 635 feet AMSL, requiring additional boosting stations. There are five hydropneumatic boosters that serve isolated portions of the OPA service area (Figure 2-3). Four of the booster pump stations are very small with 1- to 2-inch discharge and serve a few homes. However, none of the booster stations are able to provide adequate fire flow. The stations are listed in Table 2-1 below, with the estimated capacities and number of homes served.

Table 2-1. Existing Hydropneumatic Booster Pump Stations

Station Name	Location	No. of Pumps	Approx. Capacity (gpm)	By-Pass	Number of Services Connected
Kennymead	Kennymead at Randall	2	200 800	Yes	47
Orange Park	Orange Park Blvd. north of Chapman	1	20	No	5
Meads	Jons Way north of Meads Ave.	1	50	No	11
Hi Top	Hi Top east of Morada	1	50	Yes	6
Amapola	Amapola	2	50	No	10

Source: Stantec 2009a.

The majority of the existing homes in the upper elevations east of Morada Drive, Meads Avenue, and Orange Park Boulevard, which are not currently served by a hydropneumatic booster pump listed

above, have their own private booster pumps. In addition, there is one home at the end of Hi Top Lane, which despite being served by the Hi Top booster pump station has its own private pump because the station still does not provide adequate pressure to the home (Stantec 2009a).

Emergency Interconnections

There are three existing emergency interconnections to the City of Orange water distribution and transmission system, all of which are metered; however, these are not currently active. These interconnections are used in the event of an emergency, such as line breaks in which portions of the water distribution and transmission system are damaged or otherwise incapable of providing service, or natural catastrophes. These interconnections are located at Patria Court and Cannon Street, Kennymead Street and Randall Street, and near the OPA well (Figure 2-3). Each of these interconnections are normally closed and opened manually upon request to the City of Orange by IRWD (Stantec 2009a).

Interim Fire Protection Improvements

As previously discussed, fire protection is deficient in portions of the OPA service area. Subsequent to the consolidation, Stantec was hired to identify needs for improvement to the existing water system. Stantec's evaluation determined that fire protection was found to be lacking and in need of critical improvements, resulting in the preparation of an interim fire protection plan and followed by the construction of some of the improvements recommended in this plan by IRWD to provide additional fire protection until all of the proposed improvements to the domestic water system could be made. A Notice of Exemption was filed on May 15, 2009 to satisfy CEQA requirements for construction of these improvements, which in total were less than a mile in length along public street and rights-of-way. The following describes the current existing fire protection, including improvements constructed as recommended by the interim fire protection plan, for the east, west, and central service areas, respectively.

East Service Area

This area has been improved by IRWD with the installation of a permanent interconnection with the City of Orange at Santiago Canyon Road and Sandberg Lane and installation of a new 8-inch pipeline in Sandberg Lane and Angel View Terrace from Santiago Canyon Road to the last fire hydrants on these streets. All hydrants in the area meet fire flow requirements with at least 36 pounds per square inch of residual pressure (Stantec 2009a).

West Service Area

With the OPA well in operation, all hydrants in the area meet fire flow requirements with at least 20 pounds per square inch of residual pressure. No additional fire protection improvements are required or planned in this area (Stantec 2009a).

Central Service Area

Various improvements were installed as part of the Interim Fire Protection plan, including a temporary emergency pump station on Meads Avenue, additional piping, and permanent interconnections with the City of Orange. There are several areas still below 20 pounds per square inch of residual pressure, and additional improvements would be made as a part of the proposed project (Stantec 2009a).

Existing Telemetry

The existing OPA well and OPA reservoir are being temporarily monitored by Mission Communications, which is a web based analog communications provider. This system utilizes phone lines for communications, and does not include any antennas or other radio communications systems (Stantec 2009a).

Proposed Project

IRWD proposes a series of water distribution and transmission infrastructure improvements throughout the OPA service area to upgrade the facilities and improve service to its customers. The following discussion includes identification of the project objectives, description of proposed project facilities and operations, and construction activities and phasing.

Project Objectives

The major project objectives are to:

- Increase the reliability of the water service provided to residents by replacing failing portions of the existing OPA transmission main.
- Increase the hydraulic grade of the system in order to provide adequate water pressure for residential use and to meet fire flow requirements.
- Increase the water supply pressure and reliability by connecting to the IRWD Zone 5 (736 Hydraulic Grade Line [HGL]) potable system at Jamboree and Chapman.

Description of the Proposed Project

The proposed project involves a series of water distribution and transmission improvements throughout the OPA service area that will allow the system to operate at the higher Zone 5 (736 HGL) pressures. These improvements include upgrades to the OPA transmission main; new distribution lines; connection to the existing Zone 5 16 inch pipeline in Jamboree Road at Chapman Avenue; removal of the emergency bypass line; EOCWD turnout modifications; pressure reducing stations; installation of pressure regulators for individual service connections; demolition of the OPA reservoir and four booster pump stations; Meads Pump Station upgrades; bi-directional meters for the City of Orange interconnections; fire protection improvements; and telemetry capabilities. The proposed water facility improvements are shown in Figure 2-5. Details regarding each of the proposed project components are described below.

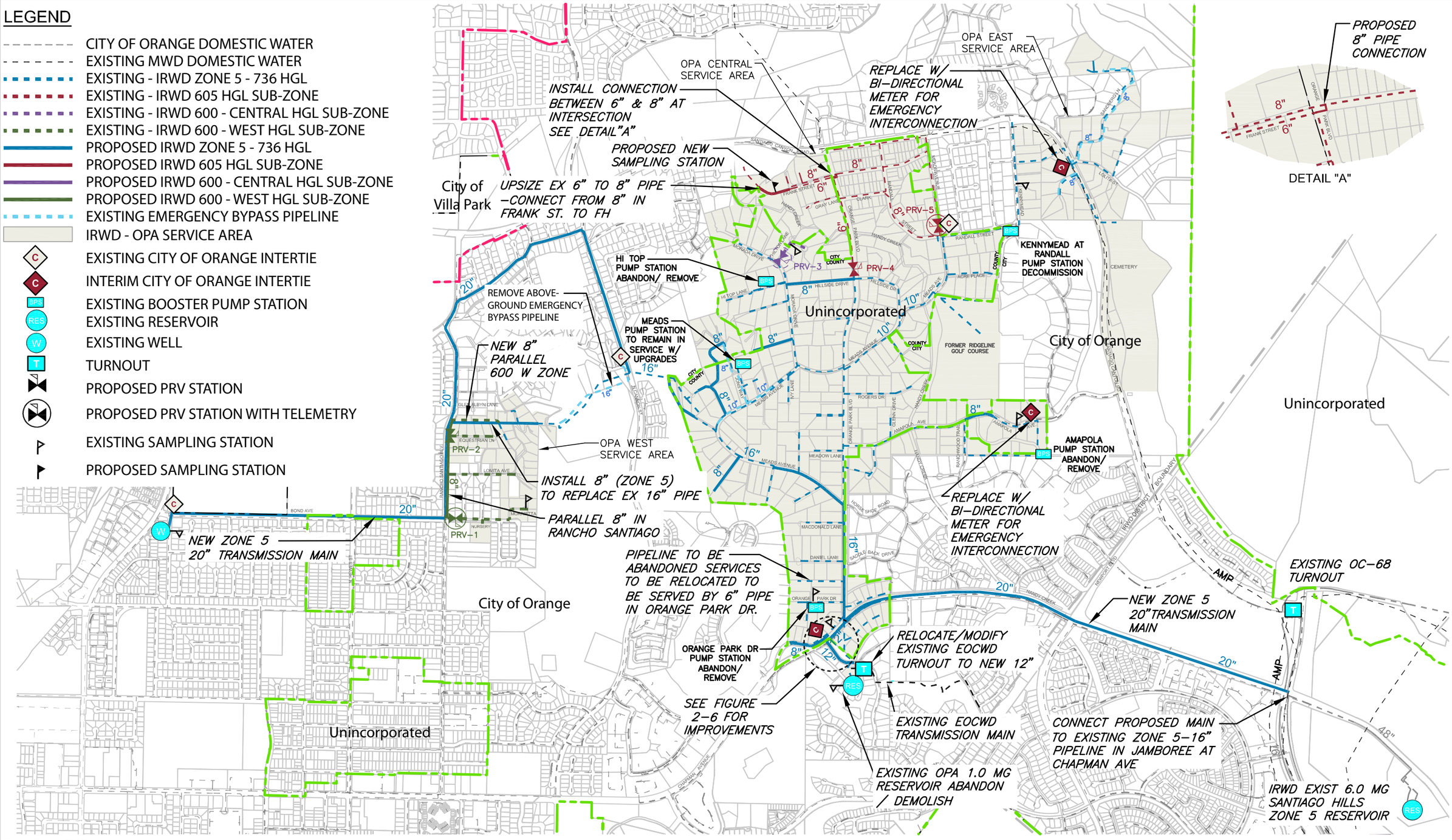
Transmission Main

The proposed project involves installation of a new transmission main for the OPA service area that would connect to the OPA well, OPA reservoir (interim connection until demolition of the OPA reservoir), EOCWD turnout, and the IRWD Zone 5 distribution system (Figure 2-5). The new distribution and transmission system would be operated at Zone 5 (736 HGL) pressures, with sub-pressure zones, both reduced and increased, as needed.

As identified in the SAMP, the recommended 20-inch-diameter transmission main is sized

LEGEND

- CITY OF ORANGE DOMESTIC WATER
- EXISTING MWD DOMESTIC WATER
- EXISTING - IRWD ZONE 5 - 736 HGL
- EXISTING - IRWD 605 HGL SUB-ZONE
- EXISTING - IRWD 600 - CENTRAL HGL SUB-ZONE
- EXISTING - IRWD 600 - WEST HGL SUB-ZONE
- PROPOSED IRWD ZONE 5 - 736 HGL
- PROPOSED IRWD 605 HGL SUB-ZONE
- PROPOSED IRWD 600 - CENTRAL HGL SUB-ZONE
- PROPOSED IRWD 600 - WEST HGL SUB-ZONE
- EXISTING EMERGENCY BYPASS PIPELINE
- IRWD - OPA SERVICE AREA
- EXISTING CITY OF ORANGE INTERTIE
- INTERIM CITY OF ORANGE INTERTIE
- EXISTING BOOSTER PUMP STATION
- EXISTING RESERVOIR
- EXISTING WELL
- TURNOUT
- PROPOSED PRV STATION
- PROPOSED PRV STATION WITH TELEMETRY
- EXISTING SAMPLING STATION
- PROPOSED SAMPLING STATION



Source: Stantec (2010)

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Figure 2-5
Proposed Domestic Water System Improvements
Orange Park Acres - Domestic Water Distribution and Transmission System Improvements Project

for OPA flows, plus future flows to serve the East Orange and Santiago Hills II planning areas, of which the combined maximum daily demand is estimated to be 3,870 gpm. The East Orange and Santiago Hills II planning areas have been separately addressed in an EIR prepared and adopted by the City of Orange in November 2005. Additionally, the new transmission main alignment will remove the existing transmission main loop around Meads Avenue and Orange Park Boulevard (the "loop" system shown in Figure 2-3), and in order to provide the needed conveyance capacity and hydraulic performance certain sections of pipe are sized for 20-inch diameter.

The new 20-inch transmission main is proposed beginning at the OPA well at Bond Avenue and Gravier Street and would extend the length of Bond Avenue to Rancho Santiago Boulevard, where it would turn north and extend the length of Rancho Santiago Boulevard to Hewes Street. The proposed main would then turn easterly into a proposed easement at Valencia. The main would then continue on Valencia, jog at North Linda Vista St, and realign with Valencia until it would turn south at Cannon Street. At the base of the hill near Cannon Street, the proposed transmission main would connect to an existing 16-inch transmission main, constructed in 1995, which heads east up the hill north of the residences on Rockhurst Drive and terminates at the top of the hill. From the top of the hill, the proposed 16-inch transmission main would connect to the existing transmission main and continue southeast where it would connect with another existing 16-inch transmission main, constructed in 2003, which extends southeast, adjacent to residences, and continues along a portion of Meads Avenue to Shetland Lane. Here, the proposed 16-inch transmission main would connect to the existing transmission main near Meads Avenue and Shetland Lane, continue southeast along Meads Avenue to Orange Park Boulevard, and then turn south along Orange Park Boulevard to Chapman Avenue. From this intersection, the proposed 16-inch transmission main would transition to the proposed 20-inch transmission main, extending east along Chapman Avenue to Jamboree Road. At the Chapman Avenue and Jamboree Road intersection, the proposed 20-inch transmission main would be connected to the existing IRWD Zone 5 pressure zone 16-inch transmission main and Santiago Hills Reservoir with a HGL of 736-feet.

The proposed transmission main is primarily aligned within street right-of-ways, and the pipeline would be buried entirely beneath the ground surface. Portions of the existing transmission main that are in good, serviceable condition would be retained and connected to the proposed transmission main. Additional pipeline appurtenances include air-vacuum valves, blowoffs, sampling stations, fire hydrants, cathotic test stations, isolation valves, connections and modifications to existing services and laterals, and realignment of distribution and meters in the Chapman/Orange Park Boulevard area. The pipelines that are being replaced would be abandoned in place per IRWD standards. Pipelines abandoned in place would be filled with concrete, soil, or another substance suitable for preventing collapse and then would be capped to prevent any hazard to the public.

Several possible permanent pipeline alignments were considered, including a replacement of the existing transmission main along its existing alignment through El Modena Open Space. The recommended alignment routes for the proposed transmission main are completely outside the El Modena Open Space in order to minimize the potential for environmental impacts during construction and for ongoing operations and maintenance. Therefore, once the existing emergency bypass line through the El Modena Open Space is removed and the existing underground transmission main is abandoned in place, no active water transmission facilities would be located within environmentally sensitive areas.

Removal of Emergency Bypass Line

The existing aboveground emergency bypass line through El Modena Open Space would be removed once the proposed transmission main is placed into service (Figures 2-3 and 2-5). The existing underground transmission main in this area would be abandoned in place by plugging with concrete or another solid substance to prevent collapse. As discussed above, IRWD performed restoration work to mitigate impacts sustained during installation of the emergency bypass line through the El Modena Open Space, in accordance with the mitigation monitoring and restoration plan prepared by Harmsworth Associates. All activities related to removal of the emergency bypass line will also be mitigated and monitored as specified in the mitigation monitoring and restoration plan prepared by Harmsworth Associates. See Section 3(IV) and the Santiago Waterline Restoration Plan (Appendix A) for a full discussion of impacts, mitigation, and monitoring activities related to installation and removal of the emergency bypass line.

EOCWD Turnout Modifications

The existing EOCWD turnout is being relocated and modified to be an emergency connection as part of the proposed project. The modifications include relocating the Cla-Val, meter, and valves adjacent to the existing OPA reservoir site, and adding air and vacuum releases, vents, and water sampling stations (see Figure 2-6). New locations are being considered and included within the existing site or at alternative locations on adjacent properties.

Pressure Reducing Stations

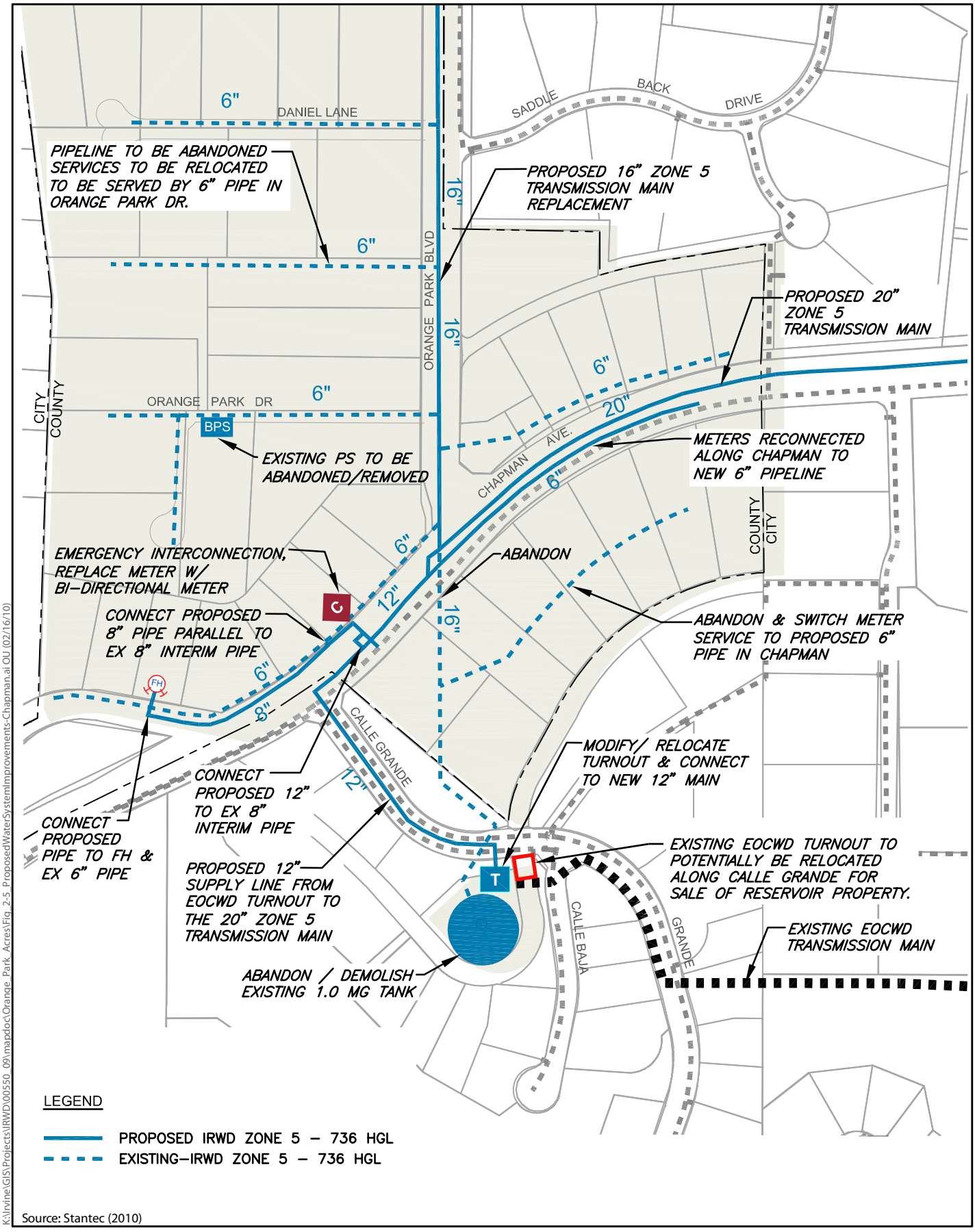
The pressure reducing stations, except where otherwise noted, will consists of below ground vaults containing pressure reducing valves and monitoring devices, buried valves, air-vacuum valves, vents, telemetry and power cabinets, and radio antenna. Where technically feasible, the pipeline appurtenances will be constructed with flush mounted enclosures.

East Service Area

No pumping or regulating valve facilities other than those already constructed for the interim conditions are proposed for the east service area. Individual pressure regulators would also be installed in accordance with the Uniform Plumbing Code on service connections having pressures greater than 80 pounds per square inch.

West Service Area

Within the west service area, two pressure reducing stations (PRVs) are proposed to serve a sub-zone with an HGL of 600 feet. As shown in Figure 2-5, PRV-1 would be connected to the existing 8-inch pipeline in Bond Avenue, east of Rancho Santiago. PRV-2 would require a new 8-inch parallel line connected to the new 20-inch Zone 5 pipeline and would extend from Rancho Santiago and Bond to north of Equestrian Lane. This pipeline would connect the proposed PRVs to the pipelines in Lomita, Equestrian, and the Old Rancho Santiago driveway north of Equestrian Lane. PRV-1 and PRV-2 would be hydraulically connected by the new 8-inch parallel pipeline (Stantec 2009a). The west service area hydraulic conditions for PRV-1 and PRV-2 are shown in Table 2-2. Individual pressure regulators would also be installed in accordance with the Uniform Plumbing Code on service connections having pressures greater than 80 pounds per square inch (psi).



Source: Stantec (2010)

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Figure 2-6
Proposed Domestic Water System Improvements – Chapman Area
Orange Park Acres - Domestic Water Distribution and Transmission System Improvements Project

Table 2-2. West Service Area Proposed Pressure Reducing Stations

Valve	Location	Maximum Flow (gpm)	Upstream Pressure (psi)	Downstream Pressure (psi)	Jurisdiction	Ownership
PRV-1	Bond Ave east of Rancho Santiago	1,535	180	118	City of Orange	Private
PRV-2	Rancho Santiago at Equestrian Lane	1,535	170	110	City of Orange	Private

Central Service Area

Pressure reducing stations would be added at three locations to create two subpressure zones of 600 HGL and 605 HGL. The pressure reducing stations and hydraulic conditions are listed in Table 2-3. Individual pressure regulators would also be installed in accordance with the Uniform Plumbing Code on service connections having pressures greater than 80 psi.

Table 2-3. Central Service Area Proposed Pressure Reducing Stations

Valve	Location	Maximum Flow (gpm)	Upstream Pressure (psi)	Downstream Pressure (psi)	Jurisdiction	Ownership
PRV-3	Hilton Lane north of Morada	1,506	111	52	County of Orange	County of Orange
PRV-4	Orange Park Blvd north of Hillside Drive	2,160	115	58	County of Orange	County of Orange
PRV-5	Meads Ave north of Randall Street	2,160	120	64	County of Orange	County of Orange

Temporary Pressure Reducing Station in Chapman

This station will be constructed above ground on or adjacent to City of Orange right-of-way. The station will not be provided with power or telemetry. This station will be used initially during conversion to the higher Zone 5 pressures. Incrementally increasing pressures can help prevent pressure surges and pipe breaks. The City of Orange and IRWD staff are in the process of siting this station along Chapman Avenue, between Orange Park Boulevard and Jamboree Road.

Storage Tank Demolition

Once the proposed transmission main is placed into service, the existing 1.0 MG OPA reservoir at Calle Grande Street would be abandoned by removing the connections to the OPA transmission main and the EOCWD turnout (Figure 2-5 and 2-6). The tank and EOCWD turnout facilities would be demolished, all materials would be removed, and the site would be graded to match the surrounding terrain.

Booster Pump Stations

Once the proposed transmission main is placed into service, four existing booster pump stations would no longer be required: Kennymead, Orange Park, Hi Top, and Amapola. These existing booster pump stations (Figures 2-3 and 2-5) would be disconnected from distribution mains and removed.

The existing Meads Pump Station along Jons Way would be upgraded as a part of the proposed project. The upgrades include a new pump station pad; site grading; fencing; skid mounted enclosed pumps, hydropneumatic tank, and controls; meter and valves; electrical and telemetry panels; communication antenna; enclosure; and tree removal. The proposed locations are at the existing site or along the west side of the alley.

Bi-Directional Meters for Existing Emergency Interconnections

For the three existing interconnections within the City of Orange, bi-directional meters would be installed as a part of this project. By agreement with the City, the proposed two-way flow connections would provide emergency water supplies to and from the City (Stantec 2009a).

Fire Protection Improvements

The east and west service areas are not in need of additional fire protection improvements; therefore, there are no improvements proposed as part of this project for these areas. As discussed above under Existing Conditions, the Central Service Area was identified as needing additional fire protection. Within the Central Service Area, the following fire protection improvements are to be made:

- 8-inch pipe upsizing in Frank Street, west of Orange Park Boulevard.
- 8-inch pipe connection at Frank Street and Orange Park Boulevard.
- 8-inch pipe construction in Hillside Drive.
- 8-inch pipe upsizing in private drive near Morada Drive, north of Meads.
- 8-inch pipe connection in Jons Way.
- 8-inch pipe upsizing in private drive near Meads, between Vickie Lane and Shetland Lane.
- 8-inch pipe connection in Chapman Avenue, west of Orange Park Boulevard.

Telemetry Improvements

Telemetry facilities would be required for the Meads Pump Station, three PRVs, and a data collection site located at a City of Orange Reservoir. Telemetry for the other two PRVs, EOCWD turnout (emergency connection), and the City of Orange emergency interconnections are considered optional and may also be added as part of the proposed project. Figure 2-7 shows the proposed and optional telemetry improvements throughout the proposed project area. At the Meads Pump Station, the radio antenna would be mounted on the pump station building at the roof line or alternatively on a 20-foot-high taper steel pole. Each of the three PRVs would have a 10-foot-high

LEGEND

- IRWD–OPA SERVICE AREA
- EXISTING CITY OF ORANGE INTERTIE
- INTERIM CITY OF ORANGE INTERTIE
- EXISTING BOOSTER PUMP STATION
- EXISTING RESERVOIR
- EXISTING WELL
- TURNOUT
- PROPOSED PRV STATION
- PROPOSED PRV STATION WITH TELEMETRY
- PROPOSED RADIO COMMUNICATIONS FACILITY

OPA CENTRAL SERVICE AREA

OPA EAST SERVICE AREA

OPA WEST SERVICE AREA

PROPOSED RADIO COMMUNICATION FACILITY

PROPOSED RADIO COMMUNICATION FACILITY

PROPOSED RADIO COMMUNICATION FACILITY

PROPOSED RADIO COMMUNICATION FACILITY

PROPOSED RADIO COMMUNICATION FACILITY

PRV–1

PRV–2

PRV–3

PRV–4

PRV–5

OPTIONAL

OPTIONAL

OPTIONAL

EXISTING OPA 1.0 MG RESERVOIR ABANDON / DEMOLISH

EXISTING EOCWD RESERVOIR

EXISTING OC–68 TURNOUT

IRWD EXIST 6.0 MG SANTIAGO HILLS ZONE 5 RESERVOIR

FORMER RIDGELINE GOLF COURSE

CEMETERY

AMP

AMP

48"

Source: Stantec (2010)

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ICF INTERNATIONAL

Figure 2-7
Proposed Telemetry Improvements
Orange Park Acres - Domestic Water Distribution and Transmission System Improvements Project

mono pole mounted on the side of the electrical panel box. Radio signals from Meads Pump Station and the three PRVs would be sent to the data collection site, which would then convey the signals to the existing IRWD telemetry network. Table 2-4 describes the data collection site and associated system elements that would likely be needed for the proposed project.

Table 2-4. Preliminary Data Collection Site Needs

Communication Element	Description
One mast	40- to 45-foot tapered steel pole
Three antennas	19 dB Yagi, 12-inch x 18-inch flat panel type, omni for AMI
Three radios	900 MHz receiver, 900 MHz transmitter, for AMI
Power needs	15 amp circuit for Radios, PLC, Power supply and battery charger
Two cabinets	24 inches x 36 inches for IRWD SCADA, 36 inches x 36 inches for AMI

Each telemetry facility would send telemetry signals to the data collection site via a spread spectrum radio system. The data collection site and alternative data collection sites have been identified and include City of Orange Reservoir Tank No. 10A, one possible alternative data collection site located at the Golden State Water Company Reservoir, and another possible alternative data collection site located at the City of Orange Water Reservoir No. 8 (see Figure 2-8). Data would then be relayed to the Michelson Water Reclamation Plant (MWRP) Operations Center via an existing radio communications system at IRWD's Santiago Zone 5 Reservoir. There are currently no IRWD communication facilities within these sites. Thus, the proposed telemetry improvements would require coordination with the respective property owners for use of their site.

The data collection site would require a 40- to 45-foot tapered steel pole. The City of Orange's existing antenna at Reservoir Tank No. 10A is mounted on the top of the above-ground reservoir and is similar in height to the proposed steel pole. At the request of the City of Orange, the steel mast for the proposed data collection site is being designed as a free-standing tapered steel pole and would not be mounted on the reservoir.

To the extent possible, telemetry/communications equipment will be mounted to reduce the visual clutter along city roadways. IRWD will work with the City of Orange to use screening and setback techniques where feasible.

Proposed Easements

IRWD, as the successor in interest to OPAMWC, has blanket easements over substantial portions of the OPA service area. There are several areas where the existing water lines are located on private properties within these blanket easements. The proposed distribution and transmission system and related appurtenances would be located within portions of the City of Orange and the County of Orange, and the majority of the new facilities would be located almost entirely within existing dedicated street rights-of-way. A new easement is required to route the pipeline along the top of the hill northeast of Rockhurst Drive. Additional easements are proposed for the relocated EOCWD turnout, relocated Meads Pump Station, PRV facilities, and data collection sites (radios). Both permanent easements and temporary construction easements are anticipated and would be acquired as needed from the affected property owners.

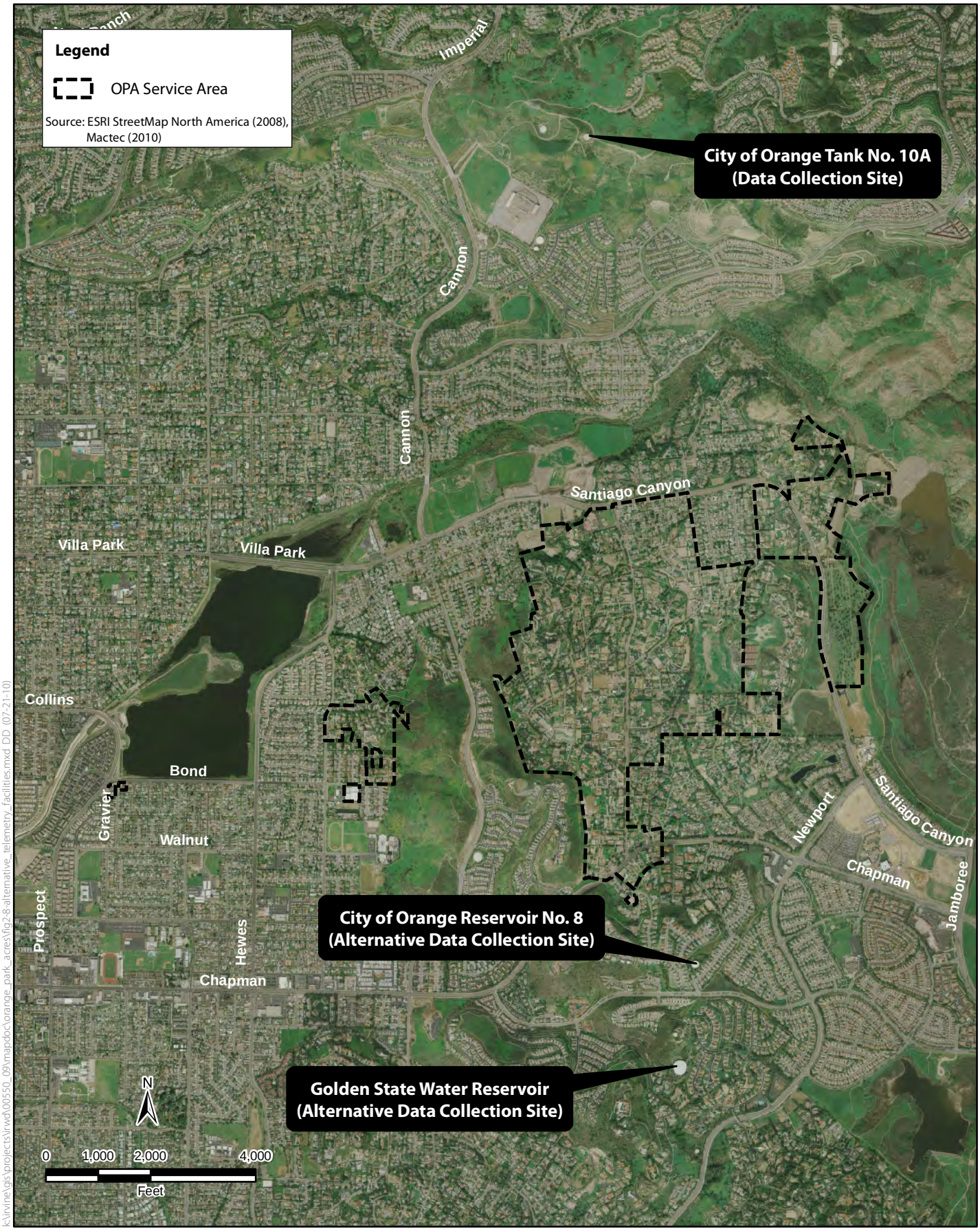

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Figure 2-8
Alternative Data Collection Sites
Orange Park Acres - Domestic Water Distribution and Transmission System Improvements Project

Proposed Permits

In addition to the existing approval and permits required from NROC, County of Orange, and wildlife agencies related to the removal of the emergency bypass line, the following additional permits are being requested.

