DRAFT

INITIAL STUDY/
MITIGATED NEGATIVE DECLARATION

SAN ANTONIO WATER COMPANY HEADQUARTERS PROJECT

UPLAND, CALIFORNIA

LSA

August 2025

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SAN ANTONIO WATER COMPANY HEADQUARTERS PROJECT

UPLAND, CALIFORNIA

Submitted to:

The City of Upland
460 N. Euclid Avenue
Upland, California 91786
Contact: Joshua Winter, Senior Planner

Prepared by:

LSA
3210 El Camino Real, Suite 100
Irvine, California 92602
(949) 553-0666

Project No. 20241723

LSA

August 2025

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TABLE OF CONTENTS

TABLE OF CONTENTS i
FIGURES AND TABLES ii
LIST OF ABBREVIATIONS AND ACRONYMS iii
1.0 PROJECT INFORMATION 1-1
2.0 PROJECT DESCRIPTION 2-1
2.1 Project Site 2-1
2.2 Proposed Project 2-7
2.3 Project Approvals 2-13
3.0 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED 3-1
3.1 Determination 3-1
4.0 CEQA ENVIRONMENTAL CHECKLIST 4-1
4.1 Aesthetics 4-1
4.2 Agriculture and Forestry Resources 4-5
4.3 Air Quality 4-7
4.4 Biological Resources 4-16
4.5 Cultural Resources 4-21
4.6 Energy 4-25
4.7 Geology and Soils 4-28
4.8 Greenhouse Gas Emissions 4-33
4.9 Hazards and Hazardous Materials 4-38
4.10 Hydrology and Water Quality 4-43
4.11 Land Use and Planning 4-52
4.12 Mineral Resources 4-54
4.13 Noise 4-56
4.14 Population and Housing 4-63
4.15 Public Services 4-65
4.16 Recreation 4-68
4.17 Transportation 4-69
4.18 Tribal Cultural Resources 4-73
4.19 Utilities and Service Systems 4-79
4.20 Wildfire 4-83
4.21 Mandatory Findings of Significance 4-86
5.0 LIST OF PREPARERS 5-1
6.0 REFERENCES 6-1

FIGURES AND TABLES

FIGURES

Figure 2-1: Project Location 2-3
Figure 2-2: Aerial Photograph and Surrounding Land Uses 2-5
Figure 2-3: Conceptual Site Plan 2-9

TABLES

Table 1.A: Potential Permits and Approvals 1-2
Table 2.A: Potential Permits and Approvals 2-13
Table 4.3.A: Short-Term Regional Construction Emissions 4-10
Table 4.3.B: Project Operational Emissions 4-11
Table 4.3.C: Project Localized Construction and Operational Emissions 4-13
Table 4.6.A: Estimated Annual Energy Use of Project 4-26
Table 4.8.A: Greenhouse Gas Emissions 4-34
Table 4.13.A: Existing Noise Level Measurements 4-57
Table 4.13.B: Potential Construction Noise Impacts at Nearest Receptor 4-58
Table 4.13.C: City of Upland Exterior Noise Compatibility Standards 4-59
Table 4.13.D: Daytime Exterior Noise Level Impacts 4-60
Table 4.13.E: Nighttime Exterior Noise Level Impacts 4-61
Table 4.13.F: Criteria for Potential Vibration Annoyance 4-61

APPENDICES

A: AIR QUALITY AND GREENHOUSE GAS TECHNICAL MEMORANDUM
B: BIOLOGICAL RESOURCES ASSESSMENT
C: CULTURAL RESOURCES ASSESSMENT
D: REPORT OF GEOTECHNICAL EVALUATIONS
E: PRELIMINARY WATER QUALITY MANAGEMENT PLAN
F: NOISE AND VIBRATION IMPACT ANALYSIS
G: TRAFFIC IMPACT ANALYSIS

LIST OF ABBREVIATIONS AND ACRONYMS

AAQS	ambient air quality standards
AB	Assembly Bill
ADA	Americans with Disabilities Act
amsl	above meal sea level
APN	Assessor's Parcel Number
APSA	Aboveground Petroleum Storage Act
AQMP	Air Quality Management Plan
Basin	South Coast Air Basin
Basin Plan	Water Quality Control Plan
BMPs	Best Management Practices
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
Cal/OSHA	California Occupational Safety and Health Administration
CalARP	California Accidental Release Prevention
CalEEMod	California Emissions Estimator Model
Cal/EPA	California Environmental Protection Agency
CALGreen Code	California Green Building Standards Code
CalRecycle	California Department of Resources Recycling and Recovery
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CBC	California Building Code
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CERS	California Environmental Reporting System
CGP	Construction General Permit
CGS	California Geologic Survey
CH_4	methane

City	City of Upland
CMP	Congestion Management Plan
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
County	County of San Bernardino
CRPR	California Rare Plant Ranks
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
dBA	A-weighted decibel
DIR	California Department of Industrial Relations
DOC	California Department of Conservation
DOSH	Division of Occupational Safety and Health
DTSC	California Department of Toxic Substances Control
DWR	California Department of Water Resources
EMFAC	California Emissions Factor Model
FAR	Floor-area ratio
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FTA	Federal Transit Administration
GHG	greenhouse gas
GSAs	Groundwater Sustainability Agencies
GSPs	Groundwater Sustainability Plans
GWh	gigawatt-hours
HASP	Health and Safety Plan
HMBP	Hazardous Materials Business Plan
HVAC	heating, ventilation, and air conditioning
IEUA	Inland Empire Utilities Agency

in/sec	inches per second
IS/MND	Initial Study/Mitigated Negative Declaration
ITE	Institute of Transportation Engineers
kWh	kilowatt-hours
lbs/day	pounds per day
LEED	Leadership in Energy and Environmental Design
L_{eq}	equivalent continuous sound level
LID	Low Impact Development
LOS	Level of Service
LSA	LSA Associates, Inc.
LST	Local Significance Threshold
L_w	sound power level
MBTA	Migratory Bird Treaty Act
mgd	million gallons per day
MLD	Most Likely Descendant
MM	Mitigation Measure
mpg	miles per gallon
MRZ	Mineral Resource Zone
MWD	Metropolitan Water District of Southern California
MT CO_2e	metric tons of carbon dioxide equivalent
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NO	nitric oxide
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
O_3	ozone (or smog)
OSHA	United States Department of Labor, Occupational Safety and Health Administration
PB/I	Public/Institutional
PCEs	Passenger Car Equivalent

$PM_{2.5}$	particulate matter less than 2.5 microns in size
PM_{10}	particulate matter less than 10 microns in size
ppb	parts per billion
ppm	parts per million
PPV	peak particle velocity
PRC	Public Resources Code
Project	San Antonio Water Company (SAWCo) Headquarters Project
PU	Public Utilities
RCRA	Resource Conservation and Recovery Act
RMP	Risk Management Plan
RP-1	IEUA Regional Water Reclamation Facility 1
RS-10	Single-Family Residential RS-10,000
RTP/SCS	Regional Transportation Plan/Sustainable Communities Strategy
RWQCB	Regional Water Quality Control Board
SARWQCB	Santa Ana Regional Water Quality Control Board
SAWCo	San Antonio Water Company
SB	Senate Bill
SBCFPD	San Bernardino County Fire Protection District
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SDSs	Safety Data Sheets
SFR-L	Single-Family Residential Low
SGMA	Sustainable Groundwater Management Act
SMARA	Surface Mining and Reclamation Act
SO_2	sulfur dioxide
SO_X	sulfur oxides
SR-210	State Route 210
SRA	State Responsibility Area
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TIA	Traffic Impact Analysis

TIA Guidelines	Traffic Impact Analysis Guidelines
TMDL	Total Maximum Daily Load
TPA	Transit Priority Area
UPD	Upland Police Department
USACE	United States Army Corps of Engineers
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UST	Underground Storage Tank
UUSD	Upland Unified School District
UWMP	Urban Water Management Plan
VdB	vibration velocity decibels
VMT	vehicle miles traveled
VHFHSZ	Very High Fire Hazard Severity Zone
VOCs	volatile organic compounds
WECWD	West End Consolidated Water Company
WQMP	Water Quality Management Plan
ZEV	zero-emission vehicle

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1.0 PROJECT INFORMATION

1. **Project Title:**

   San Antonio Water Company Headquarters Project

2. **Lead Agency Name and Address:**

   City of Upland
   460 North Euclid Avenue
   Upland, CA 91786

3. **Contact Person and Phone Number:**

   Joshua Winter, Senior Planner
   (909) 931-4143
   jwinter@uplandca.gov

4. **Project Location:**

   400 East 20th Street
   Upland, CA 91784

5. **Project Sponsor's Name and Address:**

   Brian Lee, General Manager/CEO
   San Antonio Water Company
   139 North Euclid Avenue
   Upland, CA 91786
   (909) 982-4107

6. **General Plan Designation:**

   Existing: Single-Family Residential Low (SFR-L)
   Proposed: Public Utilities (PU)

7. **Zoning:**

   Existing: Single-Family Residential RS-10,000 (RS-10)
   Proposed: Public/Institutional (PB/I)

8. **Description of Project:**

   The Project would result in the construction of a new 3,698-square-foot San Antonio Water Company headquarters and associated improvements including a 4,066-square-foot maintenance building, maintenance yard, driveway, parking, solar cover, landscaping, and utility improvements.

9. **Surrounding Land Uses and Setting:**

   The Project site is generally surrounded by a mix of residential, commercial, and industrial uses. To the north, the Project site is bound by East 20th Street, across which are single-family

residential uses. The Project site is immediately bound to the east by undeveloped open space owned by Southern California Edison Company. Further east are commercial and industrial uses, including a concrete supplier and gravel mine. To the south, the Project site is bound by State Route 210 (SR-210), across which are two large water storage tanks, single-family residential uses, and commercial uses. To the west, the Project site is bound by Flower Court, across which are single-family residential uses.

10. Other Public Agencies Whose Approval is Required (e.g., permits, financial approval, or participation agreements):

Table 1.A: Potential Permits and Approvals

Lead Agency	Permits/Approvals
City of Upland	• Initial Study/Mitigated Negative Declaration (IS/MND) Approval and Adoption of Mitigation Monitoring and Reporting Program • Development Plan Review • Grading Permit • Building Permit • General Plan Amendment • Zone Change
Other Agencies	
City of Upland Fire Department	• Certified Unified Program Agency (CUPA)
Southern California Edison	• Edison Right-of-Way (ROW) Easement

Source: LSA (2024).

11. Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resource Code section 21080.3.1? If so, is there a plan for consultation that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures regarding confidentiality, etc.?

Native American consultation was conducted by the City in compliance with AB 52 and SB18. As part of the consultation process, a review of the Sacred Lands File (SLF) by the Native American Heritage Commission (NAHC) indicated that the results of the file search were positive and NAHC identified methodologies and contacts for conducting the required AB 52 and SB 18 tribal consultation. The NAHC recommended that 25 Native American individuals representing the Agua Caliente, Cahuila, Gabrieleno, Gabrielino Tongva, Morongo, Quechan, San Manuel, Santa Rosa, Serrano, and Soboba groups be contacted for information regarding cultural resources that could be affected by the Project.

The City provided notice of the Project via certified mail on March 5, 2025, to Native American tribal contacts provided by the NAHC, as well as local Native American tribal representatives that previously requested to be notified of future projects proposed by the City in compliance with AB 52 and SB18. The City received responses from the Yuhaaviatam of San Manuel Nation (San Manuel Nation) and the Gabrieleno Band of Mission Indians – Kizh Nation (Kizh Nation).

Consultation with Native American tribes was conducted by the City of Upland in accordance with Public Resource Code section 21080.3.1 as described further in Section 4.18, Tribal Cultural Resources.

2.0 PROJECT DESCRIPTION

This document outlines the proposed San Antonio Water Company (SAWCo) Headquarters Project (Project), which is the subject of this Initial Study/Mitigated Negative Declaration (IS/MND) prepared in accordance with the California Environmental Quality Act (CEQA). The Project would result in the construction of a new 3,698-square-foot SAWCo headquarters and associated improvements, including a 4,066-square-foot maintenance building, maintenance yard, driveway, parking, solar cover, landscaping, and utility improvements. The City of Upland (City) is the Lead Agency responsible for reviewing the Project under CEQA.

2.1 PROJECT SITE

The following section describes the Project location, existing conditions, surrounding land uses, and the regulatory setting.

2.1.1 Project Location

The Project site spans approximately 4.92 acres and is located at 400 East 20th Street in the City of Upland, in San Bernardino County (Assessor's Parcel Number [APN] 1044-091-22). Situated in northwest Upland, the site is surrounded by a mix of residential, commercial, and industrial uses. The Project site is bound by East 20th Street to the north, undeveloped open space to the east, State Route 210 (SR-210) to the south, and Flower Court to the west.

Regional access to the site is provided by SR-210, with on/off ramps at Campus Avenue, approximately 0.47 mile to the east, and North Mountain Avenue approximately 1.37 mile to the west. **Figure 2-1** shows the regional and local context of the Project site. **Figure 2-2** shows an aerial photograph of the Project site and surrounding land uses.

2.1.2 Existing Conditions

The Project site is generally flat and largely undeveloped. Existing developments include a one-million-gallon water storage tank located underground at the northwestern corner of the parcel, a pump station located at the southwestern corner of the parcel, and a cellular building and tower located at the southeastern corner of the parcel. Approximately five SAWCo employees use the site daily for equipment and material storage. Existing landscaping features include 16 street trees and various shrubs along East 20th Street and Flower Court, and three trees in the southwestern corner of the Project site. Vehicular access is provided by an approximately 250-foot-long north-south oriented driveway located off East 20th Street along the eastern edge of the parcel and an additional access gate off East 20th Street northwest of the water storage tank.

The site includes several easements: one for public utilities, a second for flood control and water conservation, a third for storm drainage, and a fourth for water lines.

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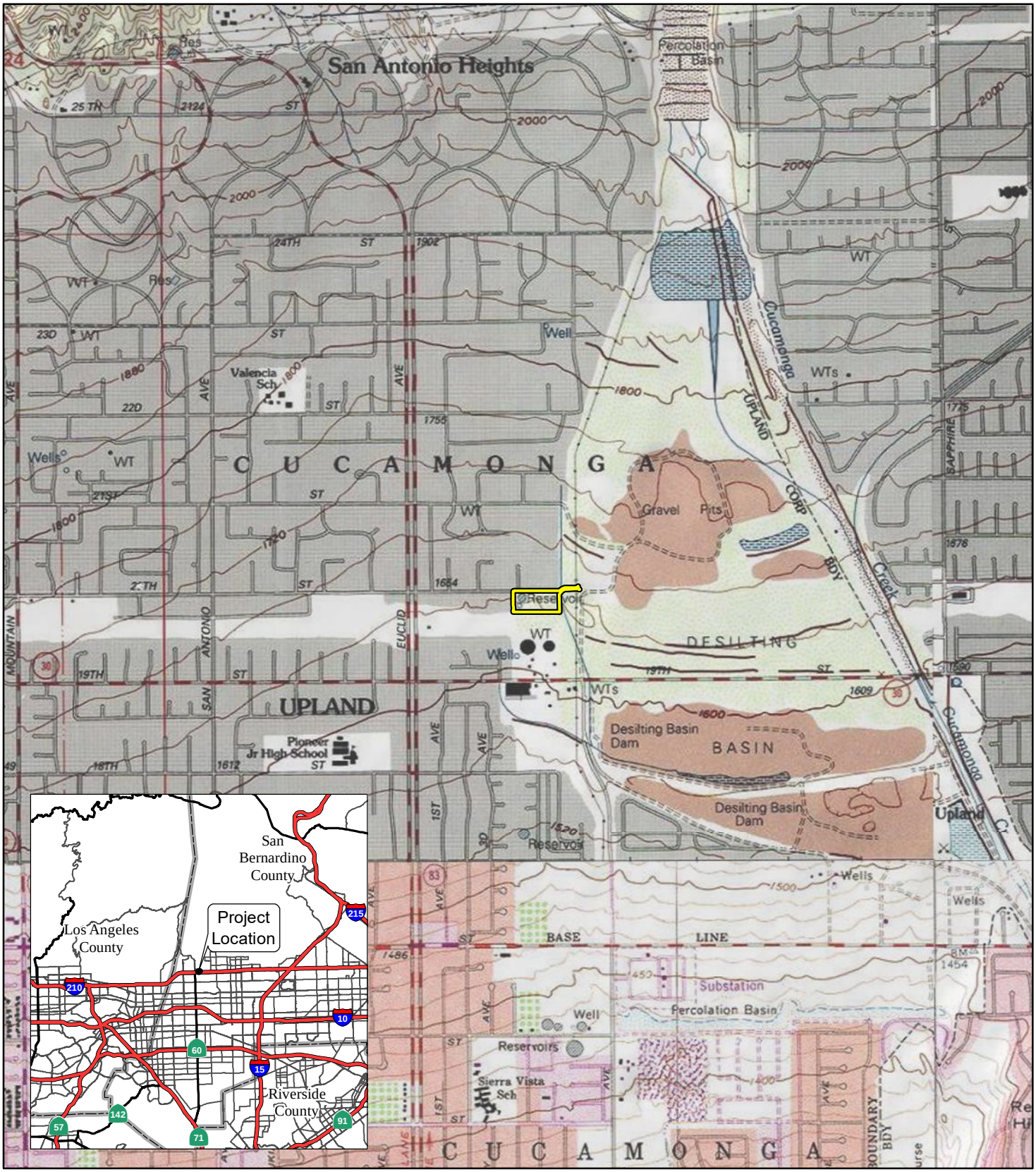

LSA

Project Location

FIGURE 2-1

N

0 1000 2000

FEET

San Antonio Water Company Headquarters

Project Location and Vicinity

SOURCE: USGS 7.5' Quad; Mt. Baldy (1988), Ontario (1981),Guasti (1981),Cucamongo Pea (1988),CA

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LEGEND

- Project Site Boundary

FIGURE 2-2

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FEET

SOURCE: Google Earth, 2024

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San Antonio Water Company Headquarters

Aerial Photograph and Surrounding Land Uses

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2.1.2.1 Surrounding Land Uses

As shown in **Figure 2-2**, the Project site is generally surrounded by a mix of residential, commercial, and industrial uses. To the north, across East 20th Street, are single-family residences. To the east, undeveloped open space owned by Southern California Edison Company, which borders the site, with commercial and industrial uses further east, including a concrete supplier and gravel mine. To the south, SR-210 separates the site from two large water storage tanks, single-family residences, and commercial uses. To the west, across Flower Court, are additional single-family residential homes.