City of Orange

Construction of the proposed transmission main within City of Orange public rights-of-way would require encroachment permits and site plan approvals. In order to procure an encroachment permit, traffic control plans are included in the construction plans. The City of Orange will not issue an encroachment permit until verifying that construction plans comply with all City standards. Demolition of the OPA reservoir may require a demolition permit from the City of Orange Community Development Department and a grading permit from the Public Works Department. In addition, a transportation and/or dirt hauling permit may be required in the event that City streets are used for hauling materials or if construction activities will require the use of oversized vehicles. The City of Orange will review construction plans before making final determination on permits required for these activities.

County of Orange

The OPA service area is situated primarily within the jurisdiction of the County of Orange. In order to procure an encroachment permit, traffic control plans are included in the construction plans.

Regional Water Quality Control Board

If groundwater is encountered, dewatering may be required. IRWD has a current permit from the Regional Water Quality Control Board (RWQCB) allowing IRWD and its contractors to discharge groundwater resulting from construction projects (Order No.R8-2006-0065, NPDES No. CAG998002).

Proposed Project Phasing

The phasing for the OPA service area distribution and transmission system improvements has been established based on construction sequencing relative to the upgrade of the transmission main. It is anticipated that construction activities for the proposed improvements would begin in mid-2010 and would continue for approximately 2 years as part of separate, overlapping construction contracts. Domestic service to existing customers would be maintained, with the exception of short-term outages needed for construction activities. Construction activities are split up into three discrete phases with another set of future phases following completion of the first three phases. The estimated construction schedule for each phase is described in Table 2-5.

- **Phase 1:** This phase is the initial phase to construct the Transmission Main from the existing OPA well to the point of connection at Jamboree Road and Chapman Avenue.
- **Phase 2:** Consists of the mechanical facilities required to operate the new Transmission Main and convert the system to the Zone 5 HGL.
- **Phase 3:** Facilities proposed for this phase are required to upgrade the existing system to meet current fire protection standards.

- **Future Phases:** Activities associated with future phases include removal of the aboveground emergency bypass line, storage tank demolition, and booster pump stations disconnection.

Table 2-5. Proposed Project Construction Phasing

Activity	2010		2011				2012	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Phase 1								
Phase 2								
Phase 3								
Future Phases							Through 2013 →	

Specific construction activities associated with each phase are described below. The order in which specific activities associated with each phase would be constructed would be determined by the construction contractor, and would not necessarily occur in the order in which they are described.

Phase 1

Phase 1 would be constructed from September 2010 through October 2011 and would include transmission main installation, pressure reducing station installation, and construction of the temporary pressure reducing station in Chapman. As stated in the Orange Park Acres Sub Area Master Plan, specific facilities associated with this phase include:

- 16-inch and 20-inch transmission main.
- 8-inch pipeline in Rancho Santiago Boulevard.
- PRV-1 and PRV-2 in Rancho Santiago Boulevard.
- One 6-inch and one 4-inch slip lined pipe in Old Rancho Santiago Alley up to last fire hydrant.
- 8-inch pipeline in Jons Way including reconnecting services.
- 12-inch pipeline in Calle Grande and Chapman Avenue.
- 6-inch pipeline in Chapman Avenue including reconnecting services.
- Temporary PRV in Chapman Avenue.
- Install individual PRs at each meter.
- Additional piping and valves to connect services and laterals.

Phase 2

Phase 2 would be constructed from December 2010 through August 2011 and would include EOCWD turnout modifications, bi-directional meters installation, and telemetry improvements. As stated in the Orange Park Acres Sub Area Master Plan, specific facilities associated with this phase include:

- Meads pump station upgrades.
- Bi-directional meter and other appurtenances as necessary at Chapman, Amapola, and Sandberg Interconnections.

- Relocate/modify EOCWD turnout and connect to new 12-inch pipe in Calle Grande.
- PRV-3 in Hilton Drive, PRV-4 in Orange Park Blvd, and PRV-5 in Meads Avenue.

Phase 3

Phase 3 would be constructed from May 2011 through August 2011 and would include fire protection improvements. As stated in the Orange Park Acres Sub Area Master Plan, specific facilities associated with this phase include:

- 8-inch pipe replacement in private drives in Morada and Meads.
- 8-inch pipe in Hillside Drive.
- 8-inch pipe in Amapola.
- 8-inch pipe replacement in Chapman.
- 8-inch pipe replacement in Frank Street.
- 8-inch pipe connection at Frank St and Orange Park Boulevard.
- Additional piping and valves to connect services and laterals.

Future Phases

Future phases would occur after completion of all other project components, between 2012 and 2013. Activities associated with these phases include removal of the aboveground emergency bypass line, storage tank demolition, and booster pump stations disconnection.

Construction-Generated Noise Controls

The City of Orange and County of Orange limit noise generated by construction activities on Mondays through Saturdays from 7 a.m. to 8 p.m., and do not allow any noise to be generated by construction work on Sunday or federal holidays (City of Orange Municipal Code 2009 and Orange County Municipal Code, 1975). Construction contractors working in portions of the OPA Service Area that are subject to the jurisdiction of the City of Orange would adhere to the traffic control standards identified within the Work Area Traffic Control Handbook (WATCH). Construction contractors working in County areas would adhere to traffic control standards identified within the Manual on Uniform Traffic Control Devices (MUTCD) (Stantec 2009b).

Discretionary Actions and Approvals

Under CEQA, the IRWD has the primary discretionary authority over the approval of the proposed project. The anticipated discretionary approvals required for IRWD to implement the proposed project include the following:

- Adoption of the MND.
- Adoption of a mitigation monitoring and reporting program.
- Design and construction of the project.

Other public agencies may also have discretionary authority over the project, or aspects of the project, and are considered responsible agencies. The IS/MND can be used by the responsible

agencies to comply with CEQA in connection with permitting or approval authority over the project. The following approvals may also be required to implement the proposed project:

- Santa Ana Regional Water Quality Control Board (RWQCB):
    - National Pollutant Discharge Elimination System (NPDES) general construction permit (for individual construction projects of a particular size or projects that result in point source discharges).
- City of Orange:
    - Encroachment permits are required from the City of Orange Department of Public Works for construction within roadway rights-of-way within city limits.
    - Transportation permits are required from the City of Orange Department of Public Works for construction projects within roadway rights-of-way and on all vehicles exceeding the limits of a legal load as defined by the California Vehicle Code, Transportation permits are also required when moving more than 500 cubic yards of material or if moving materials on public roadways not designated as approved City truck routes, as identified in the City of Orange Grading Manual.
    - Dirt hauling permits are required from the City of Orange Department of Public Works when moving more than 500 cubic yards of material or if moving materials on public roadways not designated as approved City truck routes, as identified in the City of Orange Grading Manual.
    - Grading permits are required from the City of Orange Department of Public Works for excavations on residentially zoned property moving more than 50 cubic yards of soil or when onsite drainage is proposed to be modified when compared to existing conditions.
    - Site plan approvals are required from the City of Orange for all aboveground installations outside of street rights-of-way and within city limits.
- County of Orange:
    - Encroachment permits are required from the County of Orange for construction within roadway rights-of-way outside of city limits.
    - Encroachment and construction permits are required from Orange County Parks.
- Nature Reserve of Orange County:
    - NROC requires review of mitigation and restoration plans covering all activities within the NCCP/HCP reserve system.

Chapter 3
Environmental Checklist

1.	Project Title:	Orange Park Acres Domestic Water Distribution and Transmission System Improvements
2.	Lead Agency Name and Address:	Irvine Ranch Water District (IRWD)
3.	Contact Person and Phone Number:	Christian Kessler 949-453-5441
4.	Project Location:	The proposed project would be located in portions of the City of Orange and unincorporated portions of the County of Orange, CA. The proposed project site is bounded by Gravier Street on the west, Santiago Canyon Road on the north, Jamboree Road on the east, and Chapman Avenue on the south. Chapter 2 provides additional details regarding the project location.
5.	Project Sponsor's Name and Address:	IRWD 15600 Sand Canyon Avenue Irvine, CA 92618
6.	General Plan Designation:	Low Density Residential, Public Facilities, Open Space, Open Space Park, Open Space Ridgeline, Low Medium Residential, Estate Low Density Residential, Rural Estate Density Residential; Suburban Residential;
7.	Zoning:	R1-6, R1-7 R1-8, R1-10, R1-12, R1-15, R1-20, R1-40, R2-6, R2-7, R2-8, R-3, RO, SH, FP, PI; C1; C2; R2D; R4; R1; R2; 70-R1
8.	Description of Project:	Chapter 2 provides additional details regarding the project description.
9.	Surrounding Land Uses and Setting:	Chapter 2 provides additional details regarding the surrounding land uses and setting.
10.	Other Public Agencies Whose Approval is Required:	Santa Ana Regional Water Quality Control Board (SARWQCB), City of Orange, Nature Reserve of Orange County, County of Orange

Environmental Factors Potentially Affected

The environmental factors checked below would potentially be affected by this project (i.e., the project would involve at least one impact that is a "Potentially Significant Impact"), as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Agriculture and Forest Resources	☐ Air Quality
☐ Biological Resources	☐ Cultural Resources	☐ Geology/Soils
☐ Greenhouse Gas Emissions	☐ Hazards and Hazardous Materials	☐ Hydrology/Water Quality
☐ Land Use/Planning	☐ Mineral Resources	☐ Noise
☐ Population/Housing	☐ Public Services	☐ Recreation
☐ Transportation/Traffic	☐ Utilities/Service Systems	☐ Mandatory Findings of Significance

Determination

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions to the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have an impact on the environment that is "potentially significant" or "potentially significant unless mitigated" but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards and (2) has been addressed by mitigation measures based on the earlier analysis, as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the project, nothing further is required.

Signature	Date
Printed Name	For

Evaluation of Environmental Impacts

1. A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained if it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
2. All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
3. Once the lead agency has determined that a particular physical impact may occur, the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an Environmental Impact Report (EIR) is required.
4. "Negative Declaration: Less than Significant with Mitigation Incorporated" applies when the incorporation of mitigation measures has reduced an effect from a "Potentially Significant Impact" to a "Less-than-Significant Impact." The lead agency must describe the mitigation measures and briefly explain how they reduce the effect to a less-than-significant level. (Mitigation measures from Section XVII, "Earlier Analyses," may be cross-referenced.)
5. Earlier analyses may be used if, pursuant to tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration [Section 15063(c)(3)(D)]. In this case, a brief discussion should identify the following:
   a. Earlier Analysis Used. Identify and state where earlier analyses are available for review.
   b. Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards and state whether such effects were addressed by mitigation measures based on the earlier analysis.
   c. Mitigation Measures. For effects that are "Less than Significant with Mitigation Incorporated," describe the mitigation measures that were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.
6. Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, when appropriate, include a reference to the page or pages where the statement is substantiated.
7. Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.
8. This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.
9. The explanation of each issue should identify:
   a. the significance criteria or threshold, if any, used to evaluate each question; and
   b. the mitigation measure identified, if any, to reduce the impact to a less-than-significant level.

I. Aesthetics		Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:					
a.	Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b.	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings along a scenic highway?	☐	☐	☐	☒
c.	Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☒	☐	☐
d.	Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?	☐	☐	☐	☒

Discussion

Would the project:

a. Have a substantial adverse effect on a scenic vista?

Less-than-Significant Impact. In general, the proposed project area is characterized by moderately undulating topography, and is interspersed with tracts of low-rise residential buildings. Distant views from many locations within the vicinity of the proposed project are limited by the surrounding hills, except for locations at higher elevations. Within the vicinity of the proposed project, major landforms include the steep hills to the west and south, Santiago Creek to the north and east, and Rattlesnake Peak to the north (J.L. Webb Planning 1973). The Orange County General Plan Transportation Element identifies viewscape corridors within the vicinity of the project area starting at Peters Canyon Regional Park along Newport Avenue to Weir Canyon Road (County of Orange 2004). One viewscape corridor is within 1 mile of the proposed project's southern border near the intersection of Newport Boulevard and Chapman Avenue. This viewscape corridor continues from Santiago Canyon Road to the southeast of the project area. The other viewscape corridor is also within 1 mile of the proposed project's southeastern border along Jamboree Road. The City of Orange General Plan EIR also identifies the same viewscape corridor along Chapman Avenue between Newport Boulevard and Santiago Canyon Road. The City of Orange General Plan EIR also identifies the Santiago Oaks Regional Park and the El Modena Open Space area as scenic resources (City of Orange 2009).

Replacement of the OPA transmission main would require the use of heavy construction equipment for trenching and placement of new pipeline below ground surface primarily in public streets. This equipment would be in use for only a short period of time at any single location and would not substantially interfere with any view corridors or scenic vistas. Following construction, and removal of construction equipment, the proposed project elements would not be visible.

Demolition of the OPA reservoir at Calle Grande Street would occur within approximately 0.8 mile of the Newport Avenue viewscape corridor, and would involve heavy construction equipment to deconstruct the facility and remove all materials from the site, followed by the use of equipment to grade the site to match the surrounding terrain. As is the case with other project elements, activities

related to demolition of the reservoir would be temporary, and would not substantially impede views of scenic resources because hilly terrain blocks views of this area.

Telemetry improvements would include the installation of antennas and related communications appurtenances at three of the five PRVs, the Meads Pump Station, and the proposed data collection site at the City of Orange Reservoir Tank No. 10A. Each of the PRVs would have a 10-foot-high mono pole mounted on the side of the electrical panel boxes. The Meads Pump Station would have an antenna mounted at the roofline of the pump station building or alternatively on a 20-foot-high taper steel pole. The data collection site would have a 40- to 45-foot-high freestanding tapered steel pole. The existing antenna at the City's Reservoir Tank No. 10A is mounted on the top of the above-ground reservoir. The proposed 40- to 45-foot tapered steel pole would be similar in size and height to the existing antenna at the City's Reservoir Tank No. 10A, and the alternative data collection sites would not significantly contribute to the height and massing of these facilities and are not located in areas that would obstruct views of scenic vistas. Antennas at the PRVs and Meads Pump Station are typically found installed along most roadways are shorter in height than street light poles, and would not be placed in locations that would obstruct views of scenic vistas. Furthermore, where technically feasible, pipeline and telemetry appurtenances would be constructed within flush mounted enclosures to reduce visual impact at the ground level.

Removal of the emergency bypass line through the El Modena Open Space area would occur once the new transmission main is placed into service, requiring the use of some heavy equipment at higher elevations near the ridgelines. These areas are designated by the City of Orange as Open Space Park and Open Space Ridgelines, designations established to preserve public lands used for passive and active recreation and visually significant ridgelines. However, removal of the emergency bypass line would require only temporary use of equipment in these areas for a short duration, and would not visually impair scenic views once removal of the emergency bypass line is complete. Furthermore, the affected areas would be restored to match the existing natural habitat once removal of the emergency bypass line is complete.

No other components of the proposed project would have the potential to adversely affect any scenic vistas from on-site or off-site pedestrian and vehicular locations; no large structures that would impact scenic vistas are proposed as part of the proposed project. Furthermore, operation of the proposed project would involve components that are either entirely underground or would be the same as existing conditions. Impacts would be less than significant.

b. Substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings along a scenic highway?

No Impact. There are no officially designated state scenic highways in the vicinity of the proposed project (Caltrans 2009). No impact would occur.

c. Substantially degrade the existing visual character or quality of the site and its surroundings?

Less-than-Significant Impact with Mitigation Incorporated. Although construction of several proposed project elements would involve earthwork and removal and resurfacing of street pavement, a majority of the proposed project elements would be placed below the ground surface. Although construction activities would require the placement of construction equipment along roadways, these activities would be temporary for the duration of construction. When construction is complete, existing pavement that has been damaged or removed would be repaved according to the requirements of the City of Orange and County of Orange. Typically, any lane affected by trench

construction would need to be ground and capped at least 1 foot outside the trench limits and resealed between lane striping (Stantec 2009a). Furthermore, as part of the project design and where technically feasible, equipment within the City of Orange right-of-way would be accommodated within flush mounted enclosures, and to the extent possible, telemetry/communications equipment will be mounted on existing City-approved poles or structures to reduce the visual clutter along City roadways. IRWD will work with the City to use screening and setback techniques where feasible on all above-ground installations, including the temporary PRV.

Removal of the emergency bypass line would involve the use of construction equipment in areas within and surrounding the NCCP/HCP Reserve. Once removal of the emergency bypass line is complete, the natural habitat would be restored to its existing state with the implementation of biological mitigation measures **MM BIO-7** and **MM BIO-9** (see IV-a and IV-f) and the visual character of the existing environment would not be permanently degraded.

Demolition of the OPA reservoir would involve the use of construction equipment in the vicinity of the reservoir for the duration of demolition activities. The site would be graded to match the surrounding terrain once demolition is complete and all above-ground equipment would be removed from the site.

In total there are five PRVs that would be constructed as part of the proposed project. The PRVs would be located mostly underground and accessed via removable manhole or utility covers, and may include aboveground air vacuums and vents. Aboveground air vacuums and vents would be housed within cylindrical containers approximately 2 feet in diameter and 3 feet in height. Two PRVs would be located within the west service area: one at Bond Avenue east of Rancho Santiago and the second at Rancho Santiago at Equestrian Lane. The remaining three PRVs would be located in the central service area: one at Hilton Lane north of Morada, another at Orange Park Boulevard north of Hillside Drive, and the third at Meads Avenue north of Randall Street. One additional temporary PRV will be located above ground; however, impacts are considered minimal as this PRV would only be in place temporarily and would not include a telemetry component. The five permanent PRVs would require additional underground pipeline connections, and an individual pressure regulator would be installed in accordance with the Uniform Plumbing Code on service connection having pressures greater than 80 psi. In addition, as depicted on Figure 2-5 and discussed above, three of the five PRVs would include telemetry facilities. As mentioned above, the only visible components would be manhole or utility covers and cylindrical containers approximately 2 feet in diameter and 3 feet in height. These components are low profile and are typically found installed along most roadways. Because these appurtenances are commonplace, they are generally inconspicuous and imperceptible.

The proposed project would also include an upgrade to the Meads Pump Station along Jons Way that would consist of the following: a new pump station pad; site grading; skid mounted enclosed pumps, hydropneumatic tank, and controls; meter and valves; electrical and telemetry panels; and communication antenna. This pump station would be enclosed within an 8-foot chain-link fence with slats for screening, similar to existing pump stations within the vicinity.

Additionally, the existing EOCWD turnout would be relocated to the southwest corner of Calle Grande and Calle Baja and modified to be an emergency connection (see Figure 2-6). A Cla-Val, meter, valves, and the addition of vacuum releases, vents, and water sampling stations would be required for these modifications. The majority of these components would be located belowground;

however, some aboveground components may be required and could include cylindrical containers approximately 2 feet in diameter and 3 feet in height or aboveground pipelines and valves extending approximately 3 feet in height, 2 feet in width, and 8 feet in length. IRWD has held initial discussions with the neighborhood homeowners association which has indicated a preference to not screen any aboveground appurtenances at this location.

Four existing booster pump stations would be removed as part of the proposed project; these would be disconnected from distribution mains and removed. Visual impacts from construction activities related to their removal would be temporary, and upon removal, the area would be cleared of any aboveground mechanical equipment, fences, and other appurtenances so that the station sites would match the surrounding environment.

Operation of the proposed project would involve components that are either entirely underground, would match existing conditions, or would be comprised of appurtenances that are regularly found alongside roadways. The existing visual character of the proposed project area and its surroundings would not be substantially degraded during construction or operation of the proposed project. Impacts would be less than significant.

d. Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?

No Impact. Construction activities related to the proposed project would be limited to daytime construction hours, and would not result in additional nighttime light over existing conditions. Construction and operation of the proposed project would not result in the addition of materials or equipment that would cause daytime or nighttime glare. Operation of all other proposed project components would be located underground and would not require lighting. The proposed project would not introduce new sources of light or glare to the proposed project area. No impact would occur.

II. Agriculture and Forest Resources	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
In determining whether impacts on agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b. Conflict with existing zoning for agricultural use or conflict with a Williamson Act contract?	☐	☐	☐	☒
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d. Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

Discussion

Would the project:

a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

No Impact. According to the California Department of Conservation *Orange County Important Farmland 2008* report, the proposed project site is classified as "urban and built-up land" and "other land," which do not contain any agricultural uses (DLRP 2009). The proposed project does not have the potential to convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural uses. No impact would occur.

b. Conflict with existing zoning for agricultural use or conflict with a Williamson Act contract?

No Impact. No agricultural land uses and no property under Williamson Act contract exist in the vicinity of the proposed project. The proposed project would not conflict with existing zoning for agricultural use or a Williamson Act contract. No impact would occur.

c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?

No Impact. No land zoned as forest land or timberland exists within the proposed project boundaries (CDFFP 2003). The proposed project would not conflict with existing zoning for forest land or timberland. No impact would occur.

d. Result in the loss of forest land or conversion of forest land to non-forest use?

No Impact. As discussed in II-c, no land zoned as forest land or timberland exists within the proposed project boundaries (CDFFP 2003). The proposed project would not conflict with existing zoning for forest land or timberland. No impact would occur.

e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?

No Impact. No agricultural land uses, forest land, or timberland exist in the vicinity of the proposed project and the proposed project would not involve other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland to non-agricultural use or forest land to non-forest use. No impact would occur.

III. Air Quality	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
When available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a. Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d. Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e. Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

Discussion

Would the project:

a. Conflict with or obstruct implementation of the applicable air quality plan?

No Impact. The proposed project is located within the South Coast Air Basin (Basin). The South Coast Air Quality Management District (SCAQMD) is required, pursuant to the Federal Clean Air Act, to reduce emissions of criteria pollutants for which the Basin is in nonattainment (i.e., O_3, PM10 and PM2.5). As such, the proposed project would be subject to the SCAQMD's Air Quality Management Plan (AQMP). The AQMP contains a comprehensive list of pollution control strategies directed at reducing emissions and achieving ambient air quality standards. These strategies are developed, in part, using regional population, housing, and employment projections prepared by the Southern California Association of Governments (SCAG).

SCAG is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties, and addresses regional issues relating to transportation, economy, community development, and environment. With regard to air quality planning, SCAG has prepared the Regional Comprehensive Plan and Guide (RCPG), which includes Growth Management and Regional Mobility chapters that form the basis for the land use and transportation control portions of the AQMP. These documents are utilized in the preparation of the air quality forecasts and consistency analysis included in the AQMP. Both the RCPG and AQMP are based, in part, on projections originating with County and City general plans.

The proposed project would involve replacement and installation of domestic water supply systems to increase the reliability of the water service and enhance fire protection for service area residents by replacing failing portions of the existing system. The proposed project would not result in either

an increase in population or the number of new permanent employees in the area that would affect growth. Furthermore, the proposed project would be largely maintenance free and similar to existing conditions, thereby resulting in non–net-increase employment in the region. The proposed project is consistent with both the County of Orange General Plan and City of Orange General Plan designation and zoning.

Because the proposed project is consistent with the local general plan and the regional growth management plan, pursuant to SCAQMD guidelines, the proposed project is considered consistent with the region's AQMP. No impact would occur.

b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Less-than-Significant Impact. As discussed in III-a, the proposed project site is located within the Basin. State and federal air quality standards are often exceeded in many parts of the Basin. A discussion of the proposed project's potential short-term construction-period and long-term operational-period air quality impacts is provided here.

Regional Construction Impacts

The SCAQMD has established methodologies to quantify air emissions associated with construction activities such as air pollutant emissions generated by operation of onsite construction equipment; fugitive dust emissions–related trenching and earthwork activities; and mobile (tailpipe) emissions from construction worker vehicles and haul/delivery truck trips. Emissions would vary from day to day, depending on the level of activity, the specific type of construction activity occurring, and, for fugitive dust, prevailing weather conditions.

Construction activities for the proposed project are expected to occur in three main phases. Phase 1 is the initial phase to construct the Zone 5 Transmission Main from the existing well to the point of connection at Jamboree Road and Chapman Avenue. Phase 2 consists of the mechanical facilities required to operate the new Zone 5 Transmission Main and convert the system to the Zone 5 HGL. Phase 3 involves the installation of facilities required to upgrade the existing system to meet current fire protection standards.

A construction-period mass emissions inventory was compiled based on an estimate of construction equipment as well as scheduling and phasing assumptions. More specifically, the mass emissions analysis takes into account the following:

- Combustion emissions from operating on-site construction equipment.
- Fugitive dust emissions from the placement of fill material.
- Mobile-source combustion emissions from worker commute travel.

For the purpose of estimating emissions associated with construction activities, the following timeframes were assumed for each of the three phases: Phase 1 would occur from September 2010 through October 2011; Phase 2 would occur from December 2010 through August 2011; Phase 3 would occur from May 2011 through August 2011. Emissions were calculated using the URBEMIS 2007 emissions inventory model. Table 3-1 shows that based on a conservative estimate of the proposed project's regional mass emissions during construction, all criteria pollutant emissions would be below their respective thresholds (detailed calculations and URBEMIS worksheets are provided in Appendix B). Impacts from construction would therefore be less than significant.

Table 3-1. Forecast of Regional Construction Emissions

	Criteria Pollutant Emissions (pounds per day)					
Construction Phase	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Phase 1	4	33	15	<1	2	2
Phase 2	1	10	5	<1	1	1
Phase 3	5	49	20	<1	2	2
Maximum Concurrent Regional Project Emissions[a]	10	92	40	<1	5	5
SCAQMD Regional Emissions Threshold (pounds/day)	75	100	550	150	150	55
Exceed Threshold?	No	No	No	No	No	No

[a] Maximum concurrent regional emissions occur during the months of May through August 2011 when all three phases occur simultaneously.
URBEMIS 2007 outputs are provided in Appendix B.

Localized Construction Impacts

When quantifying mass emissions for localized analysis, only emissions that occur on site are considered. Consistent with SCAQMD Localized Significance Threshold (LST) methodology guidelines, emissions related to offsite delivery/haul truck activity and employee trips are not considered in the evaluation of localized impacts. As shown in Table 3-2, localized emissions for all criteria pollutants would remain below their respective SCAQMD LST significance threshold (detailed calculations and URBEMIS worksheets are provided in Appendix B). Localized impacts that might result from construction-period air pollutant emissions would therefore be less than significant.

Table 3-2. Forecast of Localized Construction Emissions

	Criteria Pollutant Emissions (pounds per day)					
Construction Phase	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Phase 1	3.22	28.15	11.27	<0.01	1.89	1.31
Phase 2	1.37	10.86	5.40	<0.01	0.62	0.57
Phase 3	4.54	48.42	17.37	<0.01	2.35	1.80
Worst Case On-Site Total	5	48	17	<1	2	2
SCAQMD Localized Significance Threshold (pounds/day)[a]	--	183	1,253	--	13	7
Exceed Threshold?	No	No	No	No	No	No

[a] These localized thresholds were taken from tables provided in the SCAQMD Localized Significance Thresholds Methodology guidance document based on the following: 1) The proposed project site is located in SCAQMD Source Receptor Area No. 17, 2) sensitive receptors located within 25 meters of construction activity, and 3) the maximum site area disturbed is 5 acres.
URBEMIS 2007 outputs are provided in Appendix B.

Regional and Localized Operations Impacts

Operations associated with the proposed project generally include pipeline and facility maintenance activities and are expected to be similar to or less than existing conditions. Because the proposed project would require very little maintenance once construction is completed and only on an as-needed basis, emissions generated once operational would be minimal and the impact would be less than significant.

c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?

Less-than-Significant Impact. The SCAQMD's approach for assessing cumulative impacts is based on the AQMP forecasts of attainment of ambient air quality standards in accordance with the requirements of the Federal and State Clean Air Acts. As discussed in III-a, the proposed project is consistent with the AQMP, which is intended to bring the Basin into attainment for all criteria pollutants.[1] In addition, the mass regional emissions calculated for the proposed project (Table 3-1, Forecast of Regional Construction Emissions) are lower than the applicable SCAQMD daily significance thresholds that are designed to assist the region in attaining the applicable state and national ambient air quality standards. Cumulative impacts would be less than significant.

d. Expose sensitive receptors to substantial pollutant concentrations?

Less-than-Significant Impact. As described in III-b, construction of the proposed project would not result in any substantial localized or regional air pollution impacts and therefore would not expose any nearby sensitive receptors to substantial pollutant concentrations. Impacts related to substantial pollutant concentrations would be less than significant.

e. Create objectionable odors affecting a substantial number of people?

Less-than-Significant Impact. According to the SCAQMD *CEQA Air Quality Handbook* (SCAQMD 1993), land uses associated with odor complaints typically include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. The proposed project does not include any uses identified by the SCAQMD as being associated with odors and therefore would not produce objectionable odors. Impacts related to objectionable odors would be less than significant.

Potential sources that might emit odors during proposed project construction activities include asphalt paving. SCAQMD Rule 1108 limits the amount of volatile organic compounds from cutback asphalt. Through mandatory compliance with SCAQMD Rules, no construction activities or materials are proposed that would create a significant level of objectionable odors. Construction impacts related to objectionable odors would be less than significant.

[1] CEQA Guidelines Section 15064(h)(3) states "A lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program which provides specific requirements that will avoid or substantially lessen the cumulative problem (e.g. water quality control plan, air quality plan, integrated waste management plan) within the geographic area in which the project is located. Such plans or programs must be specified in law or adopted by the public agency with jurisdiction over the affected resources through a public review process to implement, interpret, or make specific the law enforced or administered by the public agency."

IV. Biological Resources	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a. Have a substantial adverse 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?	☐	☒	☐	☐
b. 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?	☐	☒	☐	☐
c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marshes, vernal pools, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d. 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?	☐	☐	☐	☒
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f. Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?	☐	☒	☐	☐

Discussion

Would the project:

a. Have a substantial adverse 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?