2.1.2.2 Land Use and Zoning

The Project site is currently designated Single-Family Residential Low (SFR-L) in the City of Upland General Plan Land Use Map[1]. The SFR-L designation provides for the development of detached single-family units and allows for a density of zero to four dwelling units per acre. The City of Upland Zoning Map identifies the Project site as single-family residential RS-10,000 (RS-10), intended for lots with a minimum area of 10,000 square feet, accommodating no more than one single-family dwelling and its accessory buildings. These lots are characterized by larger single-family dwellings (i.e., a 1,600-square-foot-minimum floor area), ample open space, lush landscaping, and medium separations between single-family dwellings and/or permitted accessory buildings.

2.2 PROPOSED PROJECT

The Project would result in the construction of a new SAWCo headquarters and associated improvements as described in detail below.

2.2.1 Rezone and General Plan Amendment

The proposed use is not currently permitted at the site under the current SFR-L General Plan land use designation and RS-10 zoning. To comply with the City's General Plan and zoning regulations, the Project would require a General Plan amendment and a zone change to Public Utilities (PU) land use designation and Public/Institutional (PB/I) zoning. The PU designation accommodates landfills, flood control/recharge facilities, and public utilities, including gas, electricity, and water. The purpose of the PB/I zone is to allow for public and quasi-public facilities that serve the City's residents and visitors. The PU designation and PB/I zone permit a maximum Floor Area Ratio (FAR) of 0.5.

2.2.2 Building Program

As shown in **Figure 2-3**, the Project would result in the construction of a new 3,698-square-foot SAWCo headquarters and associated improvements including a 4,066-square-foot maintenance building, maintenance yard, driveway, parking, solar cover, landscaping, and utility improvements. The headquarters building would feature office space, meeting and conference rooms, a lobby, an archive room, a break room, two Americans with Disabilities Act (ADA) restrooms, a quiet room,

[1] City of Upland. 2015a. *City of Upland General Plan Update, Figure LU-1 General Plan Land Use*. September 14.

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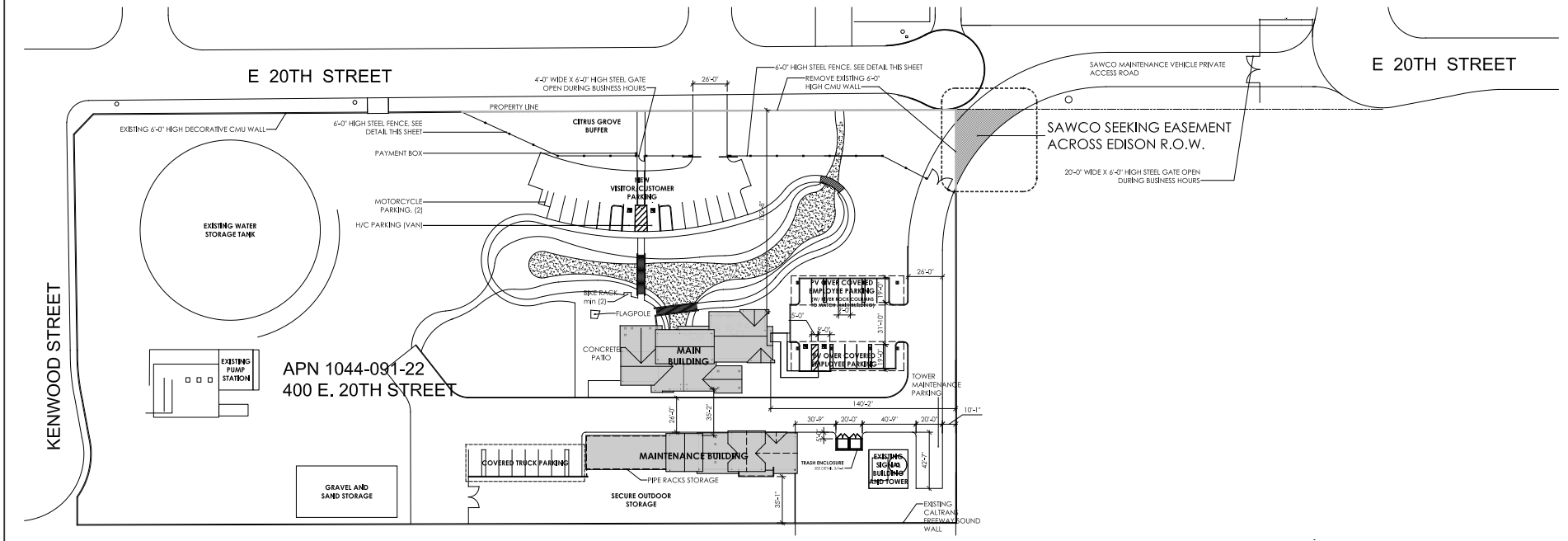

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FIGURE 2-3

N

0 60 120

FEET

SOURCE: CEDG, Inc.

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San Antonio Water Company Headquarters

Conceptual Site Plan

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a copy room, and a work area. The maintenance building would include storage space, an outdoor welding area, a motor repair room, electrical rooms, an ADA restroom, a locker room, and a maintenance office/break room. The existing water storage tank, pump station, and signal buildings and tower would remain in place. The buildings would be a maximum height of 23 feet and have a FAR of 0.07. Approximately ten people are expected to be employed on site.

2.2.3 Open Space and Landscaping

The Project would include a citrus grove buffer along the eastern half of the northern property line, along with various trees and shrubs around the parking areas and the main headquarters building. Approximately 46,077 square feet of landscaped area would be provided. Up to two of the existing street trees would be removed to accommodate the driveway off East 20th Street, and various shrubs and associated grassland would be removed to accommodate the driveway off Campus Avenue and East 20th Street. The three existing trees at the southwestern corner of the Project site would remain in place, and 51 new ornamental trees and 64 new citrus trees would be planted as part of the Project's landscape design.

2.2.4 Access, Circulation, and Parking

Vehicular access to the Project site would be provided via two paved driveways with gates for security. Two new driveways would be constructed, as shown in **Figure 2-3**. One new 26-foot-wide driveway would be constructed off of East 20th Street along the northern property boundary that would access the visitor and customer parking area. An additional 26-foot-wide driveway would enter the Project site at the northeastern corner and would connect to the intersection of Campus Avenue and East 20th Street approximately 275 feet east of the Project site. This driveway would cross undeveloped land owned by the Southern California Edison company and require an easement. This driveway would enter the Project site at the northeastern corner and run south along the eastern property line to access the covered employee parking area, maintenance building, and covered truck parking area. This driveway would serve as a SAWCo maintenance vehicle private access road and would be secured by a 20-foot-wide, 6-foot-tall steel gate located just west of the Campus Avenue and East 20th Street intersection that would be open during business hours. No public access will be allowed through this new driveway.

The visitor and customer parking lot would be located south of the citrus grove and north of the main headquarters building and would provide 14 surface parking spaces, including two ADA compliant parking spots. The employee parking area would be located east of the main headquarters building, would be covered by photovoltaic panels, and would include 14 surface parking spaces, including two ADA compliant parking spots. The Project would also provide eight covered truck parking spots west of the maintenance building.

2.2.5 Utilities and Infrastructure

The Project site is in an urban area with existing utilities, including water, sanitary sewer, storm drainage, electricity, and telecommunications. Natural gas is not proposed as part of the Project. The following sections detail the utility connections.

2.2.5.1 Water

The City owns and operates its water distribution system, serving residential, commercial, and industrial users within City limits, including the Project site. The Project would include new on-site water lines that would be constructed and connected to existing nearby water main lines in conformance with City standards.

2.2.5.2 Wastewater

The City also owns and operates the local sewer lines with wastewater treatment provided by reclamation facilities maintained by the Inland Empire Utilities Agency (IEUA). The Project would include new on-site sanitary sewer lines connected to existing nearby sanitary sewer main lines in compliance with City standards.

2.2.5.3 Stormwater

The existing water storage tank, structures, paving, and other impervious surfaces account for approximately 24,793 square feet (11.6 percent) of the 4.92-acre Project site. The remaining 189,566 square feet are pervious surfaces consisting of undeveloped exposed soil. There is currently no existing stormwater infrastructure on the Project site. Stormwater flows to the southwest to a natural ravine that discharges into an existing ditch along the freeway right-of-way which discharges to a City of Fontana storm drain along Poplar Avenue.

Post-construction, approximately 71,697 square feet (33.4 percent) of the Project site would be covered by impervious surfaces, while approximately 142,660 square feet (66.6 percent) would be covered by pervious surfaces, consisting of a landscaped area, undeveloped space, and bioretention area. Stormwater drains and catch basins would be installed throughout the site, connecting to an infiltration basin and an underground storage infiltration system that would be used for stormwater control, treatment, and infiltration.

2.2.5.4 Electricity

Electrical power is provided to the Project site and surrounding area by the Southern California Edison Company. The Project would connect to existing overhead electricity lines along East 20th Street. While City policy generally requires utility lines to be placed underground as part of development or infrastructure improvement projects, the City may exercise discretion to exempt certain components from this requirement[2]. The existing transmission lines located in front of the Project site would not be disturbed as part of the proposed activities. However, any new lateral connections associated with the Project would be installed underground on the site.

2.2.6 Demolition and Construction

Excavation for the Project would reach a maximum depth of 4–6 feet below ground surface, disturbing approximately 123,501 square feet of soil. It is anticipated that excavated soil would be used on site, and would not require the import or export of soil materials. Construction of the Project is anticipated to begin in 2025 and be completed by the end of 2026.

[2] City of Upland Municipal Code. Chapter 12.28. Underground Utilities.

2.3 PROJECT APPROVALS

While the City is the CEQA Lead Agency for the Project, other public agencies and private entities may also have approval authority or serve as a responsible and/or trustee agency. A list of these agencies and potential permits and approvals required are provided in **Table 2.A**.

Table 2.A: Potential Permits and Approvals

Lead Agency	Permits/Approvals
City of Upland	• Initial Study/Mitigated Negative Declaration (IS/MND) Approval and Adoption of Mitigation Monitoring and Reporting Program • Development Plan Review • Grading Permit • Building Permit • General Plan Amendment • Zone Change
Other Agencies	
San Bernardino County Fire District	• Certified Unified Program Agency (CUPA)
Southern California Edison	• Edison Right-of-Way (ROW) Easement

Source: LSA (2024).

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3.0 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist in Chapter 4.0.

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

3.1 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 in 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 a "Potentially Significant Impact" or "Potentially Significant Unless Mitigated" impact on the environment, 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 proposed project, nothing further is required.

Signature

8-5-25

Date

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4.0 CEQA ENVIRONMENTAL CHECKLIST

4.1 AESTHETICS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Except as provided in Public Resources Code Section 21099, 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 within a state scenic highway?	☐	☐	☐	☒
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from a publicly accessible vantage point.) If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

a. Would the project have a substantial effect on a scenic vista? ***(Less Than Significant Impact)***

In Upland, a scenic vista is defined as a view of undisturbed natural lands exhibiting a unique or unusual feature that comprises an important or dominant portion of the viewshed. Natural visual resources include mountain ranges, hillsides, low-lying valley, and streams. Scenic vistas may also be represented by a particular distant view that provides visual relief from less attractive views of nearby features. The City's General Plan does not designate any official scenic views or vistas within the City; however, scenic resources within Upland include surrounding mountains and hillsides located north of the City, including the San Gabriel Mountains and Mount Baldy. Additionally, the northern portion of the City is comprised of hilly terrain, which provides scenic views of the City and surrounding region. The General Plan also identifies the following Scenic Roadways: Euclid Avenue, Mountain Avenue, Foothill Boulevard, and Benson Avenue.[3]

The Project site is located in the northern portion of the City in a relatively flat area primarily surrounded by a mix of residential, commercial, and industrial development. The San Gabriel Mountains and Mount Baldy are visible to the north; however, these views are partially obstructed by existing development and trees. Euclid Avenue is located approximately 0.27 mile to the west; however, the Project site is not visible from Euclid Avenue due to existing development and trees. All other identified Scenic Roadways are located over a mile from the Project site and the Project

[3] City of Upland. 2015b. *Final Program Environmental Impact Report General Plan Update (GPU 08-03), Zoning Code Update (ZCU 08-03), Climate Action Plan, and Cable Airport Land Use Compatibility Plan Update SCH No. 2012041006).* September 28.

site is not visible from these corridors due to existing development, trees, and intervening topography.

The Project site is visible from its northern and western boundaries by vehicles and pedestrians traveling along East 20th Street and Flower Court, respectively. The Project site is also partially visible from North Campus Avenue and East 20th Street, the intersection of which would connect to the new driveway associated with the Project. The surrounding views primarily consist of urban views of single-family residences to the north and west. Open space is visible in foreground views to the east, with commercial development visible in background views. Views to the south are largely obstructed by an existing masonry wall that runs along the southern property boundary.

Buildings in the vicinity of the Project site primarily include residential and commercial buildings that range from one to two stories in height. The proposed headquarters and maintenance buildings would be two stories with a maximum height of 23 feet. As such, the height and mass of the proposed structure would be similar to the surrounding development. Furthermore, the Project would include new landscaping and trees along the perimeter of the Project site and within the surface parking lot, shielding the proposed building and improving the site's overall visual appearance. Therefore, public views of the Project site from surrounding areas would generally blend with surrounding urban development. The Project would not result in a substantial adverse effect on a scenic vista and this impact would be less than significant.

b. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway? ***(No Impact)***

The Project is not located within the vicinity of any State Scenic Highways.[4] State Route (SR) 142 is the nearest eligible State Scenic Highway, which is located approximately 11.6 miles southwest of the Project site. The nearest Officially Designated State Scenic Highway is SR-2, which is located 16 miles north of the Project site. Due to distance, topography, and intervening development, no portion of the Project site or surrounding area is visible from the officially designated portion of SR-2 or the eligible portion of SR-142. Therefore, no impacts to scenic resources, including trees, rock outcroppings, or historic buildings visible from a State Scenic Highway would occur. No mitigation is required.

c. In non-urbanized areas, would the project substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from a publicly accessible vantage point.) If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality? ***(Less Than Significant Impact)***

The Project site is located within an urbanized area. As noted in Chapter 2.0, Project Description, the Project site is currently located within the single-family residential RS-10,000 (RS-10) zone but a zone change to Public/Institutional (PB/I) zoning is proposed. The purpose of the PB/I zone is to

[4] California Department of Transportation (Caltrans). 2018. *California State Scenic Highway System Map.* Website: https://caltrans.maps.arcgis.com/apps/webappviewer/index.html?id=465dfd3d807c46cc8e8057116f1aacaa (accessed June 20, 2024).

allow for public and quasi-public facilities that serve Upland residents and visitors. Permitted uses in the PB/I zone include public schools; parks and playgrounds; community centers; museums, cultural, and interpretive facilities; public libraries; governmental offices; police and fire stations; and hospitals.

The PB/I zone allows a maximum floor area ratio (FAR) of 0.5 and a maximum structure height of 45 feet. The Project would have a FAR of 0.07 and a maximum structure height of 23 feet. Structure setback standards in the PB/I Zone include a minimum 20-foot front setback and a minimum 20-foot rear setback. The Project would have a front setback of 152.8 feet and a rear setback of 35.1 feet. Furthermore, the Project would be required to undergo Development Plan Review per the City's Municipal Code Chapter 17.44.030 which would provide for the review of the physical improvements to the Project site, including the overall building scale, massing, and design to ensure compatibility and compliance with City requirements governing scenic quality. As detailed in the City's Municipal Code Chapter 17.44.030 (H. Findings), the approval of an application for Development Review would require compliance with applicable standards in the Zoning Ordinance, other City ordinances, the General Plan, and any other applicable community or specific plans, and the following findings:

1. The design and layout of the proposed project will not interfere with the use and enjoyment of existing and future neighboring properties and structures.

2. The proposed architectural design makes use of appropriate materials, texture, and color, and will remain aesthetically appealing and appropriately maintained.

3. The proposed landscaping design, including color, location, size, texture, type, and coverage of plant materials, as well as provisions for irrigation, maintenance, and protection of landscaping elements, will complement structures and provide an attractive environment.