Less-than-Significant Impact with Mitigation Incorporated. The proposed project area has the potential to support 8 special-status wildlife species and 5 special-status plant species. Four areas within the project site support natural vegetation communities and have the potential to support special-status species: vegetation in the vicinity of the emergency bypass line, OPA reservoir, OPA transmission main (near Rockhurst Drive), and the remainder of the OPA transmission main within existing roadways (Figure 3-1). Each of these areas, and the respective resources and impacts, is discussed separately below.

As depicted in Figure 3-1, the proposed project would be located within portions of the NCCP/HCP Central/Coastal Subregion, Central Subarea, with one of three designations: NCCP/HCP Reserve, NCCP/HCP Existing Use, and NCCP/HCP Non-Reserve, which includes all areas outside of the other two designations. A portion of the emergency bypass line is located within the NCCP/HCP Reserve. The portion of the OPA transmission main east of Canon Street (near Rockhurst Drive) would be constructed within the NCCP/HCP Existing Use area. The remainder of the proposed project is located within the NCCP/HCP Non-Reserve. In addition, a portion of the emergency bypass line is located within the County of Orange El Modena Open Space. The Santiago Waterline Restoration Plan, provided as Appendix C, includes additional details regarding the existing conditions and impacts to biological resources applicable within the NCCP/HCP as a result of the proposed project (Harmsworth 2008, ICF 2010).

Emergency Bypass Line

A portion of the emergency bypass line is located within the County of Orange El Modena Open Space and also within portions of the NCCP/HCP Reserve and NCCP/HCP Non-Reserve areas (Figure 3-1). Removal of the emergency bypass line is expected to result in impacts on vegetation similar to those identified for the installation of the emergency bypass line in the Santiago Waterline Restoration Plan prepared by Harmsworth Associates (Harmsworth 2008). Impacts within the NCCP/HCP Reserve would total approximately 0.3 acre of natural communities: 0.25 acre of Coastal Sage Scrub (CSS) (0.07 acre of CSS, 0.18 acre of sparse CSS), and 0.05 acre of cactus scrub (Harmsworth 2008). Impacts within the NCCP/HCP Non-Reserve area would total approximately 0.42 acre: 0.25 acre of CSS (0.08 acre of CSS, 0.17 acre sparse CSS), 0.05 acre of cactus scrub, 0.11 acre of nonnative grassland (NNG), 0.01 of county trail, and some landscaped areas (Harmsworth 2008).

The habitat located within the footprint of the emergency bypass line is occupied by the following species, observed during surveys: coastal California gnatcatcher (*Polioptila californica californica*) (CAGN), a federally listed endangered species; coastal cactus wren (*Campylorhynchus brunneicapillus sandiegenensis*), a California Species of Concern; and intermediate mariposa lily (*Calochortus weedii* var. *intermedius*), a California Native Plant Society (CNPS) 1B.2 status species (Harmsworth 2008). The southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), a non-status species listed in the NCCP, and the following California species of special concern also have potential to occur: northern red-diamond rattlesnake (*Crotalus ruber ruber*), coast patch-nosed snake (*Salvadora hexalepis virgultea*), and orangethroat whiptail (*Aspidoscelis hyperythra*), (Appendix C). Special-status plant species with potential to occur are Allen's pentachaeta (*Pentachaeta aurea* ssp. *allenii*) (1B.1), chaparral sand-verbena (*Abronia villosa* var. *aurita*) (1B.1), many-stemmed dudleya (*Dudleya multicaulis*) (1B.2), and peninsula nolina (*Nolina cismontana*) (1B.2). (Appendix C).

The removal of the emergency bypass line has the potential to result in direct impacts on these species. Direct impacts on CAGN would be a significant impact because it constitutes *take* under the Endangered Species Act. Direct impacts on coastal cactus wren, southern California rufous-crowned sparrow, coast patch-nosed snake, orangethroat whiptail, and northern red-diamond rattlesnake were determined to not be potentially significant. Because the size of the affected area is small, it is unlikely that the proposed project would result in adverse impacts on the local populations of these species. Direct impacts on intermediate mariposa lily, Allen's pentachaeta, chaparral sand-verbena, many-stemmed dudleya, and peninsula nolina would be a potentially significant impact if a population of these species were permanently removed.

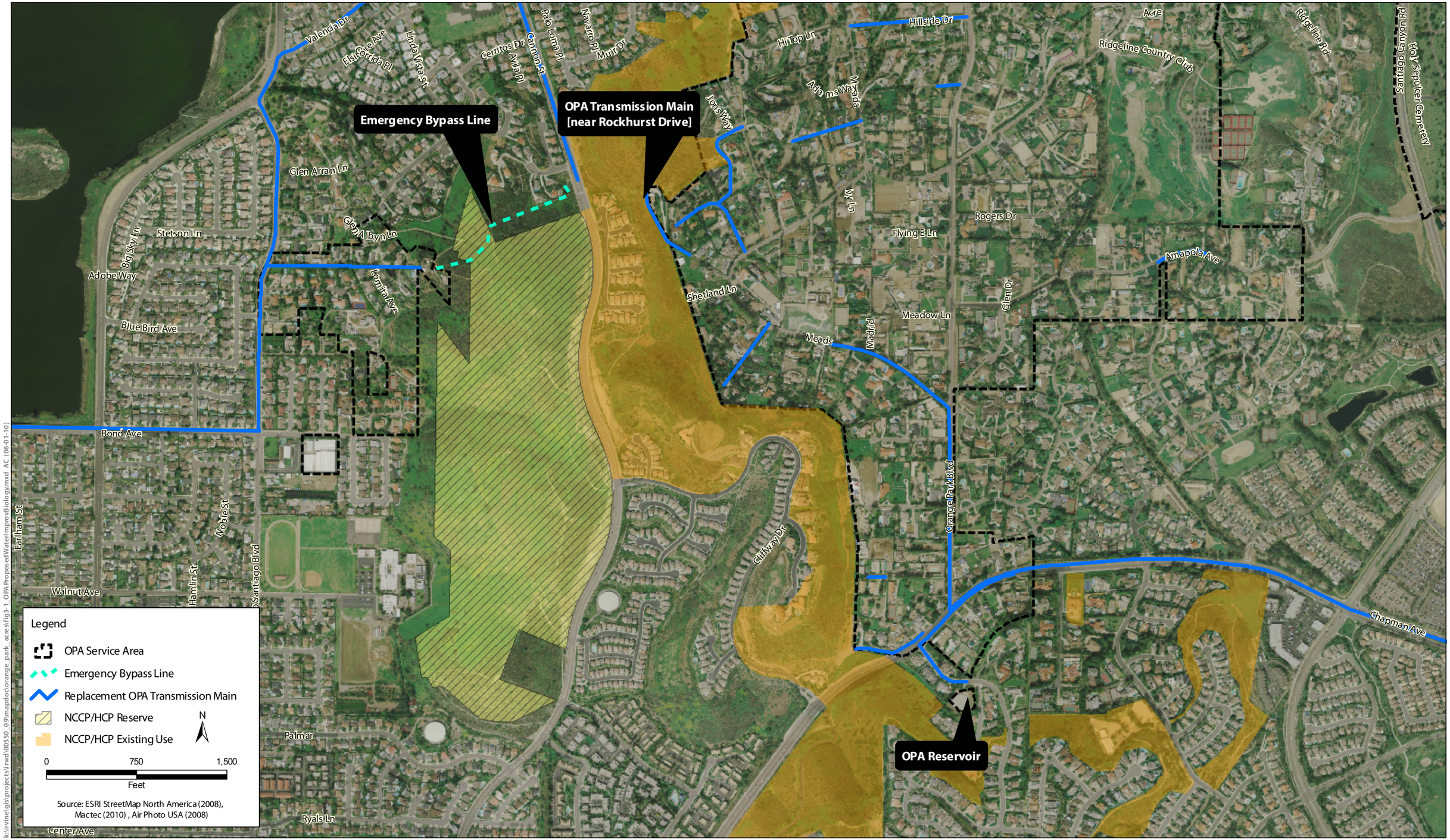

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Figure 3-1
NCCP / HCP Central / Coastal Subregion, Central Subarea
Orange Park Acres – Domestic Water Distribution and Transmission System Improvements Project

The removal of the emergency bypass line has the potential to result in temporary impacts on 0.5 acre of coastal sage scrub habitat and 0.1 acre of cactus scrub habitat, which would be a potentially significant indirect impact on CAGN. The removal of this habitat has the potential to have a significant impact on coastal cactus wren and southern California rufous-crowned sparrow if the habitat is removed during the nesting season. Removal of this habitat would not have a significant impact on coast patch-nosed snake and northern red-diamond rattlesnake because individuals of these species could move to suitable habitat that is available immediately adjacent to the proposed project.

Removal of the emergency bypass line has the potential to result in indirect impacts on special-status species as a result of construction-related noise and disturbance. Indirect impacts on CAGN, coastal cactus wren, and southern California rufous-crowned sparrow would be significant if impacts occur during the breeding season. Indirect impacts on northern red-diamond rattlesnake, coast patch-nosed snake, and orangethroat whiptail would be less than significant because individuals of these species could move to suitable habitat that is available immediately adjacent to the proposed project.

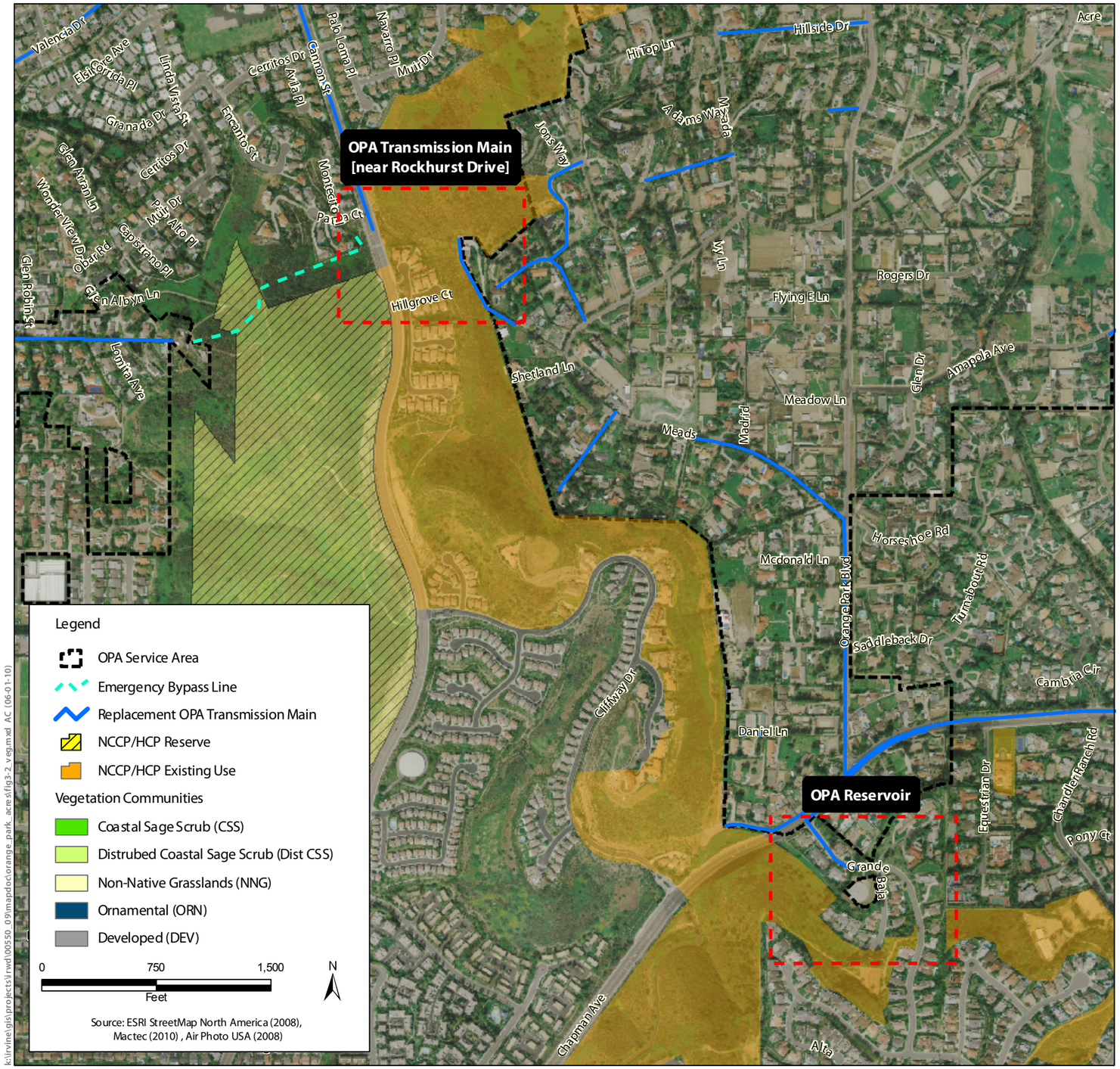
Impacts resulting from the emergency bypass line on CAGN, coastal cactus wren, southern California rufous-crowned sparrow, northern red-diamond rattlesnake, coast patch-nosed snake, orangethroat whiptail, intermediate mariposa lily, and habitat of these species are covered by the NCCP/HCP. Compliance with the NCCP/HCP would result in less-than-significant impacts on special-status species, including direct and indirect impacts. Compliance with the NCCP/HCP is discussed in IV-f. No additional mitigation is required. Mitigation Measures (MM) **BIO-1**, **MM BIO-2**, **MM BIO-3**, **MM BIO-4**, and **MM BIO-7** would reduce impacts on special-status species not covered by the NCCP/HCP (cactus wren, Allen's pentachaeta, chaparral sand-verbena, many-stemmed dudleya, and peninsula nolina) to less than significant levels.

OPA Transmission Main (Near Rockhurst Drive)

The OPA transmission main (Near Rockhurst Drive) study area is located within the NCCP/HCP Existing Use area. Direct impacts related to installation of the OPA transmission main would involve crushing of vegetation by machinery (back-hoes), and clearing of vegetation for trenching. An area 15 feet wide would be affected for the length of the transmission main outside of existing roadways in this area. Staging and equipment storage would occur within developed or unvegetated areas. Access for construction activities would occur from Cannon Street or from a private driveway.

Vegetation communities within the footprint of the OPA transmission main consist of CSS and NNG, and provide habitat for the following special-status species: CAGN, coastal cactus wren, southern California rufous-crowned sparrow, coast patch-nosed snake, northern red-diamond snake, intermediate mariposa lily, Allen's pentachaeta, chaparral sand-verbena, many-stemmed dudleya, and peninsula nolina (Figure 3-2).

Installation of the transmission main has the potential to result in direct impacts on these species. Direct impacts on CAGN, if present, would be a significant impact because it constitutes *take* under the Endangered Species Act. Direct impacts on coastal cactus wren, southern California rufous-crowned sparrow, coast patch-nosed snake, orangethroat whiptail, and northern red-diamond



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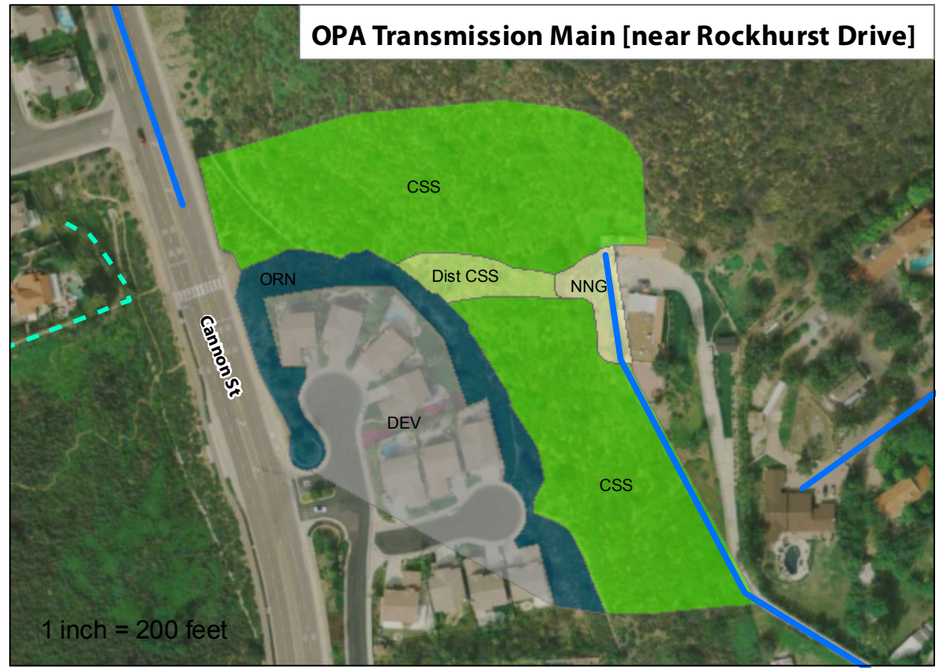

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Figure 3-2
Vegetation Communities
Orange Park Acres – Domestic Water Distribution and Transmission System Improvements Project

rattlesnake were determined to not be potentially significant. Due to the small size of the affected area, it is unlikely that the project would result in adverse affects to the local population of these species. Direct impacts on intermediate mariposa lily, Allen's pentachaeta, chaparral sand-verbena, many-stemmed dudleya, and peninsula nolina would be a potentially significant impact if a population of these species would be permanently removed. Removal of this habitat would not have a significant impact on coast patch-nosed snake, orangethroat whiptail, and northern red-diamond rattlesnake because individuals of these species could move to suitable habitat that is available immediately adjacent to the proposed project.

Installation of the transmission main would also result in removal of 0.18 acre of vegetation (0.05 acre of CSS and 0.13 acre of NNG), which would be a potentially significant indirect impact on CAGN. The removal of this habitat has the potential to have a significant impact on coastal cactus wren and southern California rufous-crowned sparrow if the habitat is removed during the nesting season. Removal of this habitat would not have a significant impact on coast patch-nosed snake, orangethroat whiptail, and northern red-diamond rattlesnake because individuals of these species could move to suitable habitat that is available immediately adjacent to the proposed project.

Installation of the transmission main near Rockhurst Drive has the potential to result in indirect impacts as a result of construction-related noise and disturbance. Impacts on CAGN and coastal cactus wren would be significant if they occur during the breeding season. Impacts on southern California rufous-crowned sparrow, northern red-diamond rattlesnake, coast patch-nosed snake, and orangethroat whiptail would be less than significant because individuals of these species could move to suitable habitat that is available immediately adjacent to the proposed project. **MM BIO-1**, **MM BIO-2, MM BIO-3, MM BIO-4, MM BIO-7, and MM BIO-8** would reduce impacts on special-status s species to a less-than-significant level.

OPA Reservoir and EOCWD Turnout

No direct impacts on special-status species or their habitat would occur during demolition of the reservoir because all activities would occur in a developed area devoid of native vegetation (Figure 3-2). If construction occurs during the nesting season, demolition of the reservoir has the potential to result in temporary indirect impacts on nesting birds and roosting bats in the grassland and ornamental areas surrounding the reservoir as a result of construction-related noise and disturbance. Relocation of the EOCWD Turnout (see Figure 2-6) would require the removal of a small number of eucalyptus trees, which may result in direct or indirect impacts on birds nesting in the trees that would be removed. **MM BIO-2, MM BIO-3, MM BIO-4, MM BIO-5, and MM BIO-6** would result in less-than-significant impacts on western mastiff bats, pallid bats, and nesting birds from demolition activities in the vicinity of the reservoir and the removal of eucalyptus trees associated with relocation of the EOCWD Turnout.

OPA Transmission Main

Replacement of the OPA transmission main within roadway rights-of-way would result in temporary indirect impacts on western mastiff bats, pallid bats and nesting birds in areas with ornamental trees, shrubs, and grassland due to noise and disturbance occurring along the roads that might provide suitable habitat for pallid bats and nesting birds (Figure 3-2). Impacts on special-status species resulting from installation of the replacement OPA transmission main would be reduced to a less-than-significant level with implementation of **MM BIO-1**, **MM BIO-2, MM BIO-3, and MM BIO-7**.

Mitigation Measure BIO-1: Conduct pre-construction surveys. All vegetation removal related to the proposed project will be conducted, if possible, outside of the bird nesting season, which extends from spring into late summer (February 15 through July 15). If vegetation removal takes place during the nesting season, a general pre-construction survey will be conducted prior to any ground-disturbing activities within or directly adjacent to natural plant communities to document any nesting birds in the work area. Surveys will be performed a maximum of 7 days prior to construction activities by a qualified biologist knowledgeable about the bird species that have the potential to occur in the work area. Any active bird nests, if discovered during the pre-construction surveys, will be marked by the qualified biologist with a no-work buffer. The size of the buffer will be determined by the qualified biologist and will be dependent on the species, but may be up to 250 feet for nesting song birds and up to 500 feet for raptors. The buffer will remain in place until the qualified biologist has determined that nesting activity is complete and the nests are no longer being used by the birds.

Mitigation Measure BIO-2: Conduct pre-construction biological resources awareness field training for construction workers. A qualified biologist familiar with the sensitive species that have the potential to occur in the project area will prepare and present a brief biological resources "tailgate" training in the field for construction personnel prior to initiation of ground-disturbing activities. The training will provide educational information on sensitive habitats of the special-status species potentially occurring in the study area, a discussion of required mitigation measures to avoid impacts on the special-status species, including identification of areas that are staked off so that disturbance is avoided, and a discussion of penalties for noncompliance with biological mitigation requirements. If new construction personnel are added to the project later, the contractor will ensure that new personnel receive tailgate training before they begin work.

Mitigation Measure BIO-3: Minimize Indirect Impacts. During construction activities, best management practices (BMPs) will be implemented to reduce potential indirect effects to special-status species and habitat. BMPs will include the following:

- Impact areas within naturally vegetated areas (coastal sage scrub and nonnative grassland) will be flagged. Workers will be informed that impacts are not to occur beyond the limits of flagging. Within the OPA reservoir work area, impacts will be limited to the developed area.
- All trash will be properly stored.
- Vehicles and equipment will be stored only in pre-designated staging areas in disturbed or developed areas.
- Dust control measures will be implemented to minimize the settling of dust on vegetation.
- Trenches deeper than 5 feet will be covered or filled in at the end of the day to avoid entrapment of special-status species.
- All construction will be performed between dawn and dusk to the degree feasible to minimize potential indirect effects (e.g., increased depredation) on the species beyond the limits of disturbance.

Mitigation Measure BIO-4: Revegetation. Natural vegetation communities (coastal sage scrub and nonnative grassland) that are disturbed by the project will be returned to pre-project conditions. For areas of nonnative grassland, native species will be used in place of the nonnative species present prior to construction. A revegetation plan will be developed prior to project implementation

and submitted to the County for approval. The plan will include seed collection and/or salvage of native species, salvage of topsoil where appropriate, planting palette, and a monitoring program.

Mitigation Measure BIO-5: Bat Surveys. Prior to construction activities, all trees within 30 feet of the activity area will be surveyed for bats and cavities. If cavities are identified in any of these trees that are too deep to visually survey, an evening bat survey shall be completed to determine whether the cavity is used by bats. A 30-foot buffer will be established around trees where bats are present.

Mitigation Measure BIO-6: Tree Removal. Prior to tree removal, all trees to be removed and all trees within 30 feet of the removal activity will be surveyed for bats and cavities. If cavities are identified in any of these trees that are too deep to visually survey, an evening bat survey shall be completed to determine whether the cavity is used by bats. If bats are present in the trees planned for removal, no tree removal will occur during the breeding season (April to mid-August). Prior to tree removal, bat boxes will be installed.

Mitigation Measure BIO-7: **Biological Monitor.** During initial ground disturbance activities within or directly adjacent to natural vegetation communities, a qualified biological monitor will be present to make certain that impacts on habitats are minimized and that measures in the approved CEQA document are followed. The monitor will have experience with the sensitive species on which impacts are to be avoided/minimized (i.e., CAGN). Monitoring will also occur periodically throughout the project site as deemed to be necessary by the biological monitor to oversee compliance with BMPs relevant to biological resources.

Mitigation Measure BIO-8: All work within or directly adjacent to natural vegetation communities will be conducted in accordance with NCCP construction-related minimization measures, Section 7.5.3 of the NCCP/HCP Part III Joint Programmatic EIR/EIS (County of Orange 1996). These construction-related minimization measures are designed to avoid impacts on California gnatcatcher and coastal sage scrub species, and include:

- All grading work will be conducted outside the bird nesting season (the bird nesting season is from February 15–July 15).
- The work area will be flagged.
- A monitoring biologist will notify USFWS/DFG at least 7 days in advance of clearing of CSS and will be on site during all ground-clearing work related to construction activity to flush identified species immediately prior to brush clearing.
- Following the completion of initial grading/earth movement activities, all areas of CSS habitat to be avoided by construction equipment and personnel will be marked with temporary fencing or other appropriate markers clearly visible to construction personnel. No construction access, parking, or storage of equipment or materials will be permitted within such marked areas.
- Vehicle transportation routes between cut-and-fill locations will be restricted to a minimum consistent with project construction requirements. Waste dirt or rubble will not be deposited on adjacent CSS identified in the NCCP/HCP for protection. Pre-construction meetings involving the monitoring biologist, construction supervisors and equipment operators will be conducted and documented to ensure maximum practicable adherence to these measures.
- CSS identified in the NCCP/HCP for protection and located within the likely dust drift radius of construction areas shall be periodically sprayed with water to reduce accumulated dust on the leaves as recommended by the monitoring biologist.

In addition to the construction-related minimization measures specified in Section 7.5.3 of the NCCP/HCP Part III Join Programmatic EIR/EIS, the following measures will be required:

- A monitoring biologist will be on the site during all ground-clearing work related to construction activity to ensure compliance with the NCCP construction-related minimization measures.
- Pre-construction surveys will be conducted for CAGN, cactus wren, and southern California rufous-crowned sparrow.
- After project completion the work area will be cleaned up and all equipment, flagging, etc. will be removed from the site.
- A post-construction assessment will be conducted by the biologist to document final impacts on coastal sage scrub and cactus scrub.
- The affected area will be restored as per the agency-approved restoration plan.
- The site will be monitored and maintained for 3 years.

b. 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?

Less-than-Significant Impact with Mitigation Incorporated. There is no riparian habitat located within the vicinity of the proposed project, and therefore no impacts on riparian areas would occur as a result of the proposed project. The proposed project site contains coastal sage scrub, which is considered sensitive by California Department of Fish and Game (CDFG). Impacts that would result from the proposed project on coastal sage scrub and cactus are authorized by the NCCP/HCP. Compliance with the NCCP/HCP would result in less-than-significant impacts on these communities within the NCCP/HCP area. Impacts on CSS outside of the NCCP/HCP would be temporary and would be revegetated per **MM BIO-4** above. No further mitigation is required.

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

No Impact. There are no federally protected wetlands or other jurisdictional waters in the vicinity of the proposed project that could be affected by the proposed project. No impact would occur.

d. 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?

No Impact. There are no wetlands or running waters within the vicinity of the proposed project. The proposed project would not affect fish movement. The proposed project is not within an established wildlife corridor, and does not involve the construction of extensive facilities or fences that could impede wildlife movement. The proposed project would not interfere with the movement of any native resident or migratory wildlife species or with established native resident or migratory wildlife corridors, and would not impede the use of native wildlife nursery sites. No impact would occur.

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

No Impact. The proposed project would not conflict with any local policies or ordinances protecting biological resources. The only trees that would be removed during construction of the proposed project include a small number of eucalyptus trees during the relocation of the EOCWD Turnout. The City of Orange does not have any local policies or ordinances protecting eucalyptus trees; therefore, relocation of the EOCWD Turnout would not result in a conflict. No tress would be removed during operation of the proposed project. No impact would occur.

f. Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?

Less-than-Significant Impact with Mitigation Incorporated. Section 5.9 of the NCCP includes the following in its definition of allowable infrastructure facilities: "water lines, reservoirs and associated facilities (e.g., pump stations, pressure control facilities, and access roads), and regional water storage and treatment facilities." The proposed project improvements are applicable to this definition of public infrastructure and therefore would be consistent with the NCCP.

Activities related to removal of the emergency bypass line would occur within the NCCP/HCP. The NCCP authorizes IRWD, as a participating landowner, the take of 60 acres of coastal sage scrub within the NCCP/HCP for infrastructure projects. IRWD would mitigate impacts to natural vegetation communities and no permanent take would occur. Implementation of **MM BIO-8** and **MM BIO-9** would minimize impacts resulting from construction activity to the maximum extent feasible in compliance with the NCCP/HCP. Impacts would be less than significant.

Mitigation Measure BIO-9: All temporarily disturbed areas (approximately 0.72 acre) within natural vegetation communities will be restored to appropriate native habitats following project completion. The restoration plan, approved by NROC, CDFG, United States Fish & Wildlife Service (USFWS) and County of Orange, will be implemented in fall prior to the first rain season after complete removal of the emergency bypass line (as described in Appendix A).

V. Cultural Resources	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a. Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	☐	☐	☐	☒
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	☐	☒	☐	☐
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐
d. Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

Discussion

Would the project:

a. Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?

No Impact. The proposed project would not directly impact known historical resources within the proposed project area. One historic-period built environment resource has been recorded in the project area, a 1940 single-family residence (30-17872) at 10604 Meads Avenue, now part of the Ridgeline Country Club (Sorrell 2007). However this structure was determined not eligible for listing on National Register, California Register or any local register. No additional historical structures are located within a 0.5-mile radius of the proposed project. No historical structures in the proposed project area are listed on any local, state, or national historical registers, nor are any determined to be eligible for listing as a significant historical resource.

The majority of the proposed project improvements would take place within existing roadways and would not affect existing structures. The pipeline distribution system in the OPA service area is old, with some sections of riveted steel pipe constructed as early as 1929. However this type of common infrastructure is not considered a significant historical structure.

The majority of the existing OPA domestic water system has been installed since the 1960s. Water tanks and other structural features of the OPA domestic water system can be clearly seen on the Orange 7.5 USGS topographic map as having been built between 1964 and 1981. Built environment resources constructed after 1960, unless extraordinarily important, are not considered sufficiently old to be potentially significant historical structures or resources. Construction of the proposed project will not impact significant historic-period built environment resources.

b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?

Less-than-Significant Impact with Mitigation Incorporated. The proposed project could potentially impact archaeological resources within the project area. Approximately 420 acres of the 646-acre OPA service area have been previously surveyed for archaeological resources, primarily in the 1970s. Two prehistoric archaeological sites were located during those surveys, CA-Ora-702 and CA-Ora-774. CA-Ora-702 (Desautels and Whitney 1977) was located in 1977during tree removal and grading for a housing development (see Appendix D for results of the Cultural Resources Records Search). A very small collection of artifacts were recovered, including a metate, scraper plane, chopper and part of a mano. However, the site record indicated that this site was buried, with cultural materials recovered at a depth of at least 36 inches below the modern ground surface. This site had probably been buried by alluvial deposition from the adjacent hillsides, as well as by historic-period agricultural plowing. CA-Ora-774 (Van Horn 1979) was also a small collection consisting of a core and three stone flakes. Both sites have since been destroyed by development.