4. The proposed design will not be materially detrimental to the public health, safety, or welfare, or be injurious to the property or improvements in the vicinity of the proposed project.

Therefore, with approval of the required Development Plan Review, the Project would not conflict with applicable zoning and other regulations governing scenic quality, and impacts related to applicable zoning and other regulations governing scenic quality would be less than significant. No mitigation is required.

d. Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area? ***(Less Than Significant Impact)***

The Project site is located in an urbanized area, which is subject to preexisting exterior lighting from surrounding residential, commercial, and industrial development and existing street lighting. The Project would introduce new sources of light and glare to the area in the form of new windows, interior lighting, and exterior safety and security lighting. However, new sources of light and glare associated with the Project would not be substantial in the context of existing lighting sources and lighting associated with the Project would be consistent with surrounding residential, commercial,

and industrial uses. Furthermore, the Project would be subject to the following standards related to outdoor lighting per Chapter 17.14 Outdoor Lighting, of the City's Municipal Code[5]:

- Light trespass that results in glare is prohibited.
- All non-residential outdoor lighting shall be located, adequately shielded, and directed such that no direct light falls outside the property line or into the public right-of-way.
- Luminaires shall be so designed and shielded by horizontal cutoff to eliminate all light directed above the horizontal plane. The lower edge of the luminaire's housing shall extend below the entire light source and all glassware so that any light emitted above the horizontal is eliminated. Light-directing refractors shall be considered to be light sources.
- Outdoor lighting shall comply with the State of California Title 24 Energy Efficiency Standards outdoor lighting requirements. If a conflict between the requirements of this chapter and the State of California Title 24 Energy Efficiency Standards arises, that which produces the least glare shall apply.
- Lighting that flashes, flickers, blinks, changes color, or changes intensity such that it is distracting or may be confused with traffic or emergency signals shall be prohibited.
- Parking area luminaires shall be no taller than 20 feet as measured from the adjacent grade to their tallest point. Taller poles may be approved by the Development Services Director.
- Lighting, where provided to illuminate parking, sales, or display areas shall be hooded or shielded.

Daytime glare would not be substantial as no highly-reflective glass elements are proposed as part of the Project. Therefore, the Project would not create a new source of substantial light or glare which would adversely affect day or nighttime views in the area. With adherence to Title 24 and Municipal Code requirements, the Project would have a less than significant impact related to new sources of substantial light and glare, and no mitigation is required.

[5] City of Upland. Zoning Code, Title 17 Zoning Ordinance, Part 3 General Regulations, Chapter 17.14 Outdoor Lighting.

4.2 AGRICULTURE AND FORESTRY RESOURCES

In determining whether impacts to 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 the forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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 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?	☐	☐	☐	☒

a. Would the project 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)***

The Project site is located within an urbanized area of the City. There are no agricultural uses located within or adjacent to the Project site. Additionally, the site is classified as "Urban and Built-Up Land" and "Other Land" by the State Department of Conservation.[6] Therefore, development of the Project would not convert agricultural land to a non-agricultural use. The Project would not

[6] California Department of Conservation (DOC). 2022. California Important Farmland Finder (map). Website: maps.conservation.ca.gov/dlrp/ciff/ (accessed June 20, 2024).

result in the conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to a non-agricultural use, and no impact would occur.

b. Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract? ***(No Impact)***

As noted in Chapter 2.0, Project Description, the Project site is located within the single-family residential RS-10,000 (RS-10) zone and would be changed to Public/Institutional (PB/I) zoning, which is intended to allow for public and quasi-public facilities that serve Upland residents and visitors. RS-10 and PB/I zoning do not allow for agricultural production, and the Project site is not protected by, or eligible for, a Williamson Act contract. Implementation of the Project would not conflict with existing zoning for agricultural use, nor would it conflict with a Williamson Act contract. No impact would occur, and no mitigation is required.

c. Would the project 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)***

The Project site is located within an existing urban area that is currently zoned RS-10 and is proposed to be zoned as PB/I within the City. The Project site is not zoned as forest land (as defined in Public Resources Code [PRC] Section 12220(g)), timberland (as defined by PRC Section 4526), or Timberland Production (as defined by Government Code Section 51104(g)). The Project would not conflict with existing zoning for, or cause rezoning of, forest land or conversion of forest land to non-forest uses, and no impact would occur.

d. Would the project result in the loss of forest land or conversion of forestland to non-forest use? ***(No Impact)***

Refer to Section 4.2.c. The Project site is located in an area that supports industrial, commercial, and residential developments. The Project site is not occupied by forest land. The Project would not result in the loss of forest land or conversion of forest land to non-forest uses, and no impact would occur.

e. Would the project 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)***

Refer to Sections 4.2.a and 4.2.c. The Project site is located within an existing urban area that supports industrial, commercial, and residential developments within the City. The Project site is currently zoned RS-10 and is proposed to be zoned as PB/I, which do not allow agricultural or forest uses. The Project would not result in the conversion of farmland to non-agricultural uses or forest land to non-forest uses nor would the Project adversely affect agricultural or forestry resources. No impact would occur, and no mitigation is required.

4.3 AIR QUALITY

Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	☒	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☒	☐

The following discussion and analyses are based on the findings included in the Air Quality and Greenhouse Gas Technical Memorandum[7] completed for the Project, which is included as **Appendix A** to this IS/MND.

*a. Would the project conflict with or obstruct implementation of the applicable air quality plan? **(Less Than Significant Impact)***

The Project site is located within the South Coast Air Basin (Basin), which includes the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties and all of Orange County, and is within the jurisdictional boundaries of the South Coast Air Quality Management District (SCAQMD).

The SCAQMD administers the Air Quality Management Plan (AQMP) for the Basin, which is a comprehensive document outlining an air pollution control program for attaining all California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS).[8] The most recent adopted AQMP is the 2022 AQMP, which was adopted by the SCAQMD Governing Board in December 2022. The 2022 AQMP builds upon measures already in place from previous AQMPs. It also includes a variety of additional strategies such as regulation, accelerated deployment of available cleaner technologies (e.g., zero emissions technologies, when cost-effective and feasible, and low nitrogen oxides (NO_X) technologies in other applications), best management

[7] LSA Associates, Inc. (LSA). 2024a. *Air Quality and Greenhouse Gas Technical Memorandum for the Proposed San Antonio Water Headquarters in Upland, California* (LSA Project No. 20241723). November 19.

[8] South Coast Air Quality Management District (SCAQMD). 2022. *2022 Air Quality Management Plan*. Website: www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/final-2022-aqmp/final-2022-aqmp.pdf?sfvrsn=16 (accessed November 2024).

practices, co-benefits from existing programs (e.g., climate and energy efficiency), incentives, and other Clean Air Act (CAA) measures to achieve the 2015 8-hour ozone standard.

The City of Upland General Plan is consistent with the Southern California Association of Governments (SCAG) Regional Comprehensive Plan Guidelines[9] and the SCAQMD AQMP. The revisions to accommodate this Project will not change that. Pursuant to the methodology provided in the SCAQMD *CEQA Air Quality Handbook*,[10] consistency with the Basin AQMP is affirmed when a project (1) would not increase the frequency or severity of an air quality standards violation or cause a new violation, and (2) is consistent with the growth assumptions in the AQMP. Consistency review is presented as follows:

1. The Project would result in short-term construction and long-term operational pollutant emissions that are all less than the CEQA significance emissions thresholds established by SCAQMD, as demonstrated below under Section 4.3.b; therefore, the Project would not result in an increase in the frequency or severity of an air quality standards violation or cause a new air quality standards violation.

2. The *CEQA Air Quality Handbook* indicates that consistency with AQMP growth assumptions must be analyzed for new or amended General Plan elements, Specific Plans, and significant projects. Significant projects include airports, electrical generating facilities, petroleum and gas refineries, designation of oil drilling districts, water ports, solid waste disposal sites, and offshore drilling facilities; therefore, the Project is not defined as significant. According to SCAG's *Connect SoCal: The 2024–2050 Regional Transportation Plan/Sustainable Communities Strategy* (2024–2050 RTP/SCS), the City of Upland's households and jobs are forecast to increase by approximately 5,700 households and 4,900 jobs, respectively, between 2019 and 2050. Based on information provided by the Project Applicant, the Project would have approximately 10 employees. The number of new employees generated by the Project would fall within the 4,900 projected jobs for the City. Accordingly, the Project's labor demand would not be expected to substantially increase population, households, or employment in Upland since the number of employees associated with the Project would be a small fraction (approximately 0.2 percent) of the projected job growth for the City. Therefore, implementation of the Project would not interfere with SCAG's ability to implement the regional strategies outlined in the 2024–2050 RTP/SCS.

Based on the consistency analysis presented above, the Project would be consistent with the regional AQMP. Therefore, the Project would not conflict with or obstruct implementation of the applicable air quality plan. Impacts would be less than significant, and no mitigation is required.