Eleven additional prehistoric archaeological sites have been recorded within a 0.5-mile radius of the proposed project with the majority of discoveries consisting of small stone tool scatters. Just one site contains substantial prehistoric remains and is located just south and east of the proposed project along Santiago Creek, CA-Ora-556 (Leonard 1974). Nine of these 11 sites are on the edges of Santiago Creek, and are not within the OPA service area in which construction would occur. The two sites in the OPA service area encompass three and four artifacts. This suggests that the potential for discovery of prehistoric cultural materials during construction of the proposed project is low.

The majority of the proposed project improvements would occur within existing paved streets and existing facilities where the ground surface has been previously graded. For this reason, no archaeological resources survey was performed for the proposed project.

However, because depositional activity associated with Santiago Creek, Handy Creek, or general alluvial deposition within the vicinity of the proposed project may have obscured prehistoric or historical archaeological materials, significant buried cultural resources may exist within the proposed project area that do not possess surface indicators. It is possible that these archaeological materials could be unearthed during ground-disturbing activities; therefore construction of the proposed project may have the potential to disturb and destroy an unknown archaeological resource. Disturbance of significant archaeological resources would result in a significant impact. **MM CR-1** will reduce impacts associated with the proposed project to a less-than-significant level.

Mitigation Measure CR-1: During construction, in the event that cultural resources are discovered in the proposed project area during ground-disturbing activities, work will stop in that area and within 50 feet of the find until a qualified archaeologist can assess the significance of the find and, if necessary, develop appropriate treatment measures. Treatment measures typically include development of avoidance strategies, capping with fill material, or mitigation of impacts through data recovery programs such as excavation or detailed documentation.

c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Less-than-Significant Impact with Mitigation Incorporated. The proposed project area is situated on Quaternary non-marine terrace deposits, Quaternary alluvium, and bedrock of the Tertiary Topanga, Vaqueros, and Sespe Formations (Morton, P.K., 1981). Quaternary Holocene-age

alluvium has a low potential for vertebrate fossils, but older Quaternary deposits have a higher potential for vertebrate fossils, primarily of mammals of the Pleistocene epoch. The Tertiary sedimentary formations in the OPA areas can be highly fossiliferous, containing vertebrate, invertebrate, and plant fossil specimens (Stadum 2010). Surface grading or very shallow excavation in the proposed project area is unlikely to uncover significant fossil vertebrates. Deeper excavations that extend into older Quaternary deposits or excavations into Tertiary bedrock, even at a relatively shallow depth, however, may encounter significant fossil vertebrate remains. Disturbance of significant paleontological resources would result in a significant impact. **MM CR-2** will reduce impacts associated with the proposed project to a less-than-significant level.

Mitigation Measure CR-2: During construction, in the event that suspected paleontological resources or fossiliferous units are discovered during ground-disturbing activities, work will stop in that area and within 50 feet of the find until a qualified paleontologist is contacted and can assess the significance of the find. If necessary, the paleontologist will develop appropriate treatment measures, which may include provisions for recovery, treatment, and curation of any recovered paleontological resources. Treatment measures may also include monitoring the remainder of construction activities by a qualified paleontologist during construction-related ground-disturbing activities if paleontological resources are discovered.

d. Disturb any human remains, including those interred outside of formal cemeteries?

Less-than-Significant Impact with Mitigation Incorporated. As discussed in V-d, most of the OPA service area has been previously surveyed for archaeological resources. Prehistoric archaeological sites were located during those surveys, none of which contained any trace of prehistoric human remains. This suggests that the potential for discovery of human remains during construction of the proposed project is low.

However, because depositional activity associated with Santiago Creek and Handy Creek, or general alluvial deposition within the proposed project area, may have obscured prehistoric human remains, significant buried cultural resources might exist within the proposed project area that do not possess surface indicators. It is possible human remains could be unearthed during excavation activities, and therefore construction of the proposed project may have the potential to disturb human remains. Disturbance of human remains would result in a significant impact. **MM CR-3** will reduce impacts associated with the proposed project to a less-than-significant level.

Mitigation Measure CR-3: Project plans will specify that if human remains are exposed during construction, construction will halt within 50 feet of the area of discovery of human remains, the area will be protected, and consultation and treatment will occur as prescribed by law. The coroner will be contacted and will determine whether the remains are those of a Native American. If human remains of Native American origin are discovered during ground-disturbing activities, it is necessary to comply with state laws relating to the disposition of Native American burials that fall within the jurisdiction of the California Native American Heritage Commission (NAHC) (Public Resources Code Section 5097). For remains of Native American origin, the most likely descendant of the deceased Native American(s) will be contacted, and will make a recommendation to the landowner or IRWD regarding means of treating or disposing of the human remains and any associated grave goods, with appropriate dignity, as provided in the Pub. Res. Code Section 5097.9. In consultation with the most likely descendant, the project archaeologist and IRWD will determine a course of action regarding preservation or excavation of Native American human remains, and this recommendation will be implemented expeditiously. If the NAHC is unable to identify a most likely descendant or the

descendant fails to make a recommendation within 48 hours after being notified by the Commission, the project archaeologist and IRWD will determine a course of action regarding preservation or excavation of Native American human remains, which will be submitted to the NAHC for review prior to implementation.

VI. Geology and Soils	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
1. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
2. Strong seismic groundshaking?	☐	☐	☒	☐
3. Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
4. Landslides?	☐	☐	☒	☐
b. Result in substantial soil erosion or the loss of topsoil?	☐	☒	☐	☐
c. Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project and potentially result in an onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☒	☐
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☒	☐
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒

Discussion

Would the project:

a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

a1. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

Less-than-Significant Impact. Under the Alquist-Priolo Act, the California State Geologist identifies areas in the state that are at risk from surface fault rupture. These areas are known as Earthquake Fault Zones (EFZs). The proposed project site is not located within an EFZ, and the nearest EFZ is the potentially active fault in the vicinity of Prado Dam and Yorba Linda located approximately 6 miles to the northeast of the proposed project (CDMG 2003).

The proposed project site is located within a seismically active region that has been subject to major earthquakes in the past. The San Andreas Fault, Whittier-Elsinore Fault, Newport-Inglewood Fault and San Jacinto Fault are large, active faults located within 30 miles of the proposed project. Smaller fault traces are located in the vicinity of the project site. The El Modena Fault bisects the project site and the Peralta Hill Fault is located along the northeastern border of the project. These faults are not considered capable of producing major earthquakes (City of Orange 2005a). The proposed project would not include any habitable structures, and would not expose persons to hazards from the rupture of a known earthquake fault. Impacts would be less than significant.

a2. Strong seismic groundshaking?

Less-than-Significant Impact. As discussed in VI-a1, the proposed project is not located within an EFZ. However the proposed project area is known to contain multiple fault traces and all communities in Southern California are subject to seismic ground shaking. The proposed project would be constructed in accordance with all applicable building codes to minimize impacts on the proposed domestic water system infrastructure from seismic activity. Furthermore, the proposed project would not create any new habitable structures and therefore would not expose people or structures to potentially substantial adverse effects involving strong seismic ground shaking. Impacts would be less than significant.

a3. Seismic-related ground failure, including liquefaction?

Less-than-Significant Impact. As discussed in VI-a1, the proposed project site is located in a seismically active region subject to strong ground shaking. According to the City of Orange General Plan, there is a large area subject to liquefaction located to the east, but outside, of the proposed project area (City of Orange 2005a). The proposed project would be constructed in accordance with all applicable building codes to minimize impacts on the proposed domestic water system infrastructure from seismic activity. Furthermore, the proposed project would not create any new habitable structures and therefore would not expose people or structures to potentially substantial adverse effects involving seismic-related ground failure. Impacts would be less than significant.

a4. Landslides?

Less-than-Significant Impact. As discussed in VI-a1, the proposed project site is located in a seismically active region subject to strong ground shaking. Small portions of the proposed project area are subject to landslides, specifically areas along the northwestern border of the proposed project area near Morada Drive, and in the southern portion of the proposed project area near Chapman Avenue (City of Orange 2005a). However, the proposed project would be constructed in accordance with all applicable building codes to minimize impacts on the proposed domestic water system infrastructure from seismic activity. Furthermore, the proposed project would not create any new habitable structures and therefore would not expose people or structures to potentially substantial adverse effects involving landslides. Impacts would be less than significant.

b. Result in substantial soil erosion or the loss of topsoil?

Less-than-Significant Impact with Mitigation Incorporated. Construction of the proposed project would include ground surface disruption during trenching activities and demolition of the OPA reservoir that could result in soil erosion. During grading and site preparation activities, unearthed

and exposed soil could create fugitive dust during windy conditions and from construction vehicles traversing the proposed project site. In the event of heavy precipitation, these exposed soils could potentially be transported off the site as runoff. Implementation of **MM GEO-1** would result in less-than-significant impacts from stormwater pollution for the proposed project.

The erosion potential of the proposed project during operation is minimized due to the fact that the roadway surfaces disrupted during construction activities related to the transmission main would be repaved, and surfaces within vegetated areas disturbed during construction would be revegetated following construction, thereby preventing soil erosion. Impacts would be less than significant with mitigation incorporated.

Mitigation Measure GEO-1: Preparation of a SWPPP. IRWD will prepare and submit a Stormwater Pollution and Prevention Program (SWPPP) to the SARWQCB for review and approval prior to any construction-related activities. The SWPPP will outline proposed BMPs to minimize water contamination to stormwater during construction, pursuant to Section 402 National Pollutant Discharge Elimination System (NPDES) requirements. IRWD will ensure that the construction contractor complies with all stipulations of the proposed project's SWPPP, thereby avoiding violations of water quality standards and waste discharge requirements during construction.

c. Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project and potentially result in an on-site or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?

Less-than-Significant Impact. The proposed project area is moderately hilly in some areas and construction activities would involve trenching throughout the proposed project area. These trenches would be filled in with soil, compacted, and repaved or revegetated once replacement of the OPA transmission main is complete. Similarly, demolition of the OPA reservoir would involve removal of the existing structure in that area and the void would be filled in, compacted, and graded to match the surrounding terrain. As discussed in VI-a3, the proposed project area is not subject to liquefaction, and the depth and intensity of ground-disturbing activities are not anticipated to result in on-site or off-site spreading, subsidence or collapse. Impacts would be less than significant.

d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

Less-than-Significant Impact. Expansive soils are fine-grained soils (generally high plasticity clays) that can undergo a significant increase in volume with an increase in water content and a significant decrease in volume with a decrease in water content. Changes in the water content of an expansive soil can result in severe distress to structures constructed upon the soil. Construction activities would involve trenching throughout the proposed project area, which would be back-filled with stable imported soil and fill materials, and would be compacted to minimize impacts from potential soil expansion once replacement of the transmission main is complete. Similarly, demolition of the OPA reservoir would involve removal of the existing structure in that area and the void would be filled in, compacted, and graded to match the surrounding terrain. The proposed project would restore the existing ground surface to match the existing condition and would not include any new habitable structures, and therefore would not place any persons or developed property at risk due to expansive soils. Impacts would be less than significant.

e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater?

No Impact. The proposed project would not include any habitable structures, septic tanks or alternative wastewater disposal systems. No impact would occur.

VII.	Greenhouse Gas Emissions	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:					
a.	Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b.	Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

Discussion

Would the project:

a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Less-than-Significant Impact. Table 3-3 presents an estimate of proposed project construction-related greenhouse gas (GHG) emissions of CO_2, CH_4, and N_2O in terms of CO_2e (carbon dioxide equivalent). As described in the response to III-b, operations associated with the proposed project generally include pipeline and facility maintenance activities and are expected to be similar to or less than existing conditions, therefore operational GHG emissions were not analyzed. Because quantitative GHG guidelines, including thresholds, have not officially been developed by the SCAQMD, construction-related GHG emissions have been compared to both official and interim thresholds set by other agencies, and are provided for information and discussion purposes only.

Table 3-3. Estimate of Proposed Project Construction-Related Greenhouse Gas Emissions

	Annual CO_2e (metric tons)
Proposed Project Emissions	
Construction-Period Emissions	
2010	176.3
2011	587.0
CAPCOA Significance Threshold	900
BAAQMD Significance Threshold	1,100
SCAQMD Significance Threshold	3,000
Exceed Threshold?	No

Source: ICF 2010. URBEMIS 2007 outputs are provided in Appendix B.

The quantity of proposed project construction-related GHG emissions falls below all suggested GHG thresholds. As such, emissions generated by construction of the proposed project, without considering other cumulative global emissions, would be insufficient to cause global climate change.

Thus, proposed project construction-related emissions, in isolation, are considered less than significant. However, climate change is a global cumulative impact, so the construction-related GHG emissions must additionally be considered as a contribution to cumulative GHG emissions.

With regard to climate change and GHG emissions, the amounts of GHG emissions that would result from construction and operation of the proposed project would be less than that which would be generated by continued maintenance and operation of the existing aging system due to the increasing need to conduct emergency and piecemeal improvements as various components fail. Furthermore, construction emissions would total approximately 763 metric tons CO_2e, which is far below the preliminary threshold that is currently being contemplated by the SCAQMD's GHG Significance Thresholds Working Group of 3,000 metric tons CO_2e per year. Additionally, construction-related emissions are below the much stricter thresholds set by the California Air Pollution Control Officers Association (CAPCOA) and the Bay Area Air Quality Management District (BAAQMD). Therefore, impacts from GHG emissions related to construction and operation of the proposed project would be less than significant.

b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Less-than-Significant Impact. Assembly Bill 32 (AB 32), passed by the California State Legislature in 2006, aims to reduce GHG emissions in California to 1990 levels by the year 2020. AB 32 identified the acceptable level of GHG emissions in California in 2020 as 427 million metric tons of CO_2e, which is the same as the 1990 GHG emissions level, is approximately 12% less than the current level (480 million metric tons CO_2e in 2004), and is approximately 28.5% less than 2020 Business As Usual (BAU) conditions (596 million metric tons CO_2e). To achieve these GHG reductions, widespread reductions of GHG emissions must be made across California. Some reductions will need to come in the form of changes in vehicle emissions and mileage, changes in electricity sources, and increases in energy efficiency by existing facilities, as well as other measures. The remainder of the necessary GHG reductions will need to come from requiring new facility development to have lower carbon intensity than BAU conditions. Therefore, this analysis uses a threshold of significance that is in conformance with the state's goals.

Construction of the proposed project is expected to result in temporary increased emissions of GHGs, largely due to motor vehicle trips, energy consumption, and water consumption. Increased emissions of GHGs would contribute to global warming and the adverse global environmental effects thereof. Increased GHG emissions could also potentially conflict with the requirement of AB 32 to reduce statewide GHG emissions to 1990 levels by 2020. However, as discussed in VII-a, the amounts of GHG emissions that would result from construction and operation of the proposed project would be less than that which would be generated by continued maintenance and operation of the existing aging system due to the increasing need to conduct emergency and piecemeal improvements as various components fail.

On December 12, 2008, the California Air Resources Board (CARB) approved the AB 32 Scoping Plan, which contains emission reduction measures targeting sources of GHG emissions called for in AB 32. The scoping plan has a range of GHG reduction actions that include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market based mechanisms such as a cap-and-trade system, and an AB 32 cost of implementation fee regulation to fund the program.

Proposed project operational GHG emissions would result from on-site electricity consumption, which would be similar to the existing consumption of electricity used to operate the domestic water system within the OPA service area. In their AB 32 Scoping Plan, CARB has set in place aggressive energy efficiency measures requiring that 33% of all energy consumed in California come from renewable sources by 2020. Assuming conformity with CARB standards, GHG emissions in 2020 associated with operation of the proposed project are expected to be 33% less than under BAU conditions. Impacts would be less than significant.

VIII. Hazards and Hazardous Materials	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☒	☐	☐
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☒	☐	☐
c. Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐
d. Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☒	☐
e. Be located within an airport land use plan area or, where such a plan has not been adopted, be within two miles of a public airport or public use airport, and result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f. Be located within the vicinity of a private airstrip and result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☒	☐	☐
h. Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☒	☐

Discussion

Would the project:

a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Less-than-Significant Impact with Mitigation Incorporated. Operation of the proposed project would not involve transport, storage, use, or disposal of hazardous materials. Construction activities would be short term in nature and may involve the limited transport, storage, use, or disposal of

hazardous materials such as motor fuel. Some examples of typical hazardous materials handling include fueling and servicing construction equipment on the site and the transport of fuels, lubricating fluids, solvents, and bonding adhesives. These types of materials are not acutely hazardous, and all storage, handling, and disposal of these materials are regulated by local, county, and state laws. The construction contractor would strictly adhere to the regulations set forth by these agencies.

During replacement of the OPA transmission main some portions of the existing transmission main may be removed. Generally, the existing transmission main is composed of non-hazardous materials, but some of it is known to be asbestos-cement pipe (ACP) (Figure 2-4). In the event that some of the ACP pipeline is removed, it would be disposed of according to all applicable federal, state, and local laws. ACP pipeline that is abandoned in place would not present a hazard to the public due to the fact that it would be filled with a solid substance to prevent collapse and would not be subject to disturbance. Furthermore, although the OPA reservoir is not known to contain hazardous materials, the age of the facility and lack of information about its original construction may result in the discovery during demolition that some materials are considered hazardous. Implementing **MM HM-1** would ensure that asbestos-containing materials, if discovered or removed by the construction contractor, would be handled and disposed of according to all applicable regulations. Following construction, operation of the proposed project would not involve the routine transport, use, or disposal of any hazardous materials. Impacts would be less than significant with mitigation incorporated.

Mitigation Measure HM-1. Project plans will specify that the construction contractor will abate the proposed project's asbestos-related impacts by removing all potentially friable asbestos-containing materials in accordance with federal, state, and local laws and guidelines established by the National Emissions Standards for Hazardous Air Pollutants (NESHAP) prior to activities that might disturb the materials. All demolition activities will be undertaken in accordance with the California Occupational Safety and Health Administration (Cal/OSHA) standards contained in Title 8 of the California Code of Regulations (CCR), Section 1529, to protect workers from exposure to asbestos. Materials containing more than 1% asbestos are also subject to SCAQMD regulations. Demolition performed in conformance with all federal, state, and local laws and regulations will avoid significant exposure of construction workers and/or the public to asbestos-containing materials.

b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Less-than-Significant Impact with Mitigation Incorporated. As discussed in VIII-a, construction activities would involve a limited use of hazardous materials during construction, and operation would not involve any use of hazardous materials. The City of Orange Fire Department provides a wide array of services to the city, including hazardous materials first response (City of Orange 2010a). Furthermore, the Orange County Fire Authority (OCFA) has coordinated preparation of the Orange County Hazardous Waste Management Plan. The plan establishes countywide policy for waste treatment, transportation and disposal (City of Orange 2005b). Compliance with the plan is mandatory as a condition of standard permitting, and would minimize the potential for the accidental release or upset of hazardous materials, helping to ensure public safety.

Construction equipment that would be used in construction of the proposed project has the potential to release oils, greases, solvents, and other finishing materials through accidental spills.

Spill or upset of these materials would have the potential to affect surrounding land uses. However, the consequences of construction-related spills are generally reduced in comparison to other accidental spills and releases because the potential amount of hazardous material released during a construction-related spill is small because the volume in any single piece of construction equipment is generally less than 50 gallons. Construction-related spills of hazardous materials are not uncommon, but the enforcement of construction and demolition standards, including BMPs by appropriate local and state agencies, would minimize the potential for an accidental release of petroleum products and/or hazardous materials or explosions during construction. Federal, state, and local regulations would be followed by the construction contractor to reduce the effects of potential hazardous materials spills. **MM GEO-1,** which specifies that IRWD will prepare and submit a SWPPP to the SARWQCB for review and approval prior to any construction-related activities, would also reduce any potential impacts. The proposed project would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. Impacts would be less than significant with mitigation incorporated.

c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Less-than-Significant Impact. The proposed project is within 0.25 mile of four existing schools: Linda Vista Elementary School, located approximately 100 feet from proposed construction on Cannon Street; Salem Lutheran Preschool, located approximately 100 feet from proposed construction on Frank Lane; Silverado Elementary School located approximately 100 feet from proposed construction at the intersection of Meads Avenue and Santiago Canyon Road; and Santiago Canyon College, located approximately 100 feet from proposed construction on East Chapman Avenue.

As discussed in VIII-b, construction of the proposed project would involve the use small amounts of hazardous materials subject to federal, state, and local regulations. Once construction is completed these materials would no longer be present at the site of the transmission main alignment. Furthermore, operation would not involve handling or emitting any hazardous materials. No element of the proposed project would involve acutely hazardous materials, substances, or wastes. Impacts would be less than significant.

d. Be located on a site that is included on a list of hazardous materials sites that complied pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Less-than-Significant Impact. The general proposed project vicinity contains four leaking underground fuel tank (LUFT) cleanup sites (DTSC 2010). However, three of the four LUFT sites have completed cleanup activities and the cases have been closed. The one open case is at a Unocal gas station, which would not affect the proposed project due to its location away from project-related construction. Table 3-4 identifies the four different LUFT sites, locations and relative distances from the proposed project area, and current clean-up status.

Table 3-4. Nearby Hazardous Materials Sites

LUFT Site Name	Location	Location Relative to Project Area	Clean-up Status
UNOCAL #5106	5344 E. Chapman Ave	.75 mile southwest from southern portion of the Central Service Area	OPEN – Has been in remediation as of 4/25/2008
Hamilton Materials Inc	345 Meads Ave	Within in the northeaster portion of the Central Service Area	Completed – Case Closed as of 4/17/2003
Orange County Fire Station #23	5020 Santiago Canyon	Located less than 0.5 mile from the southeast portion of the Central Service Area	Completed – Case Closed as of 8/25/1999
Diocese of Orange	7845 E. Santiago Canyon Road	Located less than 0.5 mile from the southeast portion of the Central Service Area	Completed – Case Closed as of 11/1/1999

Source: DTSC. 2010

Construction would not occur on any of these sites, or within the immediate vicinity that activities would impact or be affected by the release of hazardous materials from these sites. Impacts would be less than significant.

e. For a project within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?

No Impact. The nearest airport is John Wayne Airport, approximately 10 miles to the southwest of the project site. In addition Fullerton Municipal Airport is located approximately 11 miles to the northwest. The proposed project is not located within an airport land use plan area or within 2 miles of a public airport or public use airport (Google Earth 2010). The proposed project would not result in a safety hazard for people residing or working in the project area. No impact would occur.

f. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?

No Impact. The nearest airport is John Wayne Airport, approximately 10 miles southwest of the project site. In addition Fullerton Municipal Airport is located approximately 11 miles to the northwest. The proposed project is not located within the vicinity of a private airstrip (Google Earth 2010). The proposed project would not result in a safety hazard for people residing or working in the project area. No impact would occur.

g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Less-than-Significant Impact with Mitigation Incorporated. According to the Safety Element of the City of Orange General Plan, a segment of the City's evacuation route follows Chapman Avenue in the project area (City of Orange 2005c). Construction within roadways would generally require closure of no more than one lane of traffic and vehicular access around construction activities would be maintained at all times. In addition the construction contractor would implement **MM TR-1** (see XVI-a) and develop a traffic control plan to ensure through-street access when working in roadways to ensure that evacuation routes are not blocked or otherwise affected. Impacts would be less than significant with mitigation incorporated.

h. Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

Less-than-Significant Impact. The proposed project area is located within 0.5 mile of a "Wildland Fire Hazard Area" as identified in the Safety Element of the City of Orange General Plan (City of Orange 2005b). Construction and operation of the proposed project would occur outside of this area. The majority of project elements would take place in dedicated street rights-of-way and easements and at existing IRWD facilities. The proposed project would not include the addition of any housing structures or other habitable structures, and would not increase the potential for exposure of people or property to wildland fire hazards. Impacts would be less than significant.

IX. Hydrology and Water Quality		Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:					
a.	Violate any water quality standards or waste discharge requirements?	☐	☒	☐	☐
b.	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c.	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite?	☐	☐	☒	☐
d.	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite?	☐	☐	☒	☐
e.	Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐
f.	Otherwise substantially degrade water quality?	☐	☐	☒	☐
g.	Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h.	Place within a 100-year flood hazard area structures that would impede or redirect floodflows?	☐	☐	☐	☒
i.	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?	☐	☐	☐	☒
j.	Contribute to inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒
k.	Potentially impact stormwater runoff from construction activities?	☐	☒	☐	☐

IX. Hydrology and Water Quality		Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
l.	Potentially impact stormwater runoff from post-construction activities?	☐	☐	☒	☐
m.	Result in a potential for discharge of stormwater pollutants from areas of material storage, vehicle or equipment fueling, vehicle or equipment maintenance (including washing), waste handling, hazardous materials handling or storage, delivery areas, loading docks or other outdoor work areas?	☐	☒	☐	☐
n.	Result in the potential for discharge of stormwater to affect the beneficial uses of the receiving waters?	☐	☒	☐	☐
o.	Create the potential for significant changes in the flow velocity or volume of stormwater runoff to cause environmental harm?	☐	☐	☒	☐
p.	Create significant increases in erosion of the project site or surrounding areas?	☐	☒	☐	☐

Discussion

Would the project:

a. Violate any water quality standards or waste discharge requirements?

Less-than-Significant Impact with Mitigation Incorporated. IRWD would prepare and submit a SWPPP to the SARWQCB for review and approval prior to any construction-related activities. The SWPPP would outline proposed BMPs to minimize water contamination to stormwater during construction, pursuant to Section 402 NPDES requirements. Implementation of **MM GEO-1** would reduce these impacts to less than significant.

Operation of the proposed project would not result in discharges of water, except for emergency or periodic maintenance activities. The proposed project would not violate water quality standards or waste discharge requirements. Impacts would be less than significant.

b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?

No Impact. The proposed project involves upgrades and improvements to the existing domestic water pipeline system to increase pressure and flows to the OPA service area. The water supply for the OPA service area is provided by an existing groundwater well, located at the former OPAMWC headquarters along Gravier Street at Bond Avenue. No changes are proposed to the well, pumping rate, or capacity as part of the proposed project.

The proposed project would include a connection to IRWD's Zone 5 pumping station as well as to the future East Orange and Santiago Hills II planning areas. Therefore, the transmission main is sized to accommodate OPA flows plus future flows to serve the East Orange and Santiago Hills II planning areas, for which the combined maximum daily demand is estimated to be 3,870 gpm. This ultimate demand would result in increased groundwater production and would be accommodated by the future replacement of the OPA well and addition of another well to serve the East Orange and Santiago Hills II planning areas. Future well replacement and additions would be implemented in accordance with the existing August 2006 agreement between IRWD and the City of Orange. The water demand to service the East Orange and Santiago Hills II planning areas has already been separately analyzed in an EIR prepared and adopted by the City of Orange in November 2005. The proposed project would not involve increased demand on existing groundwater or imported water supplies, and would not deplete existing water supplies. No impact would occur.

c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on site or off site?

Less-than-Significant Impact. No streams or rivers would be directly affected by construction or operation of the proposed project. The proposed project would involve trenching and demolition activities primarily in dedicated street rights-of-way and at existing IRWD facilities. These activities might temporarily alter the existing drainage pattern for the duration of construction. At completion of construction, areas disturbed by these activities would be graded to match the surrounding terrain and restored to pre-construction conditions. As discussed in IX-a, a SWPPP containing BMPs to be utilized by the construction contractor would be prepared to reduce the potential for stormwater quality impacts from erosion during construction. Impacts would be less than significant.

d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on site or off site?

Less-than-Significant Impact. As discussed in the response to IX-c, construction of the proposed project might temporarily alter the existing drainage pattern of the area. At completion of construction, areas disturbed by these activities would be graded to match the surrounding terrain and restored to pre-construction conditions. As discussed in IX-a, a SWPPP containing BMPs to be utilized by the construction contractor would be prepared to reduce the potential for stormwater quality impacts from erosion during construction. Impacts would be less than significant.

e. Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

Less-than-Significant Impact. The proposed project would not alter the amount of stormwater runoff from existing conditions. As discussed in the response to IX-c, the proposed project may temporarily alter the existing drainage pattern of the site, however at the completion of construction areas disturbed by these activities would be graded to match the surrounding terrain and restored to pre-construction conditions. As discussed in the response to IX-a, a SWPPP containing BMPs to be utilized by the construction contractor would be prepared to reduce the potential for stormwater quality impacts from erosion during construction. Impacts would be less than significant.

f. Otherwise substantially degrade water quality?

Less-than-Significant Impact. As described in response to IX-a through IX-e, the proposed project would not result in any long-term or operational impacts on water quality. Construction impacts would be reduced through the implementation of BMPs identified in the SWPPP. Potential construction impacts are addressed above and there are no other means by which construction or operation of the proposed project would substantially degrade water quality. Impacts would be less than significant.

g. Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

No Impact. The proposed project would not involve the construction of housing or habitable structures. No impact would occur.

h. Place within a 100-year flood hazard area structures that would impede or redirect flood flows?

No Impact. According to the City of Orange General Plan, parts of the proposed project area are susceptible to 100-year flood conditions (City of Orange 2005a). Although the proposed project would be constructed within this flood hazard area, the majority of the proposed project would involve replacement of the OPA transmission main, which would be entirely beneath ground surface. Other elements of the proposed project, including the PRVs and pump stations, would not be large aboveground structures that could impede or redirect flood flows. No impact would occur.

i. 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?

No Impact. According to the City of Orange General Plan Safety Element the proposed project area would be located downstream of number of major reservoirs and dams, including Villa Park Dam and Santiago Dam nearest to the proposed project site. These reservoirs and their dams prevent periodic flooding that would be expected to occur in a natural setting. Should either of these facilities fail, properties along Santiago Creek and a large section of Old Town Orange could be flooded. Flood flows would move at rates which would allow persons to be evacuated, but significant property damage could result. However these areas would not be located within the proposed project service areas and these facilities are maintained and safety-inspected to endure that risks are minimized (City of Orange 2005b). Although the proposed project would be constructed within this flood hazard area, the majority of the proposed project would involve replacement of the OPA transmission main, which would be entirely beneath ground surface. Other elements of the proposed project, including the PRVs and pump stations, would not be large aboveground structures that could impede or redirect flood flows. The proposed project would not add any housing or permanent habitable structures to the proposed project area. Therefore, the proposed project would not 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. No impact would occur.

j. Contribute to inundation by seiche, tsunami, or mudflow?

No Impact. The proposed project site is located over 15miles away from the Pacific Ocean, and is generally considered too far away to be subject to a tsunami. A number of major reservoirs located within or near the city, including Villa Park Dam and Santiago Dam, could be subject to seiches. According to the City of Orange General Plan Safety Element, a portion of the proposed project site would be located in an area subject to mass wasting (City of Orange 2005b). Mass wasting occurs in

areas where steep slopes, unstable geologic features, heavy rainfall and/or seismic activity combine to upset the force of gravity and cause earth to move down a hillside, potentially contributing to a mudflow event. The proposed project would not place any habitable facilities within the areas subject to these potential hazards.