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9 Southern California Association of Governments (SCAG). 2008. *Final 2008 Regional Comprehensive Plan*. Website: scag.ca.gov/sites/main/files/file-attachments/f2008rcp_complete.pdf?1604263359 (accessed November 2024).

10 South Coast Air Quality Management District (SCAQMD). 1993. *CEQA Air Quality Handbook.* Website: www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/ceqa-air-quality-handbook-(1993) (accessed November 2024).

b. Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard? ***(Less Than Significant Impact)***

The Basin is currently designated as nonattainment for the federal and State standards for ozone (or smog) (O_3) and particulate matter less than 2.5 microns in size ($PM_{2.5}$). In addition, the Basin is in nonattainment for the particulate matter less than 10 microns in size (PM_{10}) standard.[11] The Basin's nonattainment status is attributed to the region's development history. Past, present, and future development projects contribute to the region's adverse air quality impacts on a cumulative basis. By its very nature, air pollution is largely a cumulative impact. No single project is sufficient in size to, by itself, result in nonattainment of an ambient air quality standard. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's contribution to the cumulative impact is considerable, then the project's impact on air quality would be considered significant. The following analysis assesses the potential Project-level air quality impacts associated with construction and operation of the Project.

Construction Emissions. During construction, short-term degradation of air quality may occur due to the release of particulate matter emissions (i.e., fugitive dust) generated by ground disturbance, paving, and other activities. Emissions from construction equipment are also anticipated and would include carbon monoxide (CO), NO_x, volatile organic compounds (VOCs), directly emitted $PM_{2.5}$ or PM_{10}, and toxic air contaminants such as diesel exhaust particulate matter.

Project construction activities would include grubbing and land clearing, grading, drainage, utilities, building construction, and paving activities. Sources of fugitive dust would include disturbed soils at the construction site. Unless properly controlled, vehicles leaving the site would deposit dirt and mud on local streets, which could be an additional source of airborne dust after it dries. PM_{10} emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM_{10} emissions would depend on soil moisture, silt content of soil, wind speed, and amount of operating equipment. Larger dust particles would settle near the source, whereas fine particles would be dispersed over greater distances from the construction site.

Water or other soil stabilizers can be used to control dust, resulting in emission reductions of 50 percent or more. SCAQMD has established Rule 403: Fugitive Dust, which would require the Project Applicant to implement measures that would reduce the amount of particulate matter generated during the construction period. The Rule 403 measures that were incorporated in this analysis include:[12]

- Water active sites at least twice daily (locations where earth disturbance is to occur shall be thoroughly watered prior to earthmoving).

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11 SCAQMD. 2024a. NAAQS and CAAQS Attainment Status for South Coast Air Basin. Website: www.aqmd.gov/docs/ default-source/clean-air-plans/air-quality-management-plans/naaqs-caaqs-feb2016.pdf (accessed November 2024).

12 SCAQMD. 2024b. South Coast AQMD Rule Book. Website: www.aqmd.gov/home/rules-compliance/rules (accessed November 2024).

- Cover all trucks hauling dirt, sand, soil, or other loose materials, or maintain at least 2 feet (0.6 meter) of freeboard (vertical space between the top of the load and the top of the trailer) in accordance with the requirements of California Vehicle Code Section 23114.

- Reduce traffic speeds on all unpaved roads to 15 miles per hour or less.

In addition to dust-related PM_{10} emissions, heavy trucks and construction equipment powered by gasoline and diesel engines would generate CO, sulfur oxides (SO_x), NO_x, VOCs, and some soot particulate ($PM_{2.5}$ and PM_{10}) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase slightly while those vehicles idle in traffic. These emissions would be temporary in nature and limited to the immediate area surrounding the construction site.

Construction emissions were estimated for the Project using California Emissions Estimator Model version 2022.1 (CalEEMod) and are summarized in Table 4.3.A. CalEEMod output sheets are included in Appendix A.

Table 4.3.A: Short-Term Regional Construction Emissions

Construction Phase	Maximum Daily Regional Pollutant Emissions (lbs/day)					
	VOCs	NO_X	CO	SO_X	Total PM_{10}	Total $PM_{2.5}$
Site Preparation	1.3	12.1	12.7	<1	2.3	1.3
Grading	1.6	14.1	15.3	<1	2.6	1.5
Building Construction	1.1	9.1	11.3	<1	<1	<1
Architectural Coating	0.4	0.9	1.3	<1	<1	<1
Paving	0.5	4.5	7.4	<1	<1	<1
Peak Daily Emissions	**1.6**	**14.1**	**15.3**	**<1**	**2.6**	**1.5**
SCAQMD Threshold	**75**	**100**	**550**	**150**	**150**	**55**
Significant?	**No**	**No**	**No**	**No**	**No**	**No**

Source: Compiled by LSA (November 2024).
Note: The maximum emissions of summer and winter modeling results were used to evaluate construction emissions impacts. CalEEMod output sheets are provided in Appendix A. Values may not appear to add up correctly due to rounding.
CalEEMod = California Emissions Estimator Model
CO = carbon monoxide
lbs/day = pounds per day
NO_x = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
SCAQMD = South Coast Air Quality Management District
SO_x = sulfur oxides
VOCs = volatile organic compounds

The results shown in Table 4.3.A indicate the Project would not exceed the significance criteria for daily VOCs, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$ emissions. Therefore, construction of the Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in nonattainment under an applicable federal or State AAQS. Impacts would be less than significant, and no mitigation is required.

Operational Air Quality Impacts. Long-term air pollutant emissions associated with operation of the Project include emissions from area, energy, and mobile sources. Area-source emissions include architectural coatings, consumer products, and landscaping. Energy-source emissions result from utility plants generating electricity used by the Project. Typically, energy-source emissions would also include emissions from natural gas consumption; however, the Project would not use natural

gas. Mobile-source emissions are from vehicle trips associated with operation of the Project. Mobile source emissions include VOCs and NO_X emissions that contribute to the formation of O_3. Additionally, PM_{10} emissions result from running exhaust, tire and brake wear, and the entrainment of dust into the atmosphere from vehicles traveling on paved roadways. Long-term operational emissions associated with the Project were calculated using CalEEMod. Table 4.3.B provides the estimated existing emission estimates and the Project's estimated operational emissions.

Table 4.3.B: Project Operational Emissions

Emission Type	Pollutant Emissions (lbs/day)					
	VOCs	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Mobile Sources	0.4	0.5	4.5	<0.1	1.1	0.3
Area Sources	0.2	<0.1	0.3	<0.1	<0.1	<0.1
Energy Sources	0	0	0	0	0	0
Total Project Emissions	**0.6**	**0.5**	**4.8**	**<0.1**	**1.1**	**0.3**
SCAQMD Threshold	55	55	550	150	150	55
Exceeds Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Source: Compiled by LSA (November 2024).
Note: The maximum of summer and winter modeling results were used to evaluate the operational emission impacts. CalEEMod output sheets are provided in Appendix A. Some values may not appear to add correctly due to rounding.
CalEEMod = California Emissions Estimator Model
CO = carbon monoxide
lbs/day = pounds per day
NO_X = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
SCAQMD = South Coast Air Quality Management District
SO_X = sulfur oxides
VOCs = volatile organic compounds

The results shown in Table 4.3.B indicate the Project would not exceed the significance criteria for daily VOCs, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$ emissions. Therefore, operation of the Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in nonattainment under applicable NAAQS or CAAQS. Impacts would be less than significant, and no mitigation is required.

c. *Would the project expose sensitive receptors to substantial pollutant concentrations?* ***(Less Than Significant Impact)***

Sensitive receptors are defined as people that have an increased sensitivity to air pollution or environmental contaminants. Sensitive receptor locations include schools, parks and playgrounds, daycare centers, nursing homes, hospitals, and residential dwelling units. The nearest sensitive receptors are the existing single-family residences to the west approximately 90 feet from the Project boundary.[13] Although the majority of the construction activities would occur in the eastern half of the Project site much further from these residences, this analysis assumes that at some point construction equipment could operate along the western boundary of the Project site. As the Project's operational emissions would occur in the eastern portion of the Project site around the

[13] Distance for construction air quality impact potential includes the assumption that heavy construction equipment would operate adjacent to the proposed project boundary, which is approximately 90 feet from the center of the nearest off-site structures where a person would live.

proposed buildings, the closest sensitive receptors to these emissions are the existing single-family residences to the north approximately 300 feet from the centroid of the operational area.

The following section describes the potential impacts on sensitive receptors from construction and operation of the Project and includes a CO hot-spot analysis and a localized significance analysis.