The majority of the proposed project activities would involve the replacement of the OPA transmission main, which would be entirely beneath ground surface and would not increase hazards related to a seiche or mudflow. Other elements of the proposed project, including the PRVs and pump stations, would not have the potential to contribute to inundation of the proposed project area by a seiche or mudflow. No impact would occur.

k. Potentially impact stormwater runoff from construction activities?

Less-than-Significant Impact with Mitigation Incorporated. As discussed in the response to IX-a, IRWD would prepare and submit a SWPPP to the SARWQCB for review and approval prior to any construction-related activities. The SWPPP would outline proposed BMPs to minimize contamination to stormwater during construction, pursuant to Section 402 NPDES requirements. Implementation of **MM GEO-1** would reduce potential stormwater impacts to a less-than-significant level.

l. Potentially impact stormwater runoff from post-construction activities?

Less-than-Significant Impact. The proposed project would involve trenching and demolition activities primarily in dedicated street rights-of-way and at existing IRWD facilities. These activities might temporarily alter the existing drainage pattern for the duration of construction; however, the areas disturbed by these activities would be graded to match the surrounding terrain and would be restored to pre-construction conditions. Operation of the proposed project would not result in impacts on stormwater runoff. Impacts would be less than significant.

m. Result in a potential for discharge of stormwater pollutants from areas of material storage, vehicle or equipment fueling, vehicle or equipment maintenance (including washing), waste handling, hazardous materials handling or storage, delivery areas, loading docks or other outdoor work areas?

Less-than-Significant Impact with Mitigation Incorporated. As discussed in the response to VIII-a, construction activities would involve a limited use of hazardous materials during construction, and operation would not involve any use of hazardous materials. Also, as discussed in the response to VIII-b, construction equipment that would be used in construction of the proposed project has the potential to release oils, greases, solvents, and other finishing materials through accidental release or upset and could have the potential to affect stormwater runoff. Construction-related spills of hazardous materials are not uncommon; however, the enforcement of construction and demolition standards, including BMPs by appropriate local and state agencies, would minimize the potential for an accidental release of petroleum products and/or hazardous materials. Federal, state, and local regulations would be followed by the construction contractor to reduce the effects of potential hazardous materials spills. Furthermore, the implementation of **MM GEO-1**, which specifies that IRWD will prepare and submit a SWPPP to the SARWQCB for review and approval prior to any construction-related activities, would also reduce any potential stormwater impacts. Impacts would be less than significant with mitigation incorporated.

n. Result in the potential for discharge of stormwater to affect the beneficial uses of the receiving waters?

Less-than-Significant Impact with Mitigation Incorporated. As discussed in the response to IX-a, IRWD would prepare and submit a SWPPP to the SARWQCB for review and approval prior to any construction-related activities. The SWPPP would outline proposed BMPs to minimize contamination to stormwater during construction, pursuant to Section 402 NPDES requirements. Areas disturbed during construction activities would be graded to match the surrounding terrain and restored to pre-construction conditions, and operation of the proposed project would not result in stormwater impacts. With implementation of **MM GEO-1**, construction impacts would be less than significant.

o. Create the potential for significant changes in the flow velocity or volume of stormwater runoff to cause environmental harm?

Less-than-Significant Impact. Construction of the proposed project would involve trenching, demolition, and stockpiling of excavated materials primarily in dedicated street rights-of-way and at existing IRWD facilities. These activities could alter the flow velocity or volume of stormwater runoff for the duration of construction. Following construction, roadway surfaces disrupted during construction activities related to the transmission main would be repaved, and surfaces within vegetated areas disturbed during construction would be revegetated. All other areas disturbed by construction activities would be graded to match the surrounding terrain and restored to pre-construction conditions. Except for potential temporary impacts for the duration of construction, the proposed project would not significantly change the flow velocity or volume of stormwater runoff to cause environmental harm. Impacts would be less than significant.

p. Create significant increases in erosion of the project site or surrounding areas?

Less-than-Significant Impact with Mitigation Incorporated. As discussed in the response to IX-c, the proposed project would involve trenching, demolition, and stockpiling of excavated materials primarily in dedicated street rights-of-way and at existing IRWD facilities. These activities could alter the existing drainage pattern and expose unearthed soil to erosion for the duration of construction. Following construction, roadway surfaces disrupted during construction activities related to the transmission main would be repaved, and surfaces within vegetated areas disturbed during construction would be revegetated. All other areas disturbed by construction activities would be graded to match the surrounding terrain and restored to pre-construction conditions. Implementation of **MM GEO-1**, which specifies that IRWD will prepare and submit a SWPPP to the SARWQCB for review and approval prior to any construction-related activities, would reduce impacts from erosion during construction. Impacts would be less than significant with mitigation incorporated.

X. Land Use and Planning	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a. Physically divide an established community?	☐	☐	☐	☒
b. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☒	☐
c. Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☒	☐	☐

Discussion

Would the project:

a. Physically divide an established community?

No Impact. The proposed project involves improvements that would occur primarily within existing street rights-of-ways buried beneath the ground surface or within the existing footprint of IRWD facilities. The proposed project would not involve the addition of large aboveground structures, and no element of the proposed project would have to ability to physically divide an established community. No impact would occur.

b. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

Less-than-Significant Impact. The proposed project is in full compliance with the Orange Park Acres Specific Plan, City of Orange General Plan, and Orange County General Plan. The following Orange Park Acres Specific Plan goals and objectives are applicable to the proposed project:

- Ensure maintenance of views of positive features of and from the site.
- Preserve and enhance the natural beauty of the area.
- Enhance the natural setting through planning and landscape design.
- Include adequate roads, clear areas, and water to protect against fire.

The following City of Orange General Plan goal is applicable to the proposed project:

- Land Use Element Goal 11.0: the City's infrastructure system must be adequate to meet the needs of existing and future residents.

The following County of Orange General Plan goals and objectives are applicable to the proposed project:

- Public Services & Facilities Element General Public Services and Facilities Objective 1.1: to plan public services and facilities consistent with the Orange County General Plan.
- Public Services & Facilities Element Water System Goal 1: encourage the planning and development of a water conveyance and distribution system to meet the County's future demand.

Because the proposed project would be a replacement of existing water transmission facilities, it would not conflict with any of the above goals, policies, or objectives or any other applicable land use plan, policy, or regulation of an agency with jurisdiction over the proposed project adopted for the purpose of avoiding or mitigating an environmental effect. The proposed project is consistent with the above goals, policies, and objectives in that the proposed facilities would provide upgrades to existing water infrastructure to provide adequate service to residents and would maintain existing views and preserve the natural beauty of the area. Furthermore, utility improvements proposed on non-City right-of-way property are permitted uses and are therefore consistent with the City of Orange General Plan land use designations and zoning for those properties. Impacts would be less than significant.

c. Conflict with any applicable habitat conservation plan or natural community conservation plan?

Less-than-Significant Impact with Mitigation Incorporated. The proposed project is located within the Orange County NCCP/HCP Central/Coastal Subregion, Central Subarea, in areas identified as both NCCP Reserve and Non-Reserve areas. Although Non-Reserve areas are not considered to be habitat conservation areas, they are still managed and regulated by certain portions of the NCCP. Section 5.9 of the NCCP includes the following in its definition of allowable infrastructure facilities: "water lines, reservoirs and associated facilities (e.g., pump stations, pressure control facilities, and access roads), and regional water storage and treatment facilities." The proposed project improvements including NCCP Reserve and Non-Reserve areas are applicable to this definition of public infrastructure and therefore would be consistent with the NCCP.

Activities related to removal of the emergency bypass line would occur within the NCCP/HCP. The NCCP authorizes IRWD, as a participating landowner, the take of 60 acres of coastal sage scrub within the NCCP/HCP for infrastructure projects. IRWD would mitigate impacts within the NCCP/HCP and no permanent take is anticipated. Implementation of **MM BIO-8** and **MM BIO-9** would minimize the take resulting from construction activity to the maximum extent feasible, and will implement the project in compliance with the NCCP/HCP. Impacts would be less than significant with mitigation.

XI. Mineral Resources	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☒

Discussion

Would the project:

a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

No Impact. According to the Open Space and Conservation Element of the City of Orange General Plan, the western end of the proposed project area, near the existing well site on E. Bond Ave, overlays a regionally significant aggregated resource area (City of Orange 2005d). This portion of the proposed project area is highly developed, and the only element of the proposed project in this area would be the replacement OPA transmission main which would be placed beneath existing paved surfaces. The proposed project would not contribute to the loss of availability of a known mineral resource. No impact would occur.

b. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?

No Impact. As discussed in XI-a, the western end of the proposed project area overlays a regionally significant aggregated resource area according to the Open Space and Conservation Element of the City of Orange General Plan. No other locally important mineral resources or resource recovery sites are known within the project area. Furthermore, the proposed project would involve replacement of the existing OPA transmission main which would be placed primarily beneath existing paved surfaces, including roadway rights-of-ways and easements. Other elements of the proposed project would occur within existing IRWD facilities, and would also involve replacement of existing facilities that would not result in the loss of availability of a locally important mineral resource recovery site. No impact would occur.

XII. Noise		Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:					
a.	Expose persons to or generate noise levels in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies?	☐	☐	☒	☐
b.	Expose persons to or generate excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c.	Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒
d.	Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
e.	Be located within an airport land use plan area, or, where such a plan has not been adopted, within two miles of a public airport or public use airport and expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f.	Be located in the vicinity of a private airstrip and expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

Discussion

Would the project:

a. 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?

Less-than-Significant Impact. The proposed domestic water supply improvements would occur in portions of the City of Orange, as well as in the Orange Park Acres community of Orange County, and is therefore subject to both City and County noise regulations.

The City of Orange Noise Ordinance identifies construction noise standards that would apply to portions of the proposed project located within the City of Orange. For residential land uses, which surround the proposed project area, the maximum acceptable exterior community noise equivalent level (CNEL) is 55 decibels in the A-weighted scale (dBA). This ordinance exempts construction activities from quantitative limits identified for all other activities in the City's noise ordinance, provided that construction occurs between 7 a.m. and 8 p.m. Monday through Saturday. No construction activities are permitted outside of these hours or on Sundays and federal holidays unless a temporary variance is granted by the Health Officer and the Noise Variance Board (City of Orange 2009a).

The Orange County Noise Ordinance identifies construction noise standards that would apply to portions of the proposed project located within unincorporated Orange County. For residential land uses, including those surrounding the project site, the maximum acceptable exterior CNEL is 55 dBA. This ordinance exempts construction activities from quantitative limits identified for all other

activities in the County's noise ordinance, provided that construction occurs between 7 a.m. and 8 p.m. Monday through Saturday. No construction activities are permitted outside of these hours or on Sundays and federal holidays. (Orange County Municipal Code 1975).

Short-term construction activities would cause elevated noise levels within the project area. On-site noise generated during construction would occur primarily from the use of heavy-duty diesel-powered construction equipment and other small hand-held electric or combustion engine–driven construction equipment. Construction would occur within the hours specified in the City's and County's noise ordinances.

No noise would be generated by the proposed project after construction-related activities are completed, with the exception of periodic maintenance activities, which are the same as existing conditions and would consist of maintenance vehicles travelling to and from the proposed project site.

The magnitude of construction noise impacts would depend on the type of construction activity, the noise level generated by various pieces of construction equipment, the duration of the activity, the distance between the activity and any sensitive noise receptors, and whether local barriers and topography provide shielding effects. Construction activities would occur over a total duration of approximately 23 months. However, construction at any one location would occur for a substantially shorter period, generally several days in the case of the transmission main and distribution pipelines and several months for demolition of the reservoir. Due to the length of construction, the distance of residences to the site (some residences would be less than 100 feet from the noise-generating construction equipment), and the equipment that would be required for construction (trucks, compactors, excavator, roller, paver, tractor/loader/backhoe, jackhammer, generator, sometimes several operating simultaneously), construction of the proposed project would be expected to generate noise that would be noticeable above ambient noise levels in the surrounding environment.

Although the noise from construction is exempt from quantitative limits in both the City of Orange and the County of Orange, the noise levels would nonetheless be relatively loud and could cause annoyance to nearby noise-sensitive uses. The following BMPs will be incorporated into the project contract specifications to minimize construction noise effects.

1. All mobile or fixed noise-producing equipment used on the project that is regulated for noise output by a local, state, or federal agency shall comply with such regulation while in the course of project activity.
2. Electrically powered equipment instead of pneumatic or internal combustion powered equipment shall be used, where feasible.
3. Material stockpiles and mobile equipment staging, parking, and maintenance areas shall be located as far as practicable from noise-sensitive receptors.
4. Construction site and haul-road speed limits shall be established and enforced during the construction period.
5. The hours of construction, including noisy maintenance activities and all spoils and material transport, shall not occur between 8 p.m. and 7 a.m., or at any time on Sundays or federal holidays. Noise-producing project activity shall comply with local noise control regulations affecting construction activity or obtain exemptions therefrom.

6. The use of noise-producing signals, including horns, whistles, alarms, and bells shall be for safety warning purposes only.
7. No project-related public address or music system shall be audible at any adjacent receptor.
8. The onsite construction supervisor shall have the responsibility and authority to receive and resolve noise complaints. A clear appeal process to the Owner shall be established prior to construction commencement that will allow for resolution of noise problems that cannot be immediately solved by the site supervisor.
9. Contract incentives may be offered to the construction contractor to minimize or eliminate noise complaints resulting from project activities where project construction would result in significant noise impacts.
10. Construction signs shall be posted at sites where heavy construction work is proposed, such as the reservoir demolition site, identifying a contact name and phone number to register noise complaints.
11. For sites with heavy work involved, such as the reservoir demolition site, neighboring property owners shall be notified in writing several weeks in advance of construction activities, and shall include the construction schedule, duration, name, and contact information of the applicant.
12. Schools within 500 feet if proposed project construction activities shall be notified in writing of the construction schedule, duration, name, and contact information of the applicant. Schools shall also be notified in writing and consulted with regarding the potential to be affected by project noise/traffic and to the extent possible, the applicant shall consider school needs in construction scheduling decisions.

Construction activities would adhere to the noise regulations of the City of Orange and the County of Orange. Project construction noise impacts would be less than significant.

b. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Less-than-Significant Impact. Proposed project construction would generate varying degrees of ground-borne vibration, depending on the construction equipment being used. Operation of construction equipment generates vibrations that spread through the ground and diminish in amplitude with distance from the source. The effect on buildings located in the construction site's vicinity often varies depending on soil type, ground strata, and construction characteristics of the receiver building(s). The results from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibration at moderate levels, to slight damage at the highest levels. Ground-borne vibrations from construction activities rarely reach levels that damage structures.

The types of potential impacts from construction vibration include human annoyance and building damage. Human annoyance occurs when construction vibration rises significantly above the threshold of human perception for extended periods of time. Building damage can be cosmetic or structural. Ordinary buildings that are not particularly fragile would usually not experience any cosmetic damage (e.g., plaster cracks) at distances beyond 30 feet. This distance can vary substantially depending on the soil composition and underground geological layer between vibration source and receiver. In addition, not all buildings respond in the same way to vibration generated by construction equipment.

While the City of Orange and the County of Orange have not adopted their own quantitative thresholds for vibration, the Federal Transit Administration (FTA) has compiled typical vibration levels generated by construction equipment, which are commonly used as a reference for construction vibration level analysis. The vibration produced by construction equipment is outlined in Table 3-5.

Ground-borne vibration decreases rapidly with distance. Based on the FTA data (Table 3-6), vibration velocities from typical heavy construction equipment operation that would be used during project construction range from 0.003 to 0.089 inch per second peak particle velocity (PPV) at 25 feet from the source of activity. At 75 feet from the source activity, PPV ranges from 0.001 to 0.017 inch per second.

Because neither the state nor the local municipalities maintain regulatory standards for vibration sources, potential structural damage and human annoyance associated with vibration from construction activities were evaluated based on California Department of Transportation (Caltrans) vibration limits (Table 3-7). A vibration level of 0.10 inches per second PPV was used to evaluate impacts on nearby receptors since this level represents the boundary between barely perceptible and distinctly perceptible vibration as recognized by Caltrans and others.

Table 3-5. Typical Vibration Levels for Construction Equipment

Equipment	Approximate peak particle velocity at 25 feet (inches/second)	Approximate peak particle velocity at 75 feet (inches/second)
Large bulldozer	0.089	0.017
Loaded trucks	0.076	0.015
Small bulldozer	0.003	0.001
Jackhammer	0.035	0.007

Notes:
Peak particle velocity measured at 25 feet unless noted otherwise.
Root mean square amplitude ground velocity in decibels (VdB) referenced to 1 micro-inch/second.

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Guidelines, May 2006.

Table 3-6. Reaction of People and Damage to Buildings at Various Continuous Vibration Levels

Vibration Level - Peak Particle Velocity (PPV) (in/sec)	Human Reaction	Effect on Buildings
0.006–0.019	Threshold of perception; possibility of intrusion	Vibrations unlikely to cause damage of any type
0.08	Vibrations readily perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
0.10	Level at which continuous vibrations begin to annoy people	Virtually no risk of "architectural" damage to normal buildings
0.20	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relative short periods of vibration)	Threshold at which there is a risk of "architectural" damage to normal dwelling-houses with plastered walls and ceilings; special types of finish such as lining of walls, flexible ceiling treatment, etc., would minimize "architectural" damage
0.4–0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause "architectural" damage and possibly minor structural damage

Source: California Department of Transportation, Transportation- and Construction-Induced Vibration Guidance Manual, 2004.

With regard to the proposed project, ground-borne vibration would be generated primarily during Phase I and Phase III of project construction. The closest noise-sensitive land uses (residences, schools, etc.) are located approximately 50 feet or more from potential heavy construction activity. Because each construction vibration value is well below the 0.2 inch-per-second PPV significance threshold, vibration impacts associated with construction would be less than significant and no mitigation measures are required. Impacts from ground-borne vibration or ground-borne noise would be less than significant.

c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

No Impact. As discussed in XII-a, construction of the proposed project would generate temporary increases in ambient noise levels in the vicinity of the construction activity. However, these impacts would be temporary, lasting only for the duration of construction activities.

Long-term operation of the proposed project would not include any noise-generating activities, with the exception of periodic maintenance activities similar to existing conditions. No impact would occur.

d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Less-than-Significant Impact. As described in XII-a, construction-related activities and equipment used during construction of the proposed project would result in a temporary or periodic increase in ambient noise levels above existing levels. Long-term operation of the proposed project would

not include any noise-generating activities, with the exception of periodic maintenance activities similar to existing conditions. Impacts would be less than significant.

e. For a project located within an airport land use land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

No Impact. The nearest airports are John Wayne Airport, located approximately10 miles southwest of the proposed project site, and Fullerton Municipal Airport, located approximately 11 miles northwest of the proposed project site. The proposed project site is not within the vicinity of an airport or within an airport land use plan. In addition, because the proposed project would not include any habitable structures, the proposed project would not place any new sensitive receptors within the area of influence of any nearby airports.[2] No impact would occur.

f. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

No Impact. The proposed project is not within the vicinity of a private airstrip.[3] No impact would occur.

[2] Google Earth search conducted by ICF employee Mario Anaya on March 5, 2010.

[3] Google Earth search conducted by ICF employee Mario Anaya on March 5, 2010.

XIII. Population and Housing	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a. Induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?	☐	☐	☐	☒
b. Displace a substantial number of existing housing units, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c. Displace a substantial number of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Discussion

Would the project:

a. Induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure?

No Impact. The proposed project would not include new homes or businesses. The proposed project is a replacement of existing domestic water system facilities intended to increase pressures and flows and the reliability of domestic water service provided to residents within the OPA service area. The developer of the Ridgeline Equestrian Estates project (Draft EIR released on October 9, 2009) would have the option to choose to have domestic water service provided by either IRWD or the City of Orange, per a 1979 Settlement Agreement between OPAMWD (now a part of IRWD) and the City of Orange. In the event that the developer of the Ridgeline Equestrian Estates project chooses IRWD, facilities replaced as part of the proposed project would ultimately be used to provide domestic water service to the new development. The EIR prepared for the Ridgeline Equestrian Estates project separately analyzed the water demand required for this development. In addition, the proposed project would also include a connection to the future East Orange and Santiago Hills II planning areas; however, the water demand to service these developments has already been separately analyzed in an EIR prepared and adopted by the City of Orange in November 2005. The proposed project would not induce population growth and would not increase demand on existing groundwater or imported water supplies. No impact would occur.

b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

No Impact. Construction activities would take place primarily within existing dedicated street rights-of-way and easements or within existing IRWD facilities. Some new easements would be required through private property to allow for the placement of domestic water transmission mains and distribution lines beneath these properties. The proposed project would not involve the take of any private property and it would not displace existing housing. No impact would occur.

c. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

No Impact. As stated in XIII-b, the proposed project would not displace existing housing. The proposed project would not displace any people and would not require the construction of replacement housing elsewhere. No impact would occur.

XIV. Public Services	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or a need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:				
1. Fire protection?	☐	☒	☐	☐
2. Police protection?	☐	☒	☐	☐
3. Schools?	☐	☐	☐	☒
4. Parks?	☐	☐	☒	☐
5. Other public facilities?	☐	☐	☐	☒

Discussion

Would the project result in substantial adverse physical impacts associated with:

a1. Fire protection?

Less-than-Significant Impact with Mitigation Incorporated. Fire protection in the vicinity of the proposed project is provided by the City of Orange Fire Department and the OCFA. The City of Orange Fire Department operates out of eight fire stations with stations #4 and 7 within two miles of the proposed project area (City of Orange 2010b). The Orange County Fire Authority operates one fire station, station #23, located in the immediate vicinity of proposed project (OCFA 2010). Construction of the proposed project would take place in dedicated street rights-of-way and easements and could involve lane closures. However, no more than one lane would be closed at any one time, and through-street access and access to all private properties would be maintained at all times during construction (City of Orange 2003). All work would comply with the Caltrans MUTCD and the WATCH. Furthermore, prior to construction, the project contractor would implement **MM TR-1** (see XVI-a) and develop a traffic control plan to ensure adequate through-street access is maintained when construction occurs within roadways.

The proposed project would not increase the demand for existing fire protection services because it would not introduce additional housing units, would not introduce additional people to the proposed project area, and would not induce population growth. The proposed project would implement improvements to the existing domestic water supply system to meet current fire flow requirements to address water pressure and flow problems with the existing system. Service ratios and response times provided by the existing fire protection services in the vicinity of the proposed project would not be affected by proposed project activities and resulting in the need for additional fire protection facilities. Impacts would be less than significant with **MM TR-1** incorporated.

a2. Police protection?

Less-than-Significant Impact with Mitigation Incorporated. Police protection in the vicinity of the proposed project is provided by the City of Orange Police Department and the Orange County Sheriff's Department. The City of Orange Police Department is located approximately 5.7 miles to the west of the proposed project area at 1107 North Batavia Street (City of Orange 2010c). The Orange County Sheriff patrols the Orange Park Acres unincorporated area and operates out of the north county headquarters located in Santa Ana (OCSD 2010). Construction of the proposed project would take place in dedicated street rights-of-way and easements and could involve lane closures. However, no more than one lane would be closed at any one time, and through-street access and access to all private properties would be maintained at all times during construction (City of Orange 2003). All work would comply with the Caltrans MUTCD and the WATCH. Prior to construction, the project contractor would implement **MM TR-1** (see XVI-a) and develop a traffic control plan to ensure adequate through-street access is maintained when working in roadways.

The proposed project would not increase the demand for existing police protection services because it would not introduce additional housing units, would not introduce additional people to the proposed project area, and would not induce population growth. Service ratios and response times provided by the existing police protection services in the vicinity of the proposed project would not be affected by project activities and resulting in the need for additional police protection facilities. Impacts would be less than significant with **MM TR-1** incorporated.

a3. Schools?

No Impact. As discussed in XIII-a, because the proposed project would not include the addition of housing or persons to the project area and it would not induce population growth, it would not affect service ratios or performance objectives of schools in the vicinity of the proposed project area, resulting in the need for additional school facilities. No impact would occur.

a4. Parks?

Less-than-Significant Impact. Removal of the emergency bypass line through the El Modena Open Space area would occur once the new transmission main is placed into service. The emergency bypass line currently affects some existing trails through this area, and activities associated with removal of the emergency bypass line and mitigation of vegetation impacts may continue to affect these existing trails. However, upon the completion of removal and mitigation of impacts resulting from the emergency bypass line, the trails would be restored to their state prior to installation of the emergency bypass line.

As discussed in XIII-a, because the proposed project would not include the addition of housing or persons to the proposed project area and it would not induce population growth, it would not impact service ratios or performance objectives of parks in the vicinity of the proposed project area, resulting in the need for additional park facilities. Impacts would be less than significant.

a5. Other public facilities?

No Impact. The proposed project would not affect the demand for any other public services. No impact would occur.

XV. Recreation	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☒	☐
b. Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☒	☐

Discussion

a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

Less-than-Significant Impact. As discussed in XIII-a, the proposed project would not include the addition of housing or persons to the proposed project area, and it would not induce population growth. Although the proposed project does not directly increase the use of existing recreational facilities, the emergency bypass line currently affects some existing trails through this area. Activities associated with removal of the emergency bypass line and mitigation of vegetation impacts may continue to affect these existing trails. However, upon the completion of removal and mitigation of impacts resulting from the emergency bypass line, the trails would be restored to their state prior to installation of the emergency bypass line. Although a portion of these trails are currently affected and may continue to be partially inaccessible until completion of restoration and mitigation work, the diversion of any potential users of this portion of trail is minimal and would be temporary. No increased use of existing neighborhood and regional parks or other recreational facilities would occur or be accelerated. Impacts would be less than significant.

b. Does the project include recreational facilities or require the construction of or expansion of recreational facilities that might have an adverse physical effect on the environment?

No Impact. The proposed project does not include the addition of recreational facilities to the proposed project area. As discussed in XIII-a, the proposed project would not include the addition of housing or persons to the project area and it would not induce population growth. Although it may divert a small number of potential users of trail in the immediate vicinity of the emergency bypass line, it would not be sufficient to require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment. Impacts would be less than significant.

XVI. Transportation/Traffic	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a. Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☒	☐	☐
b. Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☒	☐
c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d. Substantially increase hazards because of a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☒	☐	☐
e. Result in inadequate emergency access?	☐	☒	☐	☐
f. Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☒	☐	☐

Discussion

Would the project:

a. Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

Less-than-Significant Impact with Mitigation Incorporated. Construction activities would generate construction-related traffic, which could create a temporary increase in localized traffic.

During the construction, most of the construction truck traffic would haul excavated material during the transmission main installation and demolition of the OPA reservoir.

An open trench construction method would be used to install the new transmission main and distribution pipelines within the proposed project area. Temporary lane closures may occur during trench construction that could reduce traffic to one lane where roadways are narrow, two-lane, undivided roads, and may require flagmen to direct traffic in some areas. Furthermore, temporary intersection disruptions may occur when construction crosses through intersections. Depending on the location, each open trench section is expected to be about 250 feet long for pipelines on non-arterial roadways, and approximately 150–200 feet long for pipelines along arterial roadways, with each trench expected to be 3.5 feet wide. It is anticipated that no more than two pipeline sections would be constructed concurrently. The pipeline installation is expected to occur from September 2010 to October 2011. During the construction of each pipeline section, approximately 10 trucks per day are projected to haul away the excavated spoil, and about 6 trucks per day to deliver construction materials. In addition, about 10 workers per day are expected to work at any site. As a result, the pipeline installation is projected to generate a maximum of 104 trips per day on the local road system when two pipeline sections are constructed concurrently.

Demolition of the OPA reservoir is expected to take place about 2–4 months following completion of the OPA transmission main. During the demolition, approximately 16 trucks per day would export demolished debris and import fill materials. About 10 workers per day are expected to work at the site during the peak construction period. As a result, demolition of the OPA reservoir is anticipated to contribute approximately 52 trips per day to local streets in the study area.

The potential impacts on the local roadway network from construction activities would occur primarily on local roadways within and surrounding the OPA service area that is primarily within an unincorporated area of Orange County but also includes portions of the City of Orange. Figure 3-3 shows the local roadway network in the vicinity of the project area, which is generally bounded by Santiago Canyon Road in the north and east, Chapman Avenue in the south, and Prospect Street in the west.

The primary measurement used to determine the operating quality of a roadway segment or intersection is Level of service (LOS). In general, LOS is measured by the ratio of traffic volume to capacity (V/C) or by the average delay experienced by vehicles on the facility. The quality of traffic operation is graded into one of six LOS designations: A, B, C, D, E, or F, with LOS A representing the best range of operating conditions and LOS F representing the worst. Within the City, LOS is measured by the V/C ratio for both arterial segments and intersections (City of Orange 2009). Table 3-7 presents LOS criteria and V/C ratios for roadways or intersections, as well as a general description of how drivers experience the different LOSes.