Long-Term Microscale (CO Hot-Spot) Analysis. Vehicular trips associated with the Project would contribute to congestion at intersections and along roadway segments in the vicinity of the Project site. Localized air quality impacts would occur when emissions from vehicular traffic increase as a result of the Project. The primary mobile-source pollutant of local concern is CO, a direct function of vehicle idling time and, thus, of traffic flow conditions. CO transport is extremely limited. Under normal meteorological conditions, it disperses rapidly with distance from the source. However, under certain extreme meteorological conditions, CO concentrations near a congested roadway or intersection may reach unhealthful levels, thereby affecting local sensitive receptors (e.g., residents, schoolchildren, the elderly, and hospital patients).

Typically, high CO concentrations are associated with roadways or intersections operating at unacceptable levels of service or with extremely high traffic volumes. In areas with high ambient background CO concentrations, modeling is recommended to determine a project's effect on local CO levels.

An assessment of Project-related impacts on localized ambient air quality requires that future ambient air quality levels be projected. Existing CO concentrations in the immediate Project vicinity are not available. Ambient CO levels monitored at the Fontana-Arrow Highway station (the closest station to the Project site), showed a highest recorded 1-hour concentration of 1.9 parts per million (ppm) (the State standard is 20 ppm) and a highest 8-hour concentration of 1.4 ppm (the State standard is 9 ppm) from 2021 to 2023. The highest CO concentrations would normally occur during peak traffic hours; hence, CO impacts calculated under peak traffic conditions represent a worst-case analysis. Reduced speeds and vehicular congestion at intersections result in increased CO emissions.

The Project is expected to generate 85 new average daily trips, with 8 net new trips occurring in the a.m. peak hour and 10 net new trips occurring in the p.m. peak hour.[14] Therefore, given the extremely low level of CO concentrations in the Project area and the lack of traffic impacts at any intersections, Project-related vehicles are not expected to result in CO concentrations exceeding the State or federal CO standards. No CO hot spots would occur, and the Project would not result in any Project-related impacts on CO concentrations.

Localized Significance Thresholds Analysis. A Localized Significance Thresholds (LST) analysis was completed to show the construction and operational impacts to the nearest sensitive receptors to the Project site, based on a 4.92-acre daily disturbance area for construction and a 4.92-acre area for operations. As previously discussed, the nearest sensitive receptors are 90 feet to the west during construction and 300 feet to the north after construction during operations.

By design, the localized impact analysis only includes on-site sources; however, the CalEEMod outputs do not separate on-site and off-site emissions for mobile sources. For a worst-case scenario

[14] LSA. 2024b. *Traffic Impact Analysis San Antonio Water Headquarters Project*. November.

assessment, the emissions detailed in Table 4.3.C assume all area- and energy-source emissions would occur on site, and 5 percent of the Project-related new mobile sources (which is an estimate of the amount of Project-related vehicle travel would occur on site). Considering the total trip length included in CalEEMod, the 5 percent assumption is conservative. Table 4.3.C shows the results of the LST analysis during Project construction and operation.

Table 4.3.C: Project Localized Construction and Operational Emissions

Source	Pollutant Emissions (lbs/day)			
	NO_X	CO	PM_{10}	$PM_{2.5}$
Construction Emissions				
On-Site Emissions	14	15	3	2
Localized Significance Threshold	**270**	**2,230**	**18**	**9**
Significant?	**No**	**No**	**Yes**	**Yes**
Operational Emissions				
On-Site Emissions	<1	<1	<0.1	<0.1
Localized Significance Threshold	**361**	**4,742**	**18**	**5**
Significant?	**No**	**No**	**No**	**No**

Source: Compiled by LSA (November 2024).
Note: Source Receptor Area 32, emissions based on construction disturbing the entire site and operations occurring on the full project site. LSTs at a distance of 90 feet for construction and 300 feet for operations.
CO = carbon monoxide
lbs/day = pounds per day
LSTs = Localized Significance Thresholds
NO_X = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size

As shown in Table 4.3.C, the Project would not result in an exceedance of a SCAQMD LST during Project construction or operation. During construction, construction contractors would be required to implement measures to reduce or eliminate emissions by implementing SCAQMD Rule 403 dust control measures.[15] In addition, the maximum daily emissions associated with Project construction emissions indicate the Project would not exceed the significance criteria for VOCs, NO, CO, SO_x, PM_{10}, or $PM_{2.5}$ emissions. Therefore, the emissions associated with construction of the Project would not be expected to exceed the most stringent applicable federal or State ambient air quality standards. It should be noted that the ambient air quality standards are developed and represent levels at which the most susceptible persons (children and the elderly) are protected. In other words, the ambient air quality standards are purposefully set low to protect children, the elderly, and those with existing respiratory problems. Therefore, given the temporary nature of short-term construction impacts, and the absence of any exceeded threshold of significance related to construction impacts, construction of the Project would not exceed SCAQMD thresholds and would not expose nearby sensitive receptors to substantial pollutant concentrations. No significant health risk would occur from Project construction emissions.

Similarly, as indicated in Table 4.3.B, operation of the Project would not exceed the significance criteria for VOCs, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$ emissions.

15 SCAQMD. 2024b. Op. cit.

The SCAQMD's numeric regional mass daily emissions thresholds are based in part on Section 180 (e) of the federal Clean Air Act. It should be noted that the numeric regional mass daily emissions thresholds have not changed since their adoption as part of SCAQMD's *CEQA Air Quality Handbook* published in 1993 (over 30 years ago).[16] The numeric regional mass daily emission thresholds are also intended to provide a means of consistency in significance determination within the environmental review process.

As noted in the Brief of Amicus Curiae by the SCAQMD,[17] the SCAQMD has acknowledged that for criteria pollutants, it would be extremely difficult, if not impossible, to quantify health impacts for various reasons, including modeling limitations as well as where in the atmosphere air pollutants interact and form.

Additionally, the SCAQMD acknowledges that health effects quantification from O_3, as an example, is correlated with the increases in ambient levels of O_3 in the air (concentration) that an individual person breathes. The SCAQMD goes on to state that it would take a large amount of additional emissions to result in a modeled increase in ambient O_3 levels over the entire region. The SCAQMD states that based on its own modeling in its 2012 AQMP,[18] a reduction of 432 tons (864,000 pounds) per day of NO_X and a reduction of 187 tons (374,000 pounds) per day of VOCs would reduce O_3 levels at the highest monitored site by only 9 parts per billion (ppb). As such, the SCAQMD concludes that it is not currently possible to accurately quantify O_3-related health impacts caused by NO_X or VOC emissions from relatively small projects (defined as projects that are not regional in scope) due to photochemistry and regional model limitations (see page 11 of the SCAQMD Brief of Amicus Curiae).

To underscore this point, the SCAQMD goes on to state that it has only been able to correlate potential health outcomes for very large emissions sources. As part of its rulemaking activity, specifically 6,620 pounds per day (lbs/day) of NO_X and 89,180 lbs/day of VOCs were expected to result in approximately 20 premature deaths per year and 89,947 school absences due to O_3. As identified in Tables 4.3.A and 4.3.B, NO_X and VOC emissions during Project construction and operation would be well below 6,620 lbs/day of NO_X and 89,180 lbs/day of VOCs.

Due to the small size of the Project in relation to the overall Basin, the level of emissions is not sufficiently high to use a regional modeling program to correlate health effects on a Basin-wide level. On a regional scale, the quantity of emissions from the Project is incrementally minor. Because the SCAQMD has not identified any other methods to quantify health impacts from small projects and due to the size of the Project, it is speculative to assign any specific health effects to small Project-related emissions. However, based on this localized analysis, the Project would not expose sensitive receptors to substantial pollutant concentrations. Therefore, the Project would not expose

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16 SCAQMD. 1993. Op. cit.

17 SCAQMD. 2015. *Amicus Curiae Brief of South Coast Air Quality Management District*. April. Website: www.courts.ca.gov/documents/9-s219783-ac-south-coast-air-quality-mgt-dist-041315.pdf (accessed November 2024).

18 SCAQMD. 2012. *Final 2012 Air Quality Management Plan*. Website: https://www.aqmd.gov/home/air-quality/air-quality-management-plans/air-quality-mgt-plan/final-2012-air-quality-management-plan (accessed November 2024).

sensitive receptors to substantial levels of pollutant concentrations, impacts would be less than significant.

d. Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people? ***(Less Than Significant Impact)***

Heavy-duty equipment on the Project site during construction would emit odors, primarily from equipment exhaust. However, the construction activity would cease after individual construction is completed. No other sources of objectionable odors have been identified for the Project during construction.

The Project would be required to comply with SCAQMD Rule 402. SCAQMD Rule 402 regarding nuisances states, "A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property."

Examples of odor-generating projects are wastewater treatment plants, compost facilities, landfills, solid-waste transfer stations, fiberglass manufacturing facilities, paint/coating operations (e.g., auto body shops), dairy farms, petroleum refineries, asphalt batch plants, chemical manufacturing, and food manufacturing facilities. The Project would include a new 3,698-square-foot SAWCo headquarters and associated improvements and a 4,066-square-foot maintenance building, maintenance yard, driveway, parking, solar cover, and landscaping; therefore, the Project would not include land uses that would be expected to generate odors.