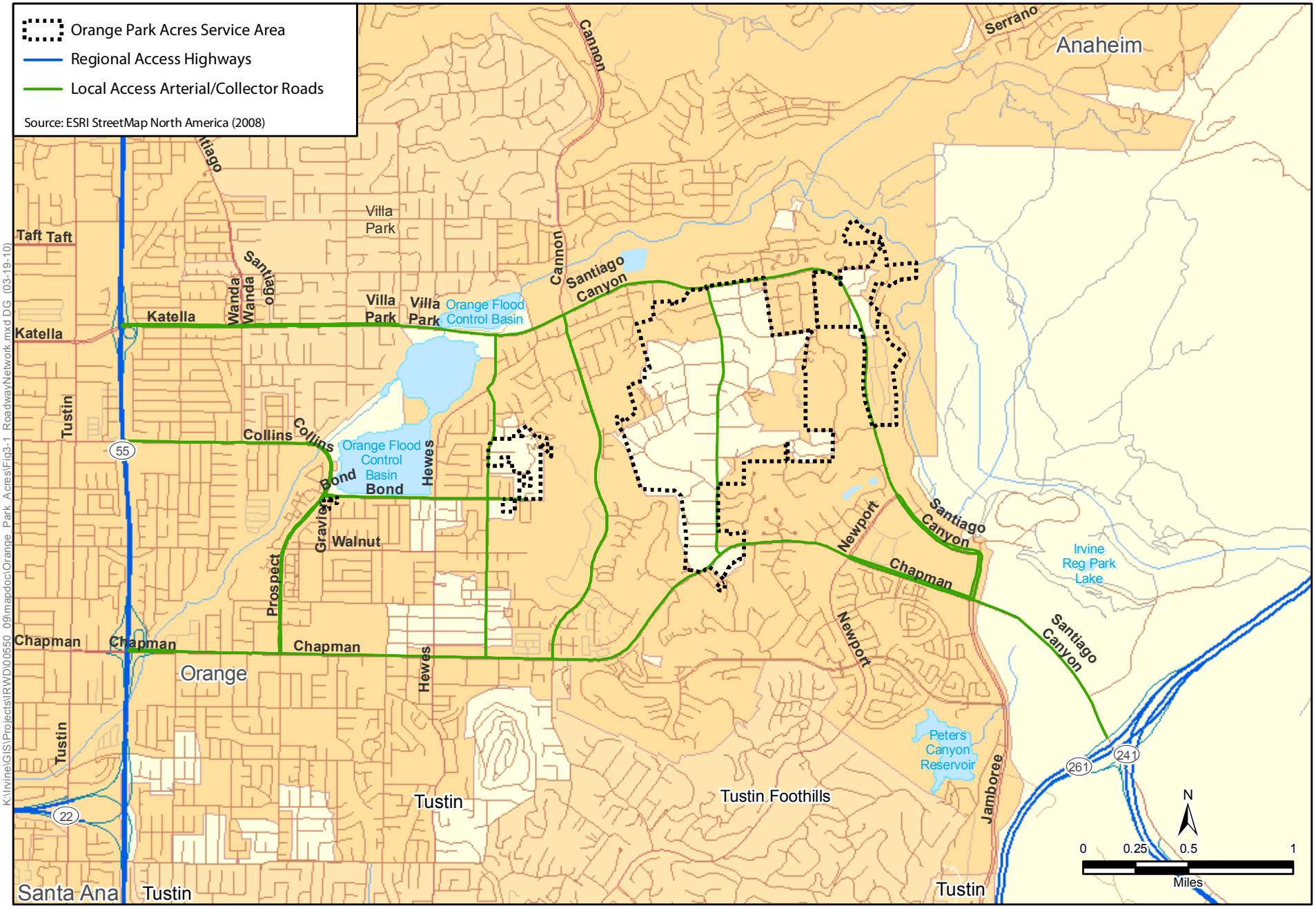

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Figure 3-3
Roadway Network in Study Area
Orange Park Acres - Domestic Water Distribution and Transmission System Improvements Project

Table 3-7. LOS Criteria on V/C Ratio

LOS	V/C Ratio	Description
A	0.00–0.60	LOS A describes operations with low control delay, up to 10 seconds per vehicle. This LOS occurs when progression is extremely favorable and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.
B	0.11–0.70	LOS B describes operations with control delay greater than 10 and up to 20 seconds per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than the LOS A, causing higher levels of delay.
C	0.71–0.80	LOS C describes operations with control delay greater than 20 and up to 35 seconds per vehicle. These higher delays may result from only fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. Cycle failure occurs when a given green phase does not serve queued vehicles, and overflows occur. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.
D	0.81–0.90	LOS D describes operations with control delay greater than 35 and up to 55 seconds per vehicle. At LOS D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, and high V/C ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	0.91–1.00	LOS E describes operations with control delay greater than 55 and up to 80 seconds per vehicle. These high delay values generally indicate poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent.
F	> 1.00	LOS F describes operations with control delay in excess of 80 seconds per vehicle. This level, considered unacceptable to most drivers, often occurs with oversaturation; that is, when arrival flow rates exceed the capacity of lane groups. It may also occur at high V/C ratios with many individual cycle failures. Poor progression and long cycle lengths may also contribute significantly to high delay levels.

Source: City of Orange 2009.

For intersections, the V/C ratio is measured based on the peak-hour traffic volume using the Intersection Capacity Utilization (ICU) methodology. For roadway segments, the V/C ratio is calculated based on the daily traffic volume with the daily roadway capacity for each type of arterial. In order to monitor roadway operations, cities and counties adopt standards by which the minimum acceptable roadway operating conditions are determined, and deficiencies identified. The City has adopted LOS D as the acceptable LOS threshold for arterial segments and intersections (City of Orange 2009). Although a portion of the OPA service area is unincorporated, the project area is included in the City's sphere of influence, and therefore, for the transportation analysis, the City's LOS standard is applied to all study area roadways within the City and the unincorporated project area.

Existing roadways within the study area are functional classified into principal arterials, major arterials, primary arterials, secondary arterial, and collectors/commuters. Table 3-8 presents the description for each roadway functional classification, including the daily capacity for each type of roadway.

Table 3-8. Roadway Facility Type

Functional Classification	Facility Type	Characteristics	LOS E Daily Capacity
Principal Arterial	8-lane divided	Primarily serves through traffic with limited local access. Connect directly to freeways and do not allow for on-street, curbside parking.	75,000
Major Arterial	6-lane divided	Serves mostly through traffic with some local access allowed. Facilitate traffic circulation and do not allow for on-street, curbside parking.	56,300
Primary Arterial	4-lane divided	Serves through and local traffic. Provide for easy circulation and allow for limited on-street, curbside parking.	37,500
Secondary Arterial	4-lane undivided	Serves mostly local traffic and allows for on-street parking.	24,000
Collector/Commuter	2-lane undivided	Serves local traffic and allows for on-street parking.	12,000

Source: City of Orange 2009.

Regional access to the OPA service area is provided to the west by SR 55 via Chapman Avenue and Katella Avenue/Santiago Canyon Road; and to the east by Santiago Canyon Road via SR 241/SR 261. The 2008 average annual daily traffic (AADT) on SR 55 ranged from 211,000 to 238,000 vehicles per day between Chapman Avenue and Katella Avenue; and the 2008 AADT on SR 241/SR 261 ranged from 33,500 to 46,000 vehicles per day at the Santiago Canyon Road interchange (Caltrans 2010). Local access within the study area that could be affected by construction of the proposed project is provided by arterials and collectors, including Chapman Avenue, Bond Avenue, Amapola Avenue, Santiago Canyon Road, Prospect Street, Rancho Santiago Boulevard, Cannon Street, and Orange Park Boulevard. Table 3-9 summarizes the daily traffic volume and LOS of road segments within the project area that were analyzed as part of the City of Orange's recent General Plan (City of Orange 2009). The table shows that the study area arterials and collectors are currently operating at or better than the City standard of LOS D.

Table 3-9. Existing Roadway Daily LOS in the Study Area

Road Name	Location	Functional Classification	2008 Daily Traffic Volumes (vehicles/day)	V/C Ratio	LOS
Chapman Avenue	Crawford Canyon Road–Newport Boulevard	Primary Arterial	16,000–26,900[1]	0.43–0.72[1]	A–C[1]
Bond Avenue	Prospect Street–Hewes Street	Secondary Arterial	6,400	0.27	A
Amapola Avenue	Orange Park Boulevard–Santiago Canyon Road	Collector	N/A[2]	N/A[2]	Better than LOS D[2]
Santiago Canyon Road	Hewes Street–Newport Boulevard	Primary Arterial	18,700–23,000[1]	0.5–0.61[1]	A–B[1]
Prospect Street	Chapman Avenue–Bond Avenue	Secondary Arterial	15,300–20,900[1]	0.64–0.87[1]	A–D[1]
Rancho Santiago Boulevard	Chapman Avenue–Bond Avenue	Collector	2,800–7,400[1]	0.23–0.62[1]	A–B[1]
Cannon Street	Chapman Avenue–Santiago Canyon Road	Secondary Arterial	4,300–8,500[1]	0.18–0.35[1]	A
Orange Park Boulevard	Chapman Avenue–Santiago Canyon Road	Collector	N/A[2]	N/A[2]	Better than LOS D[2]

[1] Roadway segment as described in City of Orange General Plan is described in multiple sub-segments each with varying traffic volumes, V/C ratios, and LOS.

[2] Traffic volumes and V/C ratios are not available. LOS is assumed to be above minimum standard.

Source: City of Orange 2009.

The City's General Plan also analyzed the intersection LOS for a.m. and p.m. peak hours at key intersections in the project area. Table 3-10 summarizes the V/C ratio and LOS of these intersections within the study area. The table shows that all analysis intersections are currently operating at LOS D or better, which meets the City's LOS standard (City of Orange 2009). However, the Santiago Canyon Road/Cannon Street intersection is approaching the LOS E at V/C ratio of 0.90.

Table 3-10. Existing Intersection Peak-Hour LOS in the Study Area

	A.M. Peak Hour		P.M. Peak Hour	
Intersection	V/C Ratio	LOS	V/C Ratio	LOS
Chapman Avenue/Prospect Street	0.87	D	0.81	D
Chapman Avenue/Cannon Street	0.63	B	0.58	A
Chapman Avenue/Newport Boulevard	0.32	A	0.36	A
Chapman Avenue/Jamboree Road	0.43	A	0.70	B
Santiago Canyon Road/Cannon Street	0.83	D	0.90	D

Source: City of Orange 2009.

The construction traffic generated by pipeline installation (maximum 104 trips per day) and demolition of the OPA reservoir (52 trips per day) would be a relatively low increase in daily traffic volumes to these roadways. Construction-related traffic is not expected to result in violation of the City's LOS standard. However, because roadway capacity may also be temporarily decreased by lane closures and intersection closures during pipeline construction, the increase in construction-related traffic is potentially significant. Implementation of **MM TR-1** would reduce impacts to a less-than-significant level.

Mitigation Measure TR-1: Develop and implement a traffic control plan for project construction. The contractor will develop and implement a traffic control plan as part of the overall construction management plan, in accordance with City and County policies. The traffic control plan will be implemented throughout the course of project construction, and may include but will not be limited to the following elements:

- Provide a plan for communicating construction plans with transit, emergency service providers, businesses, and residences located in the project vicinity, and anyone else who might be affected by project construction.
- Identify roadway segments or intersections that are at or approaching LOS that exceeds local standards, and provide for construction-generated traffic to avoid these locations at the peak periods, either by traveling different routes or by traveling at non-peak times of day.
- Provide an access and circulation plan for use by emergency vehicles when lane closures and/or detours are in effect. When lane closures occur, provide advance notice to local fire and police departments to ensure that alternative evacuation and emergency routes are designed to maintain response times.
- Maintain vehicular access to area residences and businesses at all times.
- Maintain existing non-motorized access, or provide detours and warning signs in construction areas.
- Coordinate with OCTA to temporarily close or move bus stops on Chapman Avenue during construction of segments that may impact bus stops.
- Provide for adequate parking for construction trucks and equipment within the designated staging areas throughout the construction period.
- Provide adequate parking for construction workers within the designated staging areas.
- Restrict delivery of construction materials to between the hours of 9 a.m. and 3 p.m. to avoid more congested morning and evening hours.
- Require traffic controls in the project area, including flag persons wearing bright orange or red vests and using a “Stop/Slow” paddle to control oncoming traffic.
- Require that advance notice signs of upcoming construction activities be posted at least one week in advance so that motorists can plan to avoid traveling through and/or parking in the project area when construction is underway.
- Require that construction warning signs are posted in accordance with local standards or those set forth in the MUTCD (FHWA 2001), in advance of the construction area and at any intersection that provides access to the construction area.
- Require that written notification be provided to contractors regarding appropriate routes to and from the construction site, and the weight and speed limits on local roads used to access the construction site.
- Specify that a sign be posted at all active construction areas giving the name and telephone number or email address of the staff person designated to receive complaints regarding construction traffic.
- For sites with heavy construction involved, such as the reservoir demolition site, neighboring property owners shall be notified in writing of the construction schedule, duration, and name and contact information of the appropriate IRWD representative.

- IRWD shall coordinate with the City of Orange to adjust construction schedules and locations where feasible in order to minimize potential cumulative traffic impacts with other similar constructions projects in the vicinity, including but not limited to the Bike Trail North, Santiago Canyon Road Safety improvements, the Tustin/Chapman intersection widening, and Chapman Road Rehabilitation projects.

b. Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

Less-than-Significant Impact. A congestion management program (CMP) intersection analysis is required for all freeway monitoring stations where the proposed project will add 150 or more directional peak-hour trips and at CMP monitoring intersections where the proposed project would add more than 50 peak-hour trips. The nearest CMP segments are along SR 55, and the nearest CMP intersection is at SR 55 at Katella Avenue. As discussed in XVI-a, the proposed project would generate a maximum of approximately 104 trips per day during construction. The proposed project would generate a relatively low amount of construction traffic, and as such, no CMP mainline freeway segment or monitoring intersection impacts are identified. Impacts would be less than significant.

c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

No Impact. Construction and operation of the proposed project involves improvements to the domestic water system in the OPA service area and would not impact air traffic patterns. The nearest airport is John Wayne Airport, approximately 10 miles to the southwest of the project site, and Fullerton Municipal Airport is located approximately 11 miles to the northwest. The proposed project is not located within an airport land use plan area or within 2 miles of a public airport or public use airport. The proposed project would not result in a change in air traffic patterns or result in a change that results in safety risks. No impact would occur.

d. Substantially increase hazards because of a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Less-than-Significant Impact with Mitigation Incorporated. Safety impacts are considered significant if design elements of the proposed project or proposed project construction would result in conditions that would increase the risk of accidents, either for vehicular or non-motorized traffic. Elements that could result in safety impacts include poor sight distance, sharp curves, or substantial differences in speed between construction-related and general-purpose traffic. No obstacles to sight distance would result from project construction. The maneuvering of construction-related vehicles and equipment among the general-purpose traffic on local streets could cause safety hazards and temporary lane closures could affect non-motorized travel along the affected road segments. This impact is considered potentially significant. Implementation of **MM TR-1** would reduce impacts to a less-than-significant level.

e. Result in inadequate emergency access?

Less-than-Significant Impact with Mitigation Incorporated. A significant impact would occur if the proposed project failed to maintain emergency access and circulation at all times or caused an increase in response times. Emergency access to the project vicinity could be affected by project construction. Temporary lane closures and construction-related traffic could delay or obstruct the

movement of emergency vehicles. This impact is considered potentially significant. Adequate emergency access routes must be maintained at all times during construction and after the proposed project is completed. Implementation of **MM TR-1** would reduce impacts to a less-than-significant level.

f. Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

Less-than-Significant Impact with Mitigation Incorporated. In Orange County and the City of Orange, transit service is provided by the Orange County Transportation Authority (OCTA). One bus route, Route 54, provides service within the study area and runs on Chapman Avenue where the proposed transmission main would be installed (City of Orange 2009). Within the study area where the proposed transmission main would be installed, a separated bike path is provided along the portion of Rancho Santiago Boulevard. The striped bike lanes are provided on Chapman Avenue and Orange Park Boulevard; and a signed bike route is provided along the portion of Cannon Street (City of Orange 2009). Construction would require a lane closure in a maximum of 200-foot long increments per day. No full road closures would occur, so buses could stay on route. However, installation of the transmission main along Chapman Avenue could potentially result in delays of buses along this route. Bicycle facilities on Chapman Avenue, Orange Park Boulevard, and Cannon Street in the study area may also be affected by the lane closures. Implementation of **MM TR-1** would reduce impacts to a less-than-significant level.

XVII. Utilities and Service Systems	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c. Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or would new or expanded entitlements be needed?	☐	☐	☐	☒
e. Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐
g. Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

Discussion

Would the project:

a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

No Impact. As described in XIII-a, the proposed project would not include new homes or businesses and would not induce population growth. The proposed project is a replacement of existing domestic water system facilities intended to increase pressures and flows and the reliability of domestic water service provided to residents within the OPA service area. The proposed project would also include a domestic water service connection to the future East Orange and Santiago Hills II planning areas. The wastewater generated by these developments has already been separately analyzed in an EIR prepared and adopted by the City of Orange in November 2005. The proposed project would not induce population growth, would not add any new source of wastewater that

would require treatment, and would not cause any existing wastewater source to exceed treatment requirements of the SARWQCB. No impact would occur.

b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

No Impact. As described in XIII-a, the proposed project is a replacement of existing domestic water system facilities intended to increase pressures and flows and the reliability of domestic water service provided to residents within the OPA service area. Existing treatment systems are in place for the source water and no other element of the proposed project would result in the new construction or expansion of water or wastewater treatment facilities. No impact would occur.

c. Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

No Impact. The proposed project would not affect existing stormwater drainage facilities, nor would the project increase the rate or volume of stormwater flows that would require the need to new facilities. No impact would occur.

d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or would new or expanded entitlements be needed?

No Impact. The proposed project is a replacement of existing domestic water system facilities intended to increase pressures and flows and the reliability of domestic water service provided to residents within the OPA service area. The proposed project would not increase the supply delivered to the service area, and would not involve new entitlements for additional source water. While the proposed project would include a domestic water service connection to the future East Orange and Santiago Hills II planning areas, the domestic water demand for these developments has already been separately analyzed in an EIR prepared and adopted by the City of Orange in November 2005. No element of the proposed project would result in an increase in the demand for water supplies. No impact would occur.

e. Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

No Impact. The proposed project would not generate wastewater or the need to treat additional wastewater. No impact would occur.

f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

Less-than-Significant Impact. Construction activities would generate solid waste in the form of material excavated from trenching activities, old transmission main pipeline, and concrete from demolition of the OPA reservoir. These activities are anticipated to generate a total of approximately 10,100 cubic yards (or about 4,300 tons, assuming approximately 850 pounds per cubic yard) of solid waste throughout all three phases of construction. Where possible, materials such as concrete from the OPA reservoir would be beneficially reused.

Three landfills exist in the vicinity of the proposed project: the Frank R. Bowerman Landfill in Irvine, the Olinda Alpha Landfill in Brea, and the Prima Deshecha Landfill in San Juan Capistrano. In total

these facilities are permitted to accept 23,500 tons of solid waste per day and are scheduled to continue accepting waste throughout the entire length of project construction activities. Assuming the worst-case scenario in which no materials are beneficially reused, the total solid waste disposal needs of the proposed project could still be accommodated by any combination of the three landfills in the vicinity of the proposed project.

As described in XIII-a, the proposed project would not include new homes or businesses and would not induce population growth. Furthermore, operation of the proposed project would be the same as existing conditions and would not generate solid waste. Impacts would be less than significant.

g. Comply with federal, state, and local statutes and regulations related to solid waste?

No Impact. Prior to reuse or disposal, solid waste materials such as ACP pipeline would be analyzed for contaminants. If materials are determined to be contaminated, they would be transferred to and disposed of at a hazardous waste treatment facility using appropriately licensed hauling equipment according to federal, state, and local regulations. Furthermore, as described in XIII-a, the proposed project would not include new homes or businesses and would not induce population growth. Operation of the proposed project would be the same as existing conditions and would not generate solid waste. Therefore, no conflicts with federal, state, and local statutes and regulations related to solid waste would be anticipated. No impact would occur.

XVIII. Mandatory Findings of Significance	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b. Does the project have impacts that are individually limited but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☐	☒	☐	☐
c. Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

Discussion

a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?

Less-than-Significant Impact with Mitigation Incorporated. The proposed project may adversely affect biological resources and cultural resources. However, implementation of **MM BIO-1** through **MM BIO-9,** and **MM CR-1** through **MM CR-3** would reduce these impacts to a less-than-significant level.

b. Does the project have impacts that are individually limited but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)

Less-than-Significant Impact with Mitigation Incorporated. Due to its limited size and magnitude, the proposed project, in conjunction with other area projects, would not result in cumulative impacts on the physical environment, with the exception of impacts on biological resources and transportation and traffic. However, implementation of **MM BIO-1** through **MM BIO-9** and **MM TR-1** would reduce the proposed project's cumulative contribution to significant impacts

to a less-than-significant level. Furthermore, as specified in MM TR-1, IRWD and the construction contractor will coordinate with the City regarding construction schedules and will adjust timing and location where feasible to minimize possible traffic impacts with other roadway projects in the vicinity. Therefore, impacts would not be cumulatively considerable.

c. Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?

Less-than-Significant Impact with Mitigation Incorporated. Based on the analysis of the above-listed topics, the proposed project would have potentially significant environmental effects on public services, hazards and hazardous materials, and transportation and traffic that could cause substantial adverse effects on human beings, either directly or indirectly. However, implementation of **MM HM-1** and **MM TR-1** would reduce these impacts to a less-than-significant level. No other direct or indirect adverse effects on human beings have been identified.

Chapter 4
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Chapter 5
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Appendix A

Santiago Waterline Restoration Plan

SANTIAGO WATERLINE RESTORATION PLAN

Prepared for:

IRVINE RANCH WATER DISTRICT
15600 Sand Canyon Avenue
Irvine, California 92618

Prepared by:

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December 2008

TABLE OF CONTENTS

1.0 INTRODUCTION

The Irvine Ranch Water District (IRWD) owns and operates a domestic waterline, the Santiago Waterline, in the City of Orange, Orange County California. The Santiago Waterline is a 16-Inch Riveted Steel Main line that serves residents in the City of Orange. The 1929 steel riveted main is in very poor condition. IRWD is planning for a complete replacement of the 16-inch main between Bond Street and east Orange Park Acres. The exact location of where the main will be relocated to is not known at this time, and it is anticipated this relocation will not take place for another two years. Due to the persistent leaks and the existing condition of the pipe, an emergency bypass waterline was installed to replace the existing waterline. The emergency bypass line was installed as per agency approved protocols.

Installation resulted in temporary impacts to native habitats both within and outside the NCCP Reserve. Temporary impacts will be restored as per this plan and as approved by NROC, County of Orange and Wildlife Agencies. All impacted cactus will be salvaged and re-planted within the disturbed area as part of this plan.

IRWD will co-ordinate with the NROC, County of Orange and Wildlife Agencies prior to re-locating the emergency bypass line. In addition, these agencies will also be contacted during the CEQA process. IRWD will need to obtain CPP No. 2008-01531 Rider #2 prior to removal of the bypass line. Re-location of the emergency bypass line will be conducted in accordance with NCCP construction-related minimization measures (Pursuant to Mitigation Monitoring Program §10.1, items 1 through 6); and a monitoring biologist will be present during all construction activity to ensure compliance with the NCCP IA.

1.1 Site location

The project site is located approximately between Patrica Circle and Glen Albyn Lane, in the City of Orange, Orange County California. A portion of the Santiago Waterline, between Patrica Circle and Glen Albyn Lane, runs through El Modena Open Space. Portions of the El Modena Open Space lie within the reserve area of the Orange County Natural Community Conservation Plan (NCCP/HCP) Central/Coastal Subregion; Central Subarea (Figures 1 and 2).

The site consisted of high quality mature coastal sage scrub (CSS), dominated by California sagebrush (*Artemisia californica*), coastal buckwheat (*Eriogonum fasciculatum var. fasciculatum*), coyote brush (*Baccharis pilularis*), monkey flower (*Mimulus aurantiacus*) and black sage (*Salvia mellifera*) and; high quality cactus scrub dominated by coast prickly pear cactus (*Opuntia littoralis*) and coastal cholla (*Opuntia prolifera*). Laurel sumac (*Malosma laurina*), lemonadeberry (*Rhus integrifolia*) and toyon (*Heteromeles arbutifolia*) were also present. A small area of disturbed non-native grassland was also present adjacent Cannon Street.

The site provides suitable habitat for, and is occupied by, the California gnatcatcher (*Polioptila californica californica*) and coastal cactus wren (*Campylorhynchus brunneicapillus couesi*). At least one pair of each species was present on site as documented by both direct observation during recent site visits and location of recently active nests. One Conditionally Covered species, intermediate mariposa lily (*Calochortus weedii var. intermedius*), is also know to occur onsite.

1.2 Project impacts

Impacts occurred to vegetation within the NCCP Reserve, to El Modena Open Space outside the Reserve and to areas outside both the reserve and the open space. In addition, portions of a county trail were damaged. Impacts to the CSS were primarily flattened and damage bushes but also included crushed bushes and cleared areas. Impacts to the cactus scrub were primarily flattened and crushed cactus and cleared areas. Cactus was also impacted where the pipe was laid on top of cactus.

Impacts to NCCP Reserve totaled approximately 0.3 acres; consisting of impacts to 0.07-acres of CSS, 0.05-acres of cactus scrub and 0.18-acres of sparse CSS along the old dirt road.

Impacts to El Modena Open Space outside the Reserve System totaled approximately 0.36 acres; consisting of impacts to 0.08-acres of CSS, 0.05-acres of cactus scrub and 0.17-acres of sparse CSS along the old dirt road and 0.06-acres of non-native grassland.

Impacts to areas outside both the reserve and the open space totaled approximately 0.06-acres; consisting of impacts to 0.05-acres of non-native grassland with sparse buckwheat bushes and 0.01-acres of county trail. Some landscaped areas were also impacted.

After re-location of the emergency bypass line the biologist will re-assess site impacts and provide IRWD, NROC, County of Orange and Wildlife Agencies with a final accounting of all project impacts for both phases of the work.

1.3 Mitigation measures

All disturbed ares will be restored on site with native CSS or cactus scrub species. As approved by NROC, CDFG, USFWS and County of Orange the restoration plan will occur in two phases, Phase 1 after complete installation of the emergency bypass line and Phase 2 after complete removal of the emergency bypass line. All damaged, disturbed and cleared areas will be restored to CSS or cactus scrub during Phase 1 or Phase 2 of the restoration plan; including damage to the County Trial from Patrica Court to the open space boundary (during Phase 1 restoration), as per the overview below.

<u>Phase 1 restoration:</u>

The Phase 1 restoration plan will be implemented in 2008 immediately after project completion. The plan will include, at a minimum;

- All cleared areas will be restored to their original contours,
- Restoration areas will include all cleared and damaged areas and the old dirt road,
- Cleared areas and portions of the dirt road required for the ultimate pipe removal work will be actively restored and will be included in the exotic weed control program, but it is understood that these areas will be disturbed again during pipeline removal,
- Restoration areas will be restored to CSS/cactus scrub, after project completion,
- Salvaged cactus will restored (planted) to areas cleared of cactus scrub,
- Restoration will include hand seeding with an appropriate CSS mix after project completion. All restoration areas, including CSS, cactus scrub and non-native grassland areas, will be seeded with CSS. Hand seeding of CSS will take place after completion of the work and will be timed to coincide with natural rainfall.
- Weeding will be conducted in all cleared, damaged areas including the seeded areas, as necessary, during the first three years after seeding,
- IRWD will monitor the site for 5 years, or until the project success criteria have been achieved, and annual reports will be submitted to NROC, Wildlife Agencies and County of Orange,
- The restored CSS/cactus scrub will have 75% cover of native species and less than 5% cover of invasive weeds within five years after seeding.

<u>Phase 2 restoration:</u>

IRWD will co-ordinate with the NROC, County of Orange and Wildlife Agencies prior to re-locating the emergency bypass line. Re-location of the emergency bypass line will be conducted in accordance with NCCP construction-related minimization measures (Pursuant to Mitigation Monitoring Program §10.1, items 1 through 6); and a monitoring biologist will be present during all construction activity to ensure compliance with the NCCP IA.

The Phase 2 restoration plan will be implemented in fall prior to the first rain season after complete removal of the emergency bypass line. The plan will include, at a minimum;

- All newly cleared/damaged areas will be restored to their original contours,
- Restoration areas will include all areas underneath the emergency bypass line, all newly cleared/damaged areas, any areas restored during Phase 1 that are disturbed and any cleared/damaged areas within the work area not restored during Phase 1,
- A portion of the old dirt road will remain open as a public access hiking trail, if approved by County Staff,
- Restoration areas will be restored to CSS/cactus scrub, after project completion,
- If available, salvaged cactus will be restored to areas cleared of cactus scrub, and as necessary, additional cactus container plantings will be used to supplement salvaged cactus,

- Restoration will include hand seeding with an appropriate CSS mix after project completion. All restoration areas, including CSS, cactus scrub and non-native grassland areas, will be seeded with CSS. Hand seeding of CSS will take place after completion of the work and will be timed to coincide with natural rainfall.
- Weeding will be conducted in all cleared, damaged areas including the seeded areas, as necessary, during the first three years after seeding,
- IRWD will monitor the site for 5 years, or until the project success criteria have been achieved, and annual reports will be submitted to NROC, Wildlife Agencies and County of Orange,
- The restored CSS/cactus scrub will have 75% cover of native species and less than 5% cover of invasive weeds within five years after seeding.

2.0 PHASE 1 RESTORATION PLAN

The Phase 1 restoration plan will be implemented in 2008 immediately after completion of all project work. The restoration areas will include all cleared and damaged areas and disturbed portions of the old dirt road. Areas likely required during the ultimate removal of the temporary bypass line will be included in the restoration area and in the exotic weed control program. This will ensure that exotic weeds do not become established in these areas. However, it is understood that these areas will be disturbed again during pipeline removal work and then restored during the Phase 2 restoration work.

2.1 Site preparation

Site preparation will be conducted immediately after completion of pipeline work. Site preparation will include restoring all contours to their original condition. Site preparation shall also consist of clearing and controlling exotic plants, removing debris, and doing any other work necessary to make the area ready for planting. The soil surface shall be roughened with hand tools to allow suitable seed/soil contact.

2.2 County trail restoration

Any portions of the county trail that were damaged shall be restored to their original condition. That will include restoring contours, steps, surface condition, edging and any trail signs. Prior to restoring the trail an onsite meeting with IRWD Construction Manager, contractor, biologist, Park Ranger and County Inspector will be held to ensure appropriate trail restoration and placement of signs.

2.3 Cactus planting

Once the site preparation is completed the salvaged cactus shall be planted. Cactus will only be planted in areas not planned to be disturbed in the future (areas likely required during the ultimate removal of the temporary bypass line will not be planted with cactus). Cactus salvaged during the pipeline work will be planted in appropriate areas following standard protocols (Dodero 2008[1]; Endress pers.com.[2]). Basically this involves locating cactus pads and stems in contact with native soil in appropriate areas. Any cactus stem or pad can form roots and ultimately a new cactus plant. Larger cactus pads will be placed either vertically or horizontally with 1/3 of the pad below the soil. Both methods will be tracked to assess which method is more successful. Cactus plantings will be hand watered if winter rains are below average.

[1] Guidelines of cactus salvage and propagation. Mark Dodero, RECON Environmental, Inc. 10/20/2008.

[2] Bryan Endress has reported greater success when planting large cactus pads either vertically or horizontally with 1/3 of the pad below the soil.

2.4 Site seeding

The site shall be seeded with native species similar to those in CSS and cactus scrub habitats within the immediate vicinity of the impact areas. The seed mix will include significant quantities of native shrubs such as California sagebrush, California buckwheat, but also native grasses, herbaceous understory species and early successional shrubs (such as deerweed), grasses and wildflowers (Table 1). This will ensure a good early vegetation coverage of the site while the dominant shrubs mature.

All seeds will be obtained from a local seed source and include only native plants. All areas, including disturbed and non-native grassland will be restored with a CSS seed mix.

The seed mix shall be applied by handbroadcasting and/or raking. Seeding will take place after cactus planting and between the months of October through January in order to take advantage of favorable planting conditions. However, if necessary seeding may be delayed into early March, if late rains are expected.

No irrigation system is planned but if the winter is unusually dry then the seeded areas will be watered from a water truck.

Container Plants

One-gallon container stock shall be utilized for the large shrubs (Table 2). All plant materials shall be inspected by the revegetation specialist and approved as healthy, disease free, and of proper size prior to planting. Overgrown, root-bound container stock will be rejected. All container stock shall come from experienced native plant nursery located in the same climate zone as the project site. Substitution of plant material at the time of planting depends solely upon the discretion of the revegetation specialist. Container plants will be individually watered during the first winter, as necessary.

2.5 Signs, site protection

After meeting with the Park Ranger and County Inspector, trail closure signage and signs notifying and identifying the restoration areas will be installed. In addition, erosion control measures will be installed where necessary.

2.6 Site maintenance

The site will be checked by the restoration biologist regularly during the first 5 years after installation to verify site conditions, inspect status of planted and seeded vegetation and to determine the need for weeding. Weeding will be conducted, as necessary, in all cleared, damaged areas including the seeded areas, during the first three years after seeding.

Table 1: Seed mix for the Santiago Waterline.

Scientific name	Common name	Lbs./acre
Eriogonum fasciculatum	California Buckwheat	6.0
Artemisia californica	California Sagebrush	2.0
Nassella lepida	Foothill Needlegrass	1.0
Eriophyllum confertiflorum	Golden Yarrow	1.0
Vulpia microstachys	Three Week Fescue	2.0
Lotus scoparius	Deerweed	4.0
Lasthenia glabrata	Coast Goldfields	1.0
Salvia columbariae	Chia	1.0
Lupinus succulentus	Arroyo Lupine	1.0
Sisyrinchium bellum	Blue-eyed Grass	0.50
Deinandra fasciculatum	Fascicled Tarweed	2.0
Emmenanthe penduliflora	Whispering Bells	0.25
Eucrypta chrysanthemifolia	Common Cryptantha	0.50
Calystegia macrostegia	Morning Glory	0.25
Cryptantha intermedia	Popcorn Flower	0.50
Antirrhinum nuttallianum	Nuttall's Snapdragon	0.50
Salvia mellifera	Black Sage	1.25
Encelia californica	California Sunflower	2.0
Mimulus aurantiacus	Sticky Monkey Flower	1.0
Baccharis pilularis	Coyote Brush	0.50
Linanthus dianthiflorus	Ground Pink	0.50
	Total	26.75

Table 2: Container plantings for large shrubs for the Santiago Waterline.

Scientific Name	**Common Name**	**No. of Plants**
Heteromeles arbutifolia	Toyon	5 - 1 gallon plants
Malosma laurina	Laurel sumac	5 - 1 gallon plants
Rhus integrifolia	Lemonadeberry	5 - 1 gallon plants
Sambucus mexicana	Mexican elderberry	5 - 1 gallon plants

2.7 Monitoring program

IRWD will monitor the site for 5 years, or until the project success criteria have been achieved. A qualified habitat revegetation specialist with appropriate credentials and experience in native habitat revegetation shall conduct the monitoring. This program is intended to provide continued oversight of the site after installation is completed. This

oversight shall accomplish two objectives: 1) provide feedback for the landscape maintenance; and 2) provide information to evaluate project progress.

Monitoring for the revegetation/enhancement program shall occur in the following manner:

Careful records shall be made of the species, quantities, and locations of all vegetation, as well as methods used and the exotics removed. Any significant problems encountered, such as site conditions unsuitable for planting, shall be recorded. A photographic record of the site shall be kept from the time of the initial planting, through the end of the monitoring program.

After initial planting, the area shall be checked monthly by a qualified biologist for the first six months, and quarterly thereafter. During these monthly and quarterly checks, any unsuccessful plantings shall be replaced as needed to bring the areas into overall compliance with the minimum success standards.

Other potential site problems, such as weed infestation and soil loss, should also be identified by the project monitor. Remedial measures addressing these problems shall be designed by the revegetation specialist, submitted to IRWD, and implemented by the maintenance crew.

Monitoring shall assess the attainment of annual and final success criteria and identify the need to implement contingency measures in the event of failure. Botanical monitoring methods include field sampling techniques which are based upon the California Native Plant Society field sampling protocol.[3] Please refer to *A Manual of California Vegetation* for further details on this sampling method.

Annual monitoring reports will be submitted to NROC, Wildlife Agencies and County of Orange by December 31. Monitoring reports will summarize site activities, document cover of native species and of invasive weeds, health and success of salvaged cactus, identify any problems areas, proposed solutions and achievement towards the project success criteria. Monitoring reports will be submitted for at least five years after seeding or until the project success criteria have been achieved.

2.8 Performance standard

The restored CSS/cactus scrub will have 75% cover of native species and less than 5% cover of invasive weeds within five years after seeding.

3 Sawyer, John O. And Todd Keeler-Wolf. 1995. *A Manual of California Vegetation*. California Native Plant Society.

3.0 PHASE 2 RESTORATION PLAN

The Phase 2 restoration plan will be implemented after completion of ultimate removal of the temporary bypass line. IRWD will co-ordinate with the NROC, County of Orange and Wildlife Agencies prior to re-locating the emergency bypass line. IRWD will need to obtain CPP No. 2008-01531 Rider #2 prior to removal of the bypass line. Re-location of the emergency bypass line will be conducted in accordance with NCCP construction-related minimization measures (Pursuant to Mitigation Monitoring Program §10.1, items 1 through 6); and a monitoring biologist will be present during all construction activity to ensure compliance with the NCCP IA.

The restoration areas will include all newly cleared and damaged areas. NROC, Wildlife Agencies and County of Orange will be notified prior to ultimate removal of the temporary bypass line and prior to any restoration activity.

3.1 Site preparation

Site preparation will be conducted immediately after completion of pipeline work. Site preparation will include restoring all contours to their original condition. Site preparation shall also consist of clearing and controlling exotic plants, removing debris, and doing any other work necessary to make the area ready for planting. The soil surface shall be roughened with hand tools to allow suitable seed/soil contact.

3.2 Cactus planting

Once the site preparation is completed the cactus shall be planted. If salvaged cactus is available, either onsite or from nearby development areas, then that salvaged cactus will be used. In the absence of salvaged cactus, 1-gallon container cactus will be planted. Cactus will be planted in appropriate areas following standard protocols (Dodero 2008), which basically involves locating cactus pads and stems in contact with native soil in appropriate areas or in standard planting of 1-gallon container plants.

3.3 Site seeding

The site shall be seeded with native species similar to those in CSS and cactus scrub habitats within the immediate vicinity of the impact areas. The seed mix will include significant quantities of native shrubs such as California sagebrush, California buckwheat, but also native grasses, herbaceous understory species and early successional shrubs (such as deerweed), grasses and wildflowers (Table 1). This will ensure a good early vegetation coverage of the site while the dominant shrubs mature.

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3.4 Signs, site protection

After meeting with the Park Ranger and County Inspector trail closure signage and signs notifying and identifying the restoration areas will be installed. In addition, erosion control measures will be installed where necessary.

3.5 Site maintenance

The site will be checked by the restoration biologist regularly during the first 5 years after installation to verify site conditions, inspect status of planted and seeded vegetation and to determine the need for weeding. Weeding will be conducted, as necessary, in all cleared, damaged areas including the seeded areas, during the first three years after seeding.

3.6 Monitoring program

IRWD will monitor the site for 5 years, or until the project success criteria have been achieved. A qualified habitat revegetation specialist with appropriate credentials and experience in native habitat revegetation shall conduct the monitoring. This program is intended to provide continued oversight of the sites after installation is completed. This oversight shall accomplish two objectives: 1) provide feedback for the landscape maintenance; and 2) provide information to evaluate project progress.

Monitoring for the revegetation/enhancement program shall occur in the following manner:

Careful records shall be made of the species, quantities, and locations of all vegetation, as well as methods used and the exotics removed. Any significant problems encountered, such as site conditions unsuitable for planting, shall be recorded. A photographic record of the site shall be kept from the time of the initial planting, through the end of the monitoring program.

After initial planting, the area shall be checked monthly by a qualified biologist for the first six months, and quarterly thereafter. During these monthly and quarterly checks, any unsuccessful plantings shall be replaced as needed to bring the areas into overall compliance with the minimum success standards.

Other potential site problems, such as weed infestation and soil loss, should also be identified by the project monitor. Remedial measures addressing these problems shall be designed by the revegetation specialist, submitted to the owner, and implemented by the maintenance crew.

Monitoring shall assess the attainment of annual and final success criteria and identify the need to implement contingency measures in the event of failure. Botanical monitoring methods include field sampling techniques which are based upon the California Native Plant Society field sampling protocol.[4] Please refer to *A Manual of California Vegetation* for further details on this sampling method.

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3.7 Performance standard

The restored CSS/cactus scrub will have 75% cover of native species and less than 5% cover of invasive weeds within five years after seeding.

4 Sawyer, John O. And Todd Keeler-Wolf. 1995. *A Manual of California Vegetation*. California Native Plant Society.

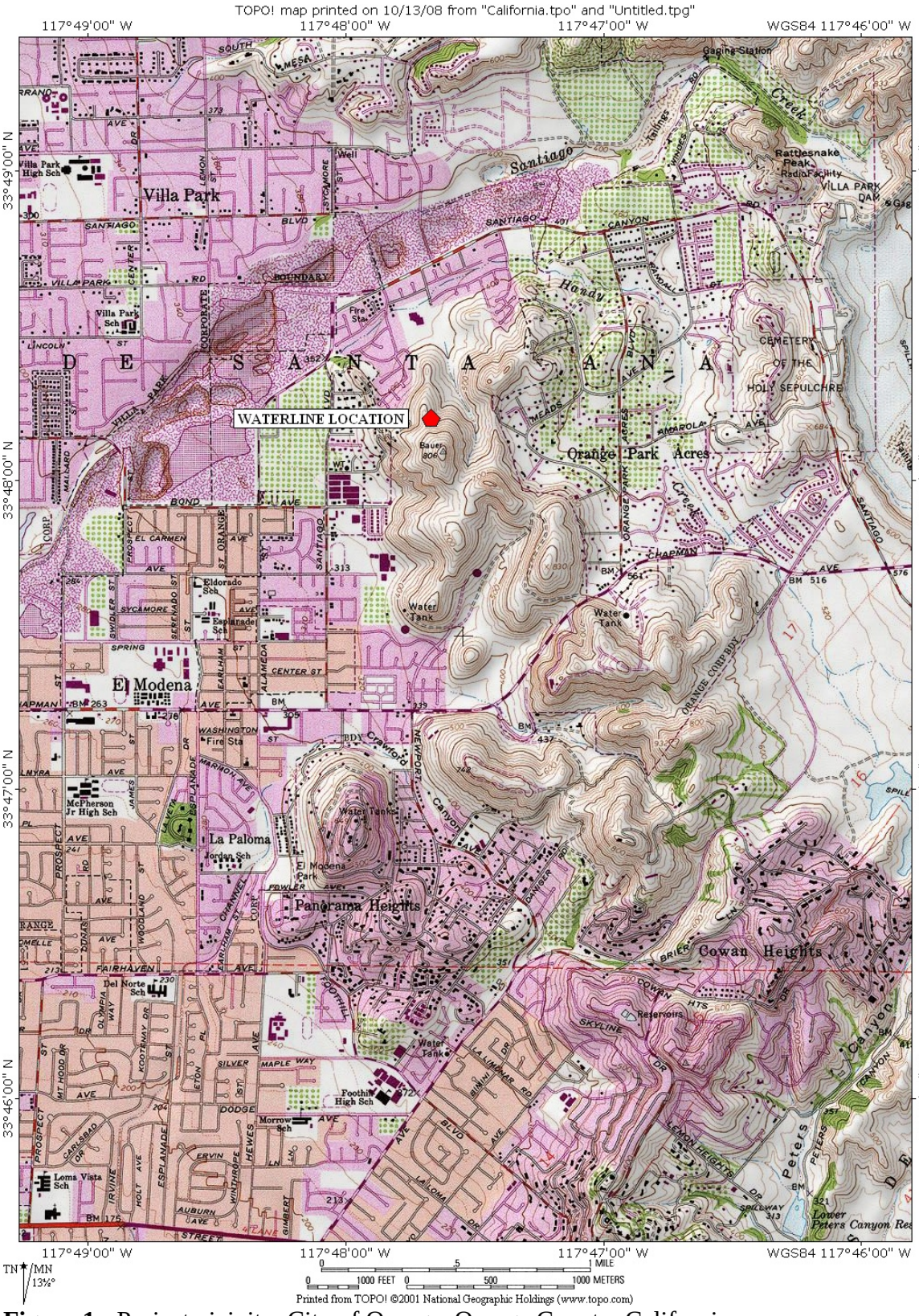

Figure 1: Project vicinity, City of Orange, Orange County, California.

Figure 2: El Modena Open Space and emergency bypass line (red line).

Appendix B

Air Quality Calculations

3/2/2010 12:31:41 PM

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name:

Project Name: IRWD OPA

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (lbs/day unmitigated)	5.02	43.93	20.62	0.01	0.64	2.11	2.75	0.14	1.94	2.08	5,127.00
2011 TOTALS (lbs/day unmitigated)	9.37	88.03	37.59	0.01	0.64	3.91	4.43	0.14	3.60	3.71	10,446.08

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

3/2/2010 12:31:41 PM

Time Slice 9/1/2010-11/30/2010 Active Days: 65	3.65	33.07	15.21	**0.01**	**0.64**	1.48	2.13	**0.14**	1.37	1.50	4,056.98
Mass Grading 09/01/2010-02/28/2011	3.65	33.07	15.21	0.01	0.64	1.48	2.13	0.14	1.37	1.50	4,056.98
Mass Grading Dust	0.00	0.00	0.00	0.00	0.61	0.00	0.61	0.13	0.00	0.13	0.00
Mass Grading Off Road Diesel	3.22	28.15	11.27	0.00	0.00	1.28	1.28	0.00	1.18	1.18	3,155.18
Mass Grading On Road Diesel	0.37	4.80	1.84	0.01	0.02	0.20	0.22	0.01	0.18	0.19	653.01
Mass Grading Worker Trips	0.07	0.12	2.10	0.00	0.01	0.01	0.02	0.00	0.01	0.01	248.79
Time Slice 12/1/2010-12/31/2010 Active Days: 23	5.02	43.93	20.62	**0.01**	**0.64**	2.11	2.75	**0.14**	1.94	2.08	5,127.00
Building 12/01/2010-08/01/2011	1.37	10.86	5.40	0.00	0.00	0.62	0.62	0.00	0.57	0.57	1,070.02
Building Off Road Diesel	1.37	10.86	5.40	0.00	0.00	0.62	0.62	0.00	0.57	0.57	1,070.02
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading 09/01/2010-02/28/2011	3.65	33.07	15.21	0.01	0.64	1.48	2.13	0.14	1.37	1.50	4,056.98
Mass Grading Dust	0.00	0.00	0.00	0.00	0.61	0.00	0.61	0.13	0.00	0.13	0.00
Mass Grading Off Road Diesel	3.22	28.15	11.27	0.00	0.00	1.28	1.28	0.00	1.18	1.18	3,155.18
Mass Grading On Road Diesel	0.37	4.80	1.84	0.01	0.02	0.20	0.22	0.01	0.18	0.19	653.01
Mass Grading Worker Trips	0.07	0.12	2.10	0.00	0.01	0.01	0.02	0.00	0.01	0.01	248.79

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Time Slice 1/3/2011-2/28/2011 Active Days: 41	4.66	40.41	19.67	**0.01**	**0.64**	1.95	2.59	**0.14**	1.79	1.93	5,126.94
Building 12/01/2010-08/01/2011	1.26	10.08	5.21	0.00	0.00	0.59	0.59	0.00	0.54	0.54	1,070.02
Building Off Road Diesel	1.26	10.08	5.21	0.00	0.00	0.59	0.59	0.00	0.54	0.54	1,070.02
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading 09/01/2010-02/28/2011	3.40	30.34	14.45	0.01	0.64	1.36	2.00	0.14	1.25	1.39	4,056.93
Mass Grading Dust	0.00	0.00	0.00	0.00	0.61	0.00	0.61	0.13	0.00	0.13	0.00
Mass Grading Off Road Diesel	3.00	25.90	10.84	0.00	0.00	1.18	1.18	0.00	1.08	1.08	3,155.18
Mass Grading On Road Diesel	0.34	4.32	1.66	0.01	0.02	0.17	0.20	0.01	0.16	0.17	653.01
Mass Grading Worker Trips	0.06	0.11	1.95	0.00	0.01	0.01	0.02	0.00	0.01	0.01	248.74
Time Slice 3/1/2011-4/29/2011 Active Days: 44	4.72	38.91	18.04	0.00	0.00	2.03	2.03	0.00	1.87	1.87	4,511.73
Building 03/01/2011-09/30/2011	3.46	28.84	12.83	0.00	0.00	1.44	1.44	0.00	1.33	1.33	3,441.71
Building Off Road Diesel	3.46	28.84	12.83	0.00	0.00	1.44	1.44	0.00	1.33	1.33	3,441.71
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building 12/01/2010-08/01/2011	1.26	10.08	5.21	0.00	0.00	0.59	0.59	0.00	0.54	0.54	1,070.02
Building Off Road Diesel	1.26	10.08	5.21	0.00	0.00	0.59	0.59	0.00	0.54	0.54	1,070.02
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Time Slice 5/2/2011-8/1/2011 Active Days: 66	**9.37**	**88.03**	**37.59**	0.00	0.52	**3.91**	**4.43**	0.11	**3.60**	**3.71**	**10,446.08**
Building 03/01/2011-09/30/2011	3.46	28.84	12.83	0.00	0.00	1.44	1.44	0.00	1.33	1.33	3,441.71
Building Off Road Diesel	3.46	28.84	12.83	0.00	0.00	1.44	1.44	0.00	1.33	1.33	3,441.71
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building 12/01/2010-08/01/2011	1.26	10.08	5.21	0.00	0.00	0.59	0.59	0.00	0.54	0.54	1,070.02
Building Off Road Diesel	1.26	10.08	5.21	0.00	0.00	0.59	0.59	0.00	0.54	0.54	1,070.02
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Demolition 05/01/2011-08/01/2011	4.65	49.11	19.55	0.00	0.52	1.88	2.40	0.11	1.73	1.84	5,934.36
Fugitive Dust	0.00	0.00	0.00	0.00	0.50	0.00	0.50	0.10	0.00	0.10	0.00
Demo Off Road Diesel	4.54	48.42	17.37	0.00	0.00	1.85	1.85	0.00	1.70	1.70	5,597.32
Demo On Road Diesel	0.05	0.58	0.22	0.00	0.00	0.02	0.03	0.00	0.02	0.02	88.30
Demo Worker Trips	0.06	0.11	1.95	0.00	0.01	0.01	0.02	0.00	0.01	0.01	248.74
Time Slice 8/2/2011-9/30/2011 Active Days: 44	3.46	28.84	12.83	0.00	0.00	1.44	1.44	0.00	1.33	1.33	3,441.71
Building 03/01/2011-09/30/2011	3.46	28.84	12.83	0.00	0.00	1.44	1.44	0.00	1.33	1.33	3,441.71
Building Off Road Diesel	3.46	28.84	12.83	0.00	0.00	1.44	1.44	0.00	1.33	1.33	3,441.71
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Time Slice 10/3/2011-10/31/2011 Active Days: 21	2.73	13.58	8.49	0.01	0.02	1.06	1.08	0.01	0.98	0.98	1,417.58
Asphalt 10/01/2011-10/31/2011	2.73	13.58	8.49	0.01	0.02	1.06	1.08	0.01	0.98	0.98	1,417.58
Paving Off-Gas	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.80	10.89	6.26	0.00	0.00	0.95	0.95	0.00	0.88	0.88	865.16
Paving On Road Diesel	0.21	2.62	1.01	0.00	0.01	0.11	0.12	0.00	0.10	0.10	396.96
Paving Worker Trips	0.04	0.07	1.22	0.00	0.01	0.00	0.01	0.00	0.00	0.01	155.46

Phase Assumptions

Phase: Demolition 5/1/2011 - 8/1/2011 - Default Demolition Description

Building Volume Total (cubic feet): 1200

Building Volume Daily (cubic feet): 1200

On Road Truck Travel (VMT): 20.83

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 6 hours per day

1 Crushing/Processing Equip (142 hp) operating at a 0.78 load factor for 6 hours per day

1 Generator Sets (549 hp) operating at a 0.74 load factor for 8 hours per day

3 Other Equipment (190 hp) operating at a 0.62 load factor for 3 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 4 hours per day

Phase: Mass Grading 9/1/2010 - 2/28/2011 - Default Mass Site Grading/Excavation Description

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0.05

Fugitive Dust Level of Detail: Default

12.22 lbs per acre-day

On Road Truck Travel (VMT): 154.07

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 7 hours per day

2 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 4 hours per day

2 Other Equipment (190 hp) operating at a 0.62 load factor for 3 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 4 hours per day

Phase: Paving 10/1/2011 - 10/31/2011 - Default Paving Description

Acres to be Paved: 5.74

Off-Road Equipment:

2 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Paving Equipment (104 hp) operating at a 0.53 load factor for 6 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

Phase: Building Construction 3/1/2011 - 9/30/2011 - Default Building Construction Description

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 7 hours per day

2 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 4 hours per day

2 Other Equipment (190 hp) operating at a 0.62 load factor for 3 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 6 hours per day

2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 4 hours per day

Phase: Building Construction 12/1/2010 - 8/1/2011 - Type Your Description Here

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 6 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name:

Project Name: IRWD OPA

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (tons/year unmitigated)	0.18	1.58	0.73	0.00	0.03	0.07	0.10	0.01	0.07	0.07	190.81
2011 TOTALS (tons/year unmitigated)	0.61	5.37	2.41	0.00	0.03	0.26	0.29	0.01	0.24	0.24	639.68

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

2010	0.18	1.58	0.73	0.00	0.03	0.07	0.10	0.01	0.07	0.07	190.81
Mass Grading 09/01/2010-02/28/2011	0.16	1.46	0.67	0.00	0.03	0.07	0.09	0.01	0.06	0.07	178.51
Mass Grading Dust	0.00	0.00	0.00	0.00	0.03	0.00	0.03	0.01	0.00	0.01	0.00
Mass Grading Off Road Diesel	0.14	1.24	0.50	0.00	0.00	0.06	0.06	0.00	0.05	0.05	138.83
Mass Grading On Road Diesel	0.02	0.21	0.08	0.00	0.00	0.01	0.01	0.00	0.01	0.01	28.73
Mass Grading Worker Trips	0.00	0.01	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.95
Building 12/01/2010-08/01/2011	0.02	0.12	0.06	0.00	0.00	0.01	0.01	0.00	0.01	0.01	12.31
Building Off Road Diesel	0.02	0.12	0.06	0.00	0.00	0.01	0.01	0.00	0.01	0.01	12.31
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2011	0.61	5.37	2.41	0.00	0.03	0.26	0.29	0.01	0.24	0.24	639.68
Building 12/01/2010-08/01/2011	0.10	0.76	0.39	0.00	0.00	0.04	0.04	0.00	0.04	0.04	80.79
Building Off Road Diesel	0.10	0.76	0.39	0.00	0.00	0.04	0.04	0.00	0.04	0.04	80.79
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading 09/01/2010-02/28/2011	0.07	0.62	0.30	0.00	0.01	0.03	0.04	0.00	0.03	0.03	83.17
Mass Grading Dust	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.06	0.53	0.22	0.00	0.00	0.02	0.02	0.00	0.02	0.02	64.68
Mass Grading On Road Diesel	0.01	0.09	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.39
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.10

Building 03/01/2011-09/30/2011	0.27	2.22	0.99	0.00	0.00	0.11	0.11	0.00	0.10	0.10	265.01
Building Off Road Diesel	0.27	2.22	0.99	0.00	0.00	0.11	0.11	0.00	0.10	0.10	265.01
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Demolition 05/01/2011-08/01/2011	0.15	1.62	0.65	0.00	0.02	0.06	0.08	0.00	0.06	0.06	195.83
Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Demo Off Road Diesel	0.15	1.60	0.57	0.00	0.00	0.06	0.06	0.00	0.06	0.06	184.71
Demo On Road Diesel	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.91
Demo Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.21
Asphalt 10/01/2011-10/31/2011	0.03	0.14	0.09	0.00	0.00	0.01	0.01	0.00	0.01	0.01	14.88
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.02	0.11	0.07	0.00	0.00	0.01	0.01	0.00	0.01	0.01	9.08
Paving On Road Diesel	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.17
Paving Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.63

Phase Assumptions

Phase: Demolition 5/1/2011 - 8/1/2011 - Default Demolition Description

Building Volume Total (cubic feet): 1200

Building Volume Daily (cubic feet): 1200

On Road Truck Travel (VMT): 20.83

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 6 hours per day

1 Crushing/Processing Equip (142 hp) operating at a 0.78 load factor for 6 hours per day

1 Generator Sets (549 hp) operating at a 0.74 load factor for 8 hours per day

3 Other Equipment (190 hp) operating at a 0.62 load factor for 3 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 4 hours per day

Phase: Mass Grading 9/1/2010 - 2/28/2011 - Default Mass Site Grading/Excavation Description

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0.05

Fugitive Dust Level of Detail: Default

12.22 lbs per acre-day

On Road Truck Travel (VMT): 154.07

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 7 hours per day

2 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 4 hours per day

2 Other Equipment (190 hp) operating at a 0.62 load factor for 3 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 4 hours per day

Phase: Paving 10/1/2011 - 10/31/2011 - Default Paving Description

Acres to be Paved: 5.74

Off-Road Equipment:

2 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Paving Equipment (104 hp) operating at a 0.53 load factor for 6 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

Phase: Building Construction 3/1/2011 - 9/30/2011 - Default Building Construction Description

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 7 hours per day

2 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 4 hours per day

2 Other Equipment (190 hp) operating at a 0.62 load factor for 3 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 6 hours per day

2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 4 hours per day

Phase: Building Construction 12/1/2010 - 8/1/2011 - Type Your Description Here

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 6 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Table 6. Total estimated GHG emissions from construction

	Input Emissions					
	Off Road Emissions			On road Emissions		
Year of Construction	**CO2 (metric tons/yr)**	**CH4 (metric tons/yr)**	**N2O (metric tons/yr)**	**CO2 (metric tons/yr)**	**Other (metric tons/yr)**	**CO2e (metric tons/yr)**
2010	137.1	0.0	0.0	36.0	1.9	176.3
2011	548.2	0.0	0.0	32.1	1.7	587.0
2012	-	-	-	-	-	-
2013	-	-	-	-	-	-
2014	-	-	-	-	-	-
2015	-	-	-	-	-	-
2016	-	-	-	-	-	-
2017	-	-	-	-	-	-
2018	-	-	-	-	-	-
2019	-	-	-	-	-	-
2020	-	-	-	-	-	-
2021	-	-	-	-	-	-
2022	-	-	-	-	-	-
2023	-	-	-	-	-	-
2024	-	-	-	-	-	-
2025	-	-	-	-	-	-
2026	-	-	-	-	-	-
2027	-	-	-	-	-	-
2028	-	-	-	-	-	-
2029	-	-	-	-	-	-
2030	-	-	-	-	-	-
Total Construction Emissions	**685.3**	**0.0**	**0.0**	**68.1**	**3.6**	**763.3**

Sources: URBEMIS 2007; CCAR 2008.

19.1

Diesel Fuel	**CO2**	**CH4**	**N2O**
kg CO2/gal diesel	10.15	0.00058	0.00026
g/gal diesel construction equip		0.58	0.26
ratio	1	5.71429E-05	2.56158E-05

Source: CH4 and N2O from Construction

tons/metric ton	Percent other G	GAS	CH4	N2O
0.90718474	5.00%	GWP	21	310

CH4 and N2O from Construction

Author: Brian Schuster
Date: August 11, 2008

Methodology:
Calculated ratio of CO2 emissions per gallon diesel fuel to CH4 and N2O to determine CH4 and N2O emissions from construction equipment
Used CCAR May 2008 Efs

Sources:
CCAR General Reporting Protocol May 2008 (pg. 93, 96)
CCAR General Reporting Protocol May 2008 (pg. 93, 96)
Assumptions:

Diesel Fuel	**CO2**	**CH4**	**N2O**		
kg CO2/gal diesel	10.15	0.00058	0.00026		
g/gal diesel construction equip		0.58	0.26		
ratio	1	5.71E-05	2.56158E-05	0.00006	0.00003

Gasoline	**CO2**	**CH4**	**N2O**
kg CO2/gal gasoline	8.81		
g/mi passenger (2005)		0.0147	0.0079
g/mi light truck (2005)		0.0157	0.0101
ratio	1	0	0

Appendix C

Biology Field Visit Memorandum

Memorandum

Date:	March 22, 2010
To:	Chris Kessler Irvine Ranch Water District 15600 Sand Canyon Avenue Irvine, CA 92618
From:	Danielle LeFer Biologist
Subject:	**Summary of Field Visit Conducted for OPA**

The above-referenced project site was reviewed for its potential to support special-status biological resources. A literature review was conducted for the entire project area, and a field visit was conducted for the Orange Park Acres (OPA) transmission main (near Rockhurst Drive), OPA reservoir, and OPA transmission main construction along roads. A previous biological report prepared by Harmsworth Associates in 2008 analyzed potential impacts from the aboveground emergency bypass pipeline, a portion of which is located within the El Modena Open Space and Preserve within the Orange County Natural Community Conservation Plan/Habitat Conservation Plan (NCCP/HCP) Central/Coastal Subregion, Central Subarea. This memorandum provides a summary of the field visit conducted for the OPA project and identifies potential constraints under the California Environmental Quality Act.

Literature Review

Prior to conducting field surveys, a California Natural Diversity Database (CNDDB) (CNDDB 2010) search was completed to detect special-status wildlife and plant species with the potential to occur within 5 miles of the project area. The species list resulting from the search is provided in **Attachment A**.

Based on information from CNDDB (2010), eight special-status plant species and 19 special-status wildlife species were initially evaluated for potential to occur within a 5-mile radius of the project site (**Table 1**). Habitats identified during field surveys, along with species distribution and habitat requirements, were used to determine which species could occur at the project site. As shown in **Table 1**, of the 27 species originally identified, 14 species were eliminated from further consideration because suitable habitat for these species was not present at the project site. The project site contains suitable habitat for the following eight special-status wildlife species and five special-status plant species, as discussed below.

Table 1. Special-Status Species with Potential to Occur within a 5-mile Radius of the Project Site, based on CNDDB Records

Species/Community	Status	Habitat Requirements	Likelihood of Occurrence
Wildlife			
Mexican long-tongued bat (*Choeronycterismexicana*)	SSC	Desert and montane riparian, desert scrub, desert succulent shrub, and pinyon-juniper habitats. In California, found mainly in San Diego County, in urban habitats. Roosts in caves, mines, and buildings.	None. No suitable habitat.
Pallid bat (*Antrozous pallidus*)	SSC	Habitat includes grasslands, shrublands, woodlands, and forests. Roosts in caves, crevices, mines, hollow trees, and buildings.	Low. Limited suitable roosting habitat (OPA reservoir).
Western mastiff bat (*Eumops perotis californicus*)	SSC	Open semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, chaparral. Roosts in crevices in cliff faces, buildings, trees, and tunnels.	Low to moderate (OPA reservoir).
Coastal cactus wren (*Campylorhynchus brunneicapillus sandiegenensis*)	SSC; NCCP	Arid portions of westward draining slopes.	High (temporary bypass line, OPA transmission main [near Rockhurst], OPA reservoir).
Coastal California gnatcatcher (*Polioptila californica californica*)	FE, SSC, NCCP	Obligate resident of arid coastal scrub.	High (Santiago Waterline, OPA Transmission Main [near Rockhurst Drive], OPA reservoir).
Least Bell's vireo (*Vireo bellii pusillus*)	FE, SE, NCCP	Riparian habitat (willows, dense valley foothill riparian habitat, lower portions of canyons).	None. No suitable habitat.
Long-eared owl (*Asio otus*)	SSC	Riparian, conifer, oak, and desert woodlands adjacent to grassland, meadows, or shrubs.	None. No suitable habitat.
Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*)	None; NCCP	Sparse, mixed chaparral and coastal scrub, especially coastal sage scrub.	Low to moderate (temporary bypass line, OPA transmission main [near Rockhurst Drive], OPA reservoir).