Once operational, the Project would involve minor odor-generating activities (e.g., trash, landscape equipment, application of exterior paints, etc.). However, unlike the odor-generating land uses identified above, these are not considered potential generators of odor that could affect a substantial number of people. Further, Project-generated refuse would be stored in covered containers and would be removed at regular intervals to minimize odors. In addition, the Project would be required to comply with the California Department of Resources Recycling and Recovery (CalRecycle) waste diversion program and recycling of solid and organic waste. Therefore, operational uses are not anticipated to emit any objectionable odors. Therefore, the Project would not result in other emissions (e.g., those leading to odors) adversely affecting a substantial number of people. Impacts would be less than significant, and no mitigation is required.

4.4 BIOLOGICAL RESOURCES

	Potentially Significant Impact	Less Than Significant 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 Wildlife 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, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☐	☒
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, 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?	☐	☐	☐	☒

The following discussion and analyses are based on the findings included in the Biological Resources Assessment[19] completed for the Project, which is included as **Appendix B** to this IS/MND. The Biological Resources Assessment included a literature review and record search in addition to a reconnaissance field survey completed on July 19, 2024.

a. Would the project 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 Wildlife or U.S. Fish and Wildlife Service? ***(Less Than Significant with Mitigation Incorporated)***

Special-status species are defined as follows:

[19] LSA. 2024c. *Biological Resources Assessment, San Antonio Water Company Headquarters, Upland, San Bernardino County, California (APN 1044-091-22).* September.

- Species that are listed, formally proposed, or designated as candidates for listing as threatened or endangered under the federal Endangered Species Act or California Endangered Species Act.
- Plant species assigned to California Rare Plant Ranks (CRPR) 1A, 1B, 2A, 2B, or 3.
- Animal species designated as Species of Special Concern or Fully Protected Species by the California Department of Fish and Wildlife (CDFW).
- Species that meet the definition of rare, threatened, or endangered under Section 15380 of the CEQA Guidelines.
- Species considered as a taxon of special concern by local agencies.

The Project site is generally flat and largely undeveloped. The site itself primarily consists of nonnative, disturbed vegetation. Existing developments include a one-million-gallon water storage tank located underground at the northwestern corner of the parcel, a pump station located at the southwestern corner of the parcel, and a cellular building and tower located at the southeastern corner of the parcel. The disturbed vegetation occurring within the Project site is considered low-quality habitat for most native wildlife species.

A literature review and records search were conducted to determine which special-status biological resources have the potential to occur on or within the general vicinity of the Project site. In addition to the literature review, a general habitat assessment or field investigation of the Project site was conducted to document existing conditions and assess the potential for special-status biological resources to occur within the Project site.

No special-status plant or wildlife species were observed during the field survey. The Biological Resources Assessment identifies special-status plant and animal species with California Natural Diversity Database (CNDDB) record search occurrence and includes detailed information about each species' habitat and distribution, as well as State and federal status designations and the probability of occurrence within the Project disturbance limits. As detailed in the Biological Resources Assessment prepared for the Project, no regionally occurring special-status animal species are expected to be present on the Project site or to be adversely affected by the Project due to the lack of suitable habitats and the developed/disturbed conditions within the direct disturbance limits of the Project. Additionally, no federal or State-listed endangered plant species are expected to occur on the Project site due to the lack of suitable soils.

Burrowing owls, a non-listed State species of special concern, have a low to moderate probability of occurrence within the Project site. Burrowing owls inhabit open country across much of North America, typically occupying ground squirrel burrows in open, dry grasslands, agricultural and range lands, and other developed/ornamental areas. They often utilize man-made structures and avoid tall, thick vegetation and brush. While the Project site does have disturbed soils and minimal vegetation cover conducive to burrowing owl usage, no burrows or signs of burrowing owls were observed during the field survey. Nevertheless, **Mitigation Measure (MM) BIO-1** would be required to avoid impacts to western burrowing owl prior to commencement of construction.

MM BIO-1 **Burrowing Owl Clearance Survey.** Fourteen days prior to the commencement of Project activities, a qualified biologist will conduct a Presence/Absence survey of suitable habitat on the Project site as well as survey for signs of scat/burrow usage. If burrowing owls/active burrows are directly observed within the Project site during the preconstruction survey, a suitable buffer will be placed around the active burrow as determined by a qualified biologist and avoided until the individuals leave of their own accord. Additionally, if burrowing owl is found during the preconstruction survey, the Project proponent will need to inform the California Department of Fish and Wildlife (CDFW) and the United States Fish and Wildlife Service (USFWS) and prepare a Burrowing Owl Protection and Relocation Plan for approval by these agencies prior to initiating ground disturbance.

There are trees adjacent to and within the Project site and construction activities could result in impacts to nesting bird species. Nesting birds are protected pursuant to the Migratory Bird Treaty Act (MBTA) and the California Fish and Game Code (Sections 3503, 3503.5, 3511, and 3513 prohibit the take, possession, or destruction of birds, their nests or their eggs). To avoid impacts to nesting birds from implementation of the Project, a pre-construction nesting bird survey would be required prior to removal of any landscaped vegetation, as detailed in **MM BIO-2**.

MM BIO-2 **Nesting Bird Clearance Survey.** The Project's construction activities will occur, if feasible, between September 16 and January 31 (outside of nesting bird season) in an effort to avoid impacts to nesting birds. If activities must occur within nesting bird season (February 1 to September 15), a qualified biologist will conduct a pre-construction survey no more than 3 days (72 hours) prior to any construction activities and vegetation removal. Should nesting birds be found, an exclusionary buffer will be established by the qualified biologist. The buffer will be clearly marked in the field by construction personnel under guidance of the qualified biologist. No construction activities will be allowed within this zone until the qualified biologist determines that the young have fledged, or the nest is no longer active.

To the greatest extent feasible, tree trimming/removal activities will be performed outside of the nesting season for birds (February 1–September 15). If trimming or removal of trees during the nesting bird season cannot be avoided, a qualified biologist will monitor tree trimming and removal activities, if nests are found present during the pre-construction survey.

With implementation of **MMs BIO-1 and BIO-2**, the Project would not 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 Wildlife (CDFW) or United States Fish and Wildlife Service (USFWS). Impacts would be less than significant with mitigation incorporated.

b. Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service? ***(No Impact)***

According to the Biological Resources Assessment completed for the Project, there are no riparian habitat areas or other sensitive natural communities present on the Project site. Furthermore, according to CNDDB, there are no recorded observations of natural communities of special concern with potential to occur within the Project site or vicinity. Therefore, the Project would not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFW or USFWS. There would be no impact, and no mitigation is required.

c. Would the project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? ***(No Impact)***

According to the Biological Resources Assessment completed for the Project, no drainage features, ponded areas, wetlands, or riparian habitat subject to jurisdiction of CDFW, United States Army Corps of Engineers (USACE), and/or Regional Water Quality Control Board (RWQCB) are present within the Project site. As such, implementation of the Project would not adversely affect any State or federally protected wetlands, and no impact would occur.

d. Would the project 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? ***(Less Than Significant with Mitigation Incorporated)***

Habitat linkages provide connections between larger habitat areas that are separated by development. Wildlife corridors are similar to linkages but provide specific opportunities for animals to disperse or migrate between areas. A corridor can be defined as a linear landscape feature of sufficient width to allow animal movement between two comparatively undisturbed habitat fragments. Adequate cover is essential for a corridor to function as a wildlife movement area. It is possible for a habitat corridor to be adequate for one species yet still inadequate for others. Wildlife corridors are features that allow for the dispersal, seasonal migration, breeding, and foraging of a variety of wildlife species. Additionally, open space can provide a buffer against both human disturbance and natural fluctuations in resources.

Although there is an undeveloped lot adjacent to the eastern boundary of the Project site, the areas south, west, and north of the Project site are fully developed and provide little to no value to wildlife movement. Furthermore, there are no riparian corridors, creeks, or useful patches of habitat within or connecting the Project site to any identified wildlife corridors or linkages. Because the Project site is surrounded by development and an existing masonry wall, the Project would not substantially limit wildlife movement more than the existing movement limitations in the Project vicinity. Therefore, the Project would not interfere with the movement of any wildlife species or with established wildlife corridors.

While no active nests or birds displaying nesting behavior were observed during the field investigation, the trees adjacent to and within the Project site have the potential to provide minimal foraging and nesting habitat for year-round and seasonal avian residents, as well as migrating songbirds that could occur in the area that are adapted to urban environments. As such, **MM BIO-2** would be required to reduce impacts to nesting birds prior to commencement of construction.

With implementation of **MM BIO-2**, the Project would not interfere 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, and impacts would be less than significant