Species/Community	Status	Habitat Requirements	Likelihood of Occurrence
Coast patch-nosed snake (*Salvadora hexalepis virgultea*)	SSC	Shrubby, brushy vegetation.	Low to moderate (temporary bypass line, OPA transmission main [near Rockhurst Drive], OPA reservoir).
Coast horned lizard (*Phrynosoma blainvillii*)	SSC, NCCP	Valley-foothill hardwood, conifer, riparian, and grassland habitats.	None. No suitable habitat.
Northern red-diamond rattlesnake (*Crotalus ruber ruber*)	SSC; NCCP	Chaparral, woodland, and arid desert habitats in dense vegetation and rocky areas.	Low to moderate (temporary bypass line, OPA transmission main [near Rockhurst Drive], OPA reservoir).
Orangethroat whiptail (*Aspidoscelis hyperythra*)	SSC	Coastal scrub, chamise-redshank chaparral, mixed chaparral, and valley-foothill hardwood habitat.	Moderate (temporary bypass line, OPA transmission main [near Rockhurst Drive], OPA reservoir).
Rosy boa (*Charina trivirgataI)*	NCCP	Desert and chaparral habitats in southern California; in coastal areas, found in rocky chaparral-covered hillsides and canyons; in deserts, found on scrub flats with cover and in the mountains.	None. No suitable habitat.
Two-striped garter snake (*Thamnophis hammondii*)	SSC	Aquatic. Associated with permanent or semi-permanent bodies of water.	None. No suitable habitat.
Coast Range newt (*Taricha torosa torosa*)	SSC	Coastal drainages; lives in terrestrial habitats, migrating over 1 km to breeding sites (ponds, reservoirs, slow-moving streams).	None. No suitable habitat.
Northern leopard frog (*Lithbates pipiens*)	SSC	Uncommon and localized in California; highly aquatic, occurring in or near quiet permanent and semi-permanent water in various habitats.	None. No suitable habitat.
Western spadefoot (*Spea hammondii*)	SSC; NCCP	Primarily grasslands; occasionally valley-foothill hardwood woodlands.	None. No suitable habitat.
Santa Ana sucker (*Catostomus santaanae*)	FT; SSC	Endemic to Los Angeles Basin South Coastal streams.	None. No suitable habitat.

Species/Community	Status	Habitat Requirements	Likelihood of Occurrence
San Diego fairy shrimp (*Branchinecta sandiegonensis*)	FE; NCCP	Vernal pools in San Diego and Orange Counties.	None. No suitable habitat.
Plants			
Allen's pentachaeta (*Pentachaeta aurea* ssp. *allenii*)	1B.1	In openings in valley and foothill grasslands and coastal scrub.	Moderate to high (temporary bypass line, OPA transmission main [near Rockhurst Drive]).
Chaparral sand-verbena (*Abronia villosa* var. *aurita*)	1B.1	Chaparral, coastal scrub.	Low to moderate; typically associated with sandy soil (temporary bypass line, OPA transmission main [near Rockhurst Drive]).
Intermediate mariposa lily (*Calochortus weedii var. intermedius*)	1B.2; NCCP	Coastal scrub, chaparral, valley and foothill grassland, woodland, lower montane coniferous forest; occurs on rocky and sandy sites, usually of granitic or alluvial material.	Moderate to high (temporary bypass line, OPA transmission main [near Rockhurst Drive]).
Many-stemmed dudleya (*Dudleya multicaulis*)	1B.2	Chaparral, coastal scrub, valley and foothill grassland; in heavy, often clayey soils or grassy slopes.	Low to moderate because of absence of clay soils (temporary bypass line, OPA transmission main [near Rockhurst Drive]).
Peninsular nolina (*Nolina cismontana*)	1B.2	Chaparral, coastal scrub.	Moderate to high (temporary bypass line, OPA transmission main [near Rockhurst Drive]).
San Fernando Valley spineflower (*Chorizanthe parryi* var. *Fernandina*)	Federal Candidate; SE; 1B.1	Coastal scrub, sandy soils.	None. Probably extirpated.
Santa Ana River woollystar (*Eriastrum densifolium* ssp.	FE; SE; 1B.1	Coastal scrub, chaparral; in sandy soils on river floodplains or terrassed fluvial	None. No alluvial fans or streambeds.

Species/Community	Status	Habitat Requirements	Likelihood of Occurrence
sanctorum)		deposits.	
Southern tarplant (*Centromadia parryi* ssp. *australis*)	1B.1	Margins of marshes and swamps; valley and foothill grassland.	None. No suitable habitat.

Species/Community	Status	Habitat Requirements	Likelihood of Occurrence
Federal FE = Endangered FT = Threatened SC = Federal Species of Concern **State** SE = Endangered ST = Threatened SR = Rare SSC = State Species of Concern **California Native Plant Society (CNPS) Categories** 1A = List 1A species: plants presumed extinct in California. 1B = List 1B species: rare, threatened, or endangered in California and elsewhere. 2 = List 2 species: rare, threatened, or endangered in California but more common elsewhere. 3 = List 3 species: plants for which we need more information – Review List. 4 = List 4 species: plants of limited distribution – Watch List. **California Native Plant Society Threat Code extensions** .1 = Seriously threatened in California (over 80% of occurrences threatened; high degree and immediacy of threat). .2 = Fairly threatened in California (20%– 80% of occurrences threatened; moderate degree and immediacy of threat). .3 = Not very threatened in California (less than 20% of occurrences threatened or no current threats known). Source: California Department of Fish and Game 2010.			

Special-Status Species outside of the NCCP

The following special-status species have a low to high likelihood of occurring at the project site:

- California gnatcatcher,
- Coastal cactus wren,
- Southern California rufous-crowned sparrow,
- Northern red-diamond rattlesnake,
- Coast patch-nosed snake,
- Orangethroat whiptail,
- Western mastiff bat,
- Pallid bat,

- Intermediate mariposa lily,
- Allen's pentachaeta,
- Chaparral sand-verbena,
- Many-stemmed dudleya, and
- Peninsula nolina.

Field Visit

A field visit was conducted by Danielle LeFer and Erika Eidson on March 15, 2010. The weather conditions were sunny, with 10% cloud cover and no wind. The entire project footprint was surveyed on foot to assess plant communities and potentially suitable habitat for special-status species. Plant and wildlife species observed during the field visit are provided in **Table 2** and **Table 3**, respectively.

Plant communities were mapped according to definitions provided in Holland (1986). There are three areas within the study area that support natural communities. The following plant communities are depicted in **Figure 1**: non-native grassland, coastal sage scrub, cactus scrub, and ornamental vegetation.

Based on the literature review and site visit, it was determined that vegetation in the vicinity of the temporary bypass line and OPA transmission main (near Rockhurst Drive) have the potential to support the following species: California gnatcatcher, coastal cactus wren, southern California rufous-crowned sparrow, northern red-diamond rattlesnake, coast patch-nosed snake, orangethroat whiptail, western mastiff bat, pallid bat, Plummer's mariposa lily, Allen's pentachaeta, chaparral sand-verbena, many-stemmed dudleya, and peninsula nolina.

The area surrounding the OPA reservoir and the roadways has the potential to support western mastiff bat, pallid bat, and migratory nesting birds.

References

California Department of Fish and Game. 2010. *Life History Accounts and Range Maps, California Wildlife Habitat Relationships System.* Available: <http://www.dfg.ca.gov/biogeodata/cwhr/cawildlife.aspx>. Accessed: March 10, 2010.

California Natural Diversity Database. 2010. RareFind 3, Version 3.1.0 (February 28, 2010). California Department of Fish and Game, Sacramento, CA.

Harmsworth Associates. 2008. *Santiago Waterline Restoration Plan*. Prepared for Irvine Ranch Water District, Irvine, CA. December, 13 pp.

Holland, R. F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*. Nongame-Heritage Program, California Department of Fish and Game, Sacramento, CA.

Table 2. OPA Vascular Plant Species List

Scientific Name	Common Name	Special Status
CONIFEROPHYTA - CONIFERS		
Pinaceae - Pine Family		
Pinus attenuata	Knobcone Pine	
ANTHOPHYTA - ANGIOSPERMS: DICOT		
Anacardiaceae - Sumac Family		
Malosma laurina	Laurel Sumac	
Rhus integrifolia	Lemonadeberry	
**Schinus molle*	Peruvian Pepper-tree	
Apocynaceae - Dogbane Family		
**Nerium oleander*	Oleander	
**Vinca major*	Greater Periwinkle	
Araliaceae - Ginseng Family		
**Hedera helix*	English Ivy	
Asteraceae - Sunflower Family		
Artemisia californica	California Sagebrush	
Baccharis salicifolia	Mule Fat	
Baccharis sarothroides	Broom Baccharis	
**Centaurea melitensis*	Tocalote	
**Cirsium vulgare*	Bull Thistle	
Encelia californica	California Bush Sunflower	
**Picris echioides*	Bristly Ox-tongue	
**Silybum marianum*	Blessed Milk Thistle	
Betulaceae - Birch Family		
Alnus rhombifolia	White Alder	
Brassicaceae - Mustard Family		
**Brassica nigra*	Black Mustard	
**Hirschfeldia incana*	Short-pod Mustard	
Cactaceae - Cactus Family		
Opuntia littoralis	Coastal Prickly-pear	
Caprifoliaceae - Honeysuckle Family		
**Lonicera japonica*	Japanese Honeysuckle	
Sambucus mexicana	Blue Elderberry	

Scientific Name	Common Name	Special Status
Chenopodiaceae - Goosefoot Family		
**Chenopodium murale*	Nettle-leaved Goosefoot	
**Salsola tragus*	Prickly Russian-thistle	
Cistaceae - Rock-rose Family		
**Cistus creticus*	Pink Rockrose	
Crassulaceae - Stonecrop Family		
Crassula connata	Sandy Pygmy-weed	
Cucurbitaceae - Gourd Family		
Marah macrocarpus	Wild Cucumber	
Euphorbiaceae - Spurge Family		
**Ricinus communis*	Castor-bean	
Fabaceae - Pea Family		
**Acacia redolens*	Prostrate Acacia	
Lotus scoparius	Common Deerweed	
Lupinus bicolor	Miniature Lupine	
**Medicago polymorpha*	Toothed Medick	
Fagaceae - Beech Family		
Quercus agrifolia	Coast Live Oak	
Quercus berberidifolia	Interior Scrub Oak	
Geraniaceae - Geranium Family		
**Erodium cicutarium*	Red-stemmed Filaree	
**Erodium moschatum*	White-stemmed Filaree	
**Geranium dissectum*	Cut-leaved Geranium	
Hamamelidaceae - Witch-Hazel Family		
Myriophyllum sibiricum	American Milfoil	
Lamiaceae - Mint Family		
**Marrubium vulgare*	White Horehound	
Salvia apiana	White Sage	
Salvia mellifera	Black Sage	
Myrtaceae - Myrtle Family		
**Eucalyptus camaldulensis*	River Red Gum	
Nyctaginaceae - Four-o'clock Family		
Boerhavia coccinea	Scarlet Spiderling	
Oxalidaceae - Wood-sorrel Family		
**Oxalis pes-caprae*	Bermuda-buttercup	
Plantaginaceae - Plantain Family		
**Plantago lanceolata*	English Plantain	
Platanaceae - Sycamore Family		
Platanus racemosa	California Sycamore	
Polygonaceae - Buckwheat Family		

Scientific Name	Common Name	Special Status
Eriogonum fasciculatum	California Buckwheat	
Primulaceae - Primrose Family		
**Anagallis arvensis*	Scarlet Pimpernel	
Rosaceae - Rose Family		
Heteromeles arbutifolia	Toyon	
Solanaceae - Nightshade Family		
Datura wrightii	Perennial Jimsonweed	
**Nicotiana glauca*	Tree Tobacco	
Urticaceae - Nettle Family		
**Urtica urens*	Dwarf Nettle	
ANTHOPHYTA - ANGIOSPERMS: MONOCOT		
Poaceae - Grass Family		
**Avena fatua*	Wild Oat	
**Bromus arenarius*	Australian Brome	
**Bromus diandrus*	Ripgut Brome	
**Bromus madritensis*	Foxtail Chess	
**Cynodon dactylon*	Bermuda Grass	
**Lolium multiflorum*	Italian Ryegrass	
**Pennisetum setaceum*	Fountain Grass	

Legend

*=Non-native species

Special Status:

Federal
FE - listed as endangered under the federal Endangered Species Act.
FT - listed as threatened under the federal Endangered Species Act.

State
SE - listed as endangered under the California Endangered Species Act.
ST – listed as threatened under California Endangered Species Act.
SR – listed as rare under California Native Plant Protection Act.

CNPS List – California Native Plant Society
1B – Rare, threatened or endangered in California and elsewhere
2 – Rare, threatened or endangered in California but more common elsewhere
3 – May be rare but more research needed to determine true status
4 – Limited distribution and are uncommon but not presently rare or endangered

Table 3. OPA Wildlife Species

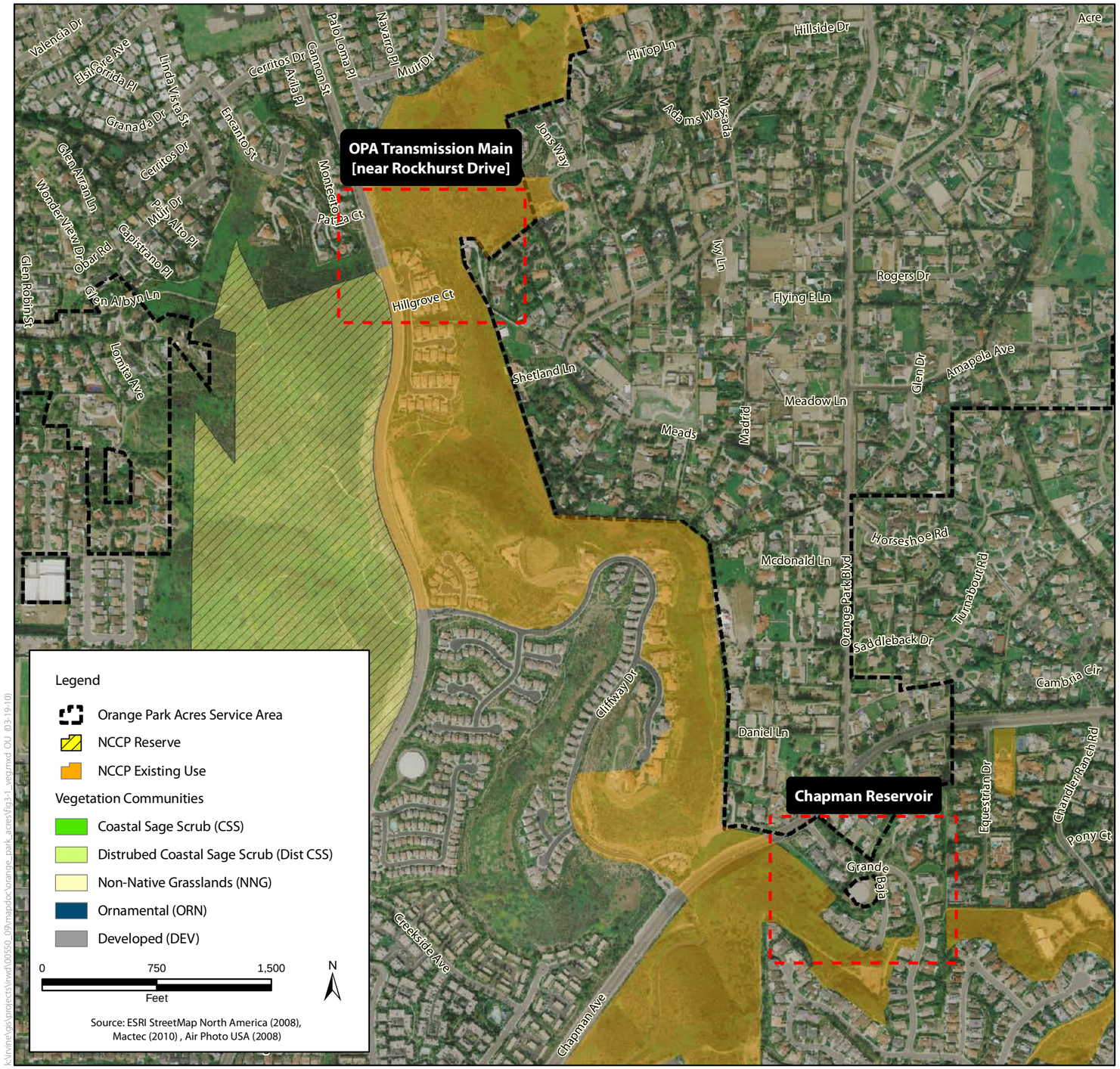
Location	Species
OPA reservoir	
	Yellow-rumped warbler (*Dendroica coronata*)
	Mourning dove (*Zenaida macroura*)
	Allen's hummingbird (*Selasphorus sasin*)
	House finch (*Carpodacus mexicanus*)
	Black phoebe (*Sayornis nigricans*)
	California towhee (*Pipilo crissalis*)
	American goldfinch (*Spinus tristis*)
OPA transmission main (near Rockhurst Drive)	
	California towhee (*Pipilo crissalis*)
	Bewick's wren (*Thryomanes bewickii*)
	Yellow-rumped warbler (*Dendroica coronata*)
	Anna's hummingbird (*Calypte anna*)
	House finch (*Carpodacus mexicanus*)
	White-crowned sparrow (*Zonotrichia leucophry*)
	Common raven (*Corvus corax*)
	California quail (*Callipepla californica*)

Attachment A

Attachment A. CNDDB search results for 5-mile radius surrounding Proposed OPA Transmission Main Project

Abronia villosa var. aurita	Chaparral sand-verbena
Aimophila ruficeps canescens	Southern California rufous-crowned sparrow
Antrozous pallidus	Pallid bat
Asio otus	Long-eared owl
Aspidoscelis hyperythra	Orangethroat whiptail
Aspidoscelis tigris stejnegeri	Coastal whiptail
Branchinecta sandiegonensis	San Diego fairy shrimp
Calochortus weedii var. intermedius	Intermediate mariposa-lily
Campylorhynchus brunneicapillus sandiegensis	Coastal cactus wren
Catostomus santaanae	Santa Ana sucker
Centromadia parryi ssp. australis	Southern tarplant
Charina trivirgata	Rosy boa
Choeronycteris mexicana	Mexican long-tongued bat
Chorizanthe parryi var. fernandina	San Fernando Valley spineflower
Crotalus ruber ruber	Northern red-diamond rattlesnake
Dudleya multicaulis	Many-stemmed dudleya
Elanus leucurus	White-tailed kite
Eriastrum densifolium ssp. sanctorum	Santa Ana River woollystar
Eumops perotis californicus	Western mastiff bat
Lithobates pipiens	Northern leopard frog
Myotis yumanensis	Yuma myotis
Nolina cismontana	Peninsular nolina
Pentachaeta aurea ssp. allenii	Allen's pentachaeta
Phrynosoma blainvillii	Coast horned lizard
Polioptila californica californica	Coastal California gnatcatcher
Salvadora hexalepis virgultea	Coast patch-nosed snake
Spea hammondii	western spadefoot
Taricha torosa torosa	Coast Range newt
Thamnophis hammondii	Two-striped garter snake
Vireo bellii pusillus	Least Bell's vireo

Figure 1



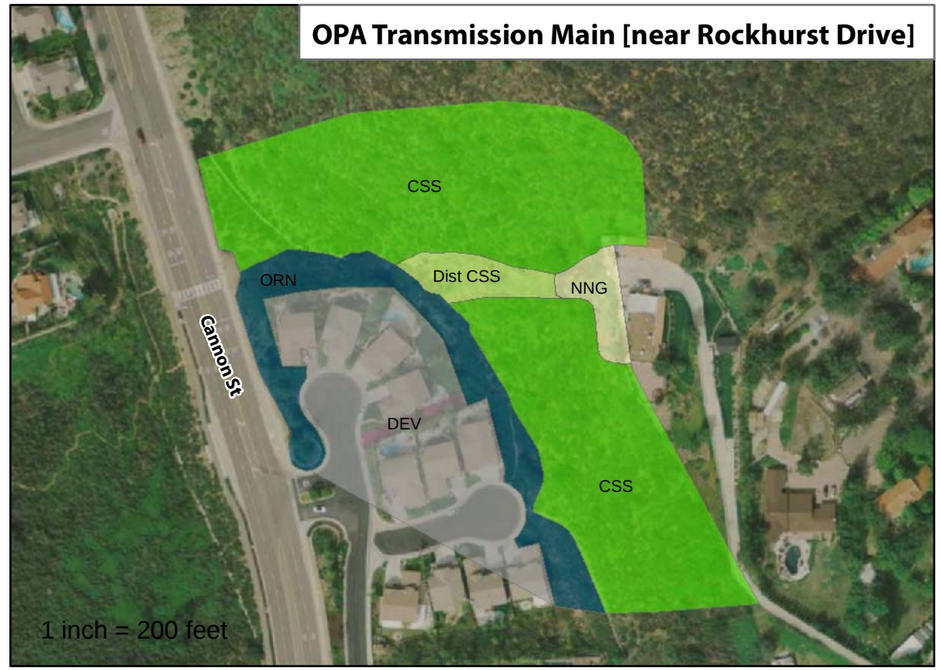


Figure 1
OPA Vegetation Communities
Orange Park Acres - Water Improvement Project

Appendix D

Cultural Resources Records Search Results

Cultural Resources Records Search Results

Project: IRWD-Orange
Project #: 00550.09
Date: 2/22/2010
Info Center: SCCIC-Fullerton

Quad Maps: *Orange*, 1964, Revised 1981
Township and Range: 4 South, 9 West
Search Radius: ½-mile

Resources:

Cultural resources within the proposed project area:

CA-ORA-774
CA-ORA-702
CA-ORA-179872

The site forms for these resources were copied for reference.

Cultural resources within a one-half mile radius of the proposed project area:

CA-LAN-89
CA-LAN-369
CA-LAN-546
CA-LAN-556
CA-LAN-643
CA-LAN-644
CA-LAN-1017
CA-LAN-1018
CA-LAN-1019
CA-LAN-1020
CA-LAN-1172
CA-LAN-1548

The site forms for these resources were copied for reference.

Reports:

Reports within the propose project area or within a one-half mile radius of the proposed project area:

OR-323*
OR-1050*
OR-871
OR-214
OR-3084
OR-469
OR-752
OR-162
OR-163
OR-178
OR-550
OR-1792
OR-3340
OR-2710
OR-3699
OR-174
OR-494
OR-2256
OR-2380

*These reports covered portions of the project area and were photocopied for reference, although, neither one seemed to have too much useful current information in it.

National Register of Historic Places properties within one-quarter mile of the proposed project area: None

California Register properties within one-quarter mile of the proposed project area: None

California Historic Landmarks within one-quarter mile of the proposed project area: None

California Points of Historic Interest within one-quarter mile of the proposed project area: None

Appendix E

Comments Received and Responses to Comments

Comments Received and Responses to Comments

Introduction

The Irvine Ranch Water District has evaluated the comments received on the Orange Park Acres Draft Initial Study/Mitigated Negative Declaration (IS/MND). This document contains copies of the comments received during the public review process and provides written responses for each of the comments. In accordance with Section 15074 of the State CEQA Guidelines, the lead agency will consider the IS/MND together with any comments received during the public review process. While written responses are not required for an IS/MND, the Irvine Ranch Water District has elected to provide written responses to all comments received during the public review process for the record.

Comments Received

Prior to the close of the public review period for the project, the Irvine Ranch Water District received two comment letters. The commenting parties are listed below. Each of the commenting parties is labeled with a letter, which corresponds to the comment letters and the responses to comments provided herein.

Comment #	Agency/Organization/Individual	Date Received
A	Department of Transportation, District 12	7/2/2010
B	City of Orange	7/13/2010

A. Chris Herre, Department of Transportation, District 12.

DEPARTMENT OF TRANSPORTATION
District 12
3337 Michelson Drive, Suite 380
Irvine, CA 92612-8894
Tel: (949) 724-2267
Fax: (949) 724-2592

Flex your power!
Be energy efficient!

June 29, 2010

Mr. Christian Kessler
Irvine Ranch Water District
15600 Sand Canyon Avenue
Irvine, CA 92618-3102

File: IGR/CEQA
SCH#: 2010061039
Log #: 2548
SR-55 and SR-241

Subject: Orange Park Acres Domestic Water Distribution and Transmission System Improvements

Dear Mr. Kessler,

Thank you for the opportunity to review and comment on the **Mitigated Negative Declaration for the Orange Park Acres Domestic Water Distribution and Transmission System Improvements** Project. The project proposes a series of water distribution and transmission infrastructure improvements throughout the Orange Park Acres service area. The nearest State route to the project site is SR-55 and SR-241.

The California Department of Transportation (Department), District 12 is a commenting agency on this project and we have no comment at this time. However, in the event of any activity within the Department's right-of-way, an encroachment permit will be required. A-1

Please continue to keep us informed of this project and any future developments, which could potentially impact State transportation facilities. If you have any questions or need to contact us, please do not hesitate to call Damon Davis at (949) 440-3487.

Sincerely,

Chris Herre, Branch Chief
Local Development/Intergovernmental Review

C: Terry Roberts, Office of Planning and Research

Response to Comment A-1

Thank you for your comment. The proposed project would occur outside of Caltrans right-of-way; however, if any changes are made to the proposed project that require encroachment upon Caltrans facilities or right-of-way, Irvine Ranch Water District will notify the Department of Transportation of such changes.

B. Alice Angus, City of Orange Department of Community Development.

CITY OF ORANGE

DEPARTMENT OF COMMUNITY DEVELOPMENT www.cityoforange.org

ADMINISTRATION	PLANNING DIVISION	BUILDING DIVISION	CODE ENFORCEMENT DIVISION
(714) 744-7240	(714) 744-7220	(714) 744-7200	(714) 744-7244
fax: (714) 744-7222	fax: (714) 744-7222	fax: (714) 744-7245	fax: (714) 744-7245

July 13, 2010 #25-10

Attn: Christian Kessler via email: kessler@irwd.com
Irvine Ranch Water District
15600 Sand Canyon Avenue
Irvine, CA. 92618

Subject: Mitigated Negative Declaration (MND) for the Irvine Ranch Water District's (IRWD) Orange Park Acres Domestic Water Distribution and Transmission System Improvement Project

Dear Mr. Kessler,

The City of Orange (City) has received the MND (dated June 2010) for the Orange Park Acres Water Distribution and Transmission System Improvement Project. The project involves upgrading the Orange Park Acres (OPA) transmission main to a 20" line connecting to the existing Zone 5 16-inch line at Jamboree and Chapman, upgrading distribution lines, removing an emergency bypass line, installing pressure reducing stations, telemetry, and bidirectional meters, modifying the East Orange County Water District (EOCWD) turnout, upgrading the Meads pump station, and demolishing the Orange Park Acres (OPA) reservoir, and four booster pump stations.

Improvements proposed within Orange jurisdiction include below ground pipelines and appurtenances proposed within City street right of way and an aboveground temporary pressure reducing station on Chapman Avenue between Orange Park Boulevard and Jamboree Road. Project improvements outside of City street right of way include installation of Pressure Reducing Valves (PRV-1 and PRV-2) with telemetry, relocating the EOCWD turnout, OPA reservoir demolition, removal of the emergency bypass line near the El Modena Open Space area, and data collection site improvements at two City reservoirs.

The City previously provided comments on a preliminary draft of the MND to IRWD in May 2010. IRWD has addressed the majority of our comments, and as such our comments are limited to the following:

1. Page 2-19 identifies City of Orange Tank No. 10 as the data collection site with another City reservoir (unnamed) identified as an alternate site. Note that Figure 2-8 appears to be B-1

pointing to City Reservoir No. 8 (addressed 7115 East La Cumbre Drive) as the proposed data collection site while City of Orange Tank No. 10 (addressed 2525 North Cannon Street) is identified as the alternate site. Please correct as needed. Also note that it is the City's understanding that the data collection site is proposed at City Reservoir No. 10A addressed 2586 East Skytop Court (not City Reservoir No. 10 as labeled). Please correct as needed. B-1 Cont.

2. As noted in the MND, installation of improvements within City street right of way will require a City encroachment permit. The City acknowledges that IRWD has submitted an encroachment permit application and preliminary design plans, and are being reviewed by City staff. Note that the project's final design plans must comply with all City standards prior to City issuance of an encroachment permit.

   In addition, please note that City transportation and/or haul permits are required if the project involves dirt hauling or oversized vehicles on City streets. For the demolition of the reservoir site and any Booster Pump Stations located within Orange, a demolition permit is required and a grading permit may be required if the project involves moving 50 cubic yards of dirt, or changes onsite drainage compared to existing conditions. Finally, Site Plan Review approvals will be needed for aboveground installations outside of City street right of way. B-2

3. Page 3-42 Water Quality- The City of Orange Initial Study checklist contains additional water quality questions (beyond the checklist questions contained in the CEQA Guidelines (Appendix G), as required by the County's Drainage Area Management Plan). The City requests the Initial Study/MND incorporate and address these checklist questions so that the City is able to use the MND for CEQA compliance purposes when it issues permits and/or takes any discretionary actions related to the project. The checklist is available on the City's website at www.cityoforange.org under the City Departments >> Community Development >> Plans and Documents tab(s). B-3

Thank you for your consideration of our comments and we look forward to coordinating with IRWD in the coming weeks regarding final design details and permitting for this project. If you have any questions regarding this letter, please contact Jennifer Le, Senior Planner, at jle@cityoforange.org or at (714) 744 7238.

Sincerely,

Alice Angus
Community Development Director

cc: Joe DeFrancesco, Public Works Director
Frank Sun, City Engineer
Amir Farahani, City Traffic Engineer
Michael Wolfe, Acting Water Division Manager
George Liang, Principal Civil Engineer

Response to Comment B-1

Thank you for your comment. Page 2-19 and Figure 2-8 have been revised in this Final IS/MND to reflect the corrections identified as part of this comment.

Response to Comment B-2

Thank you for your comment. The discussion on page 2-21, Proposed Permits, and on page 2-24, Discretionary Actions and Approvals, has been revised to accurately reflect the City's requirements for transportation permits, haul permits, demolition permits, grading permits, and site plan approvals.

Response to Comment B-3

Thank you for your comment. The additional water quality checklist questions have been incorporated into this Final IS/MND on pages 3-40 through 3-45 as requested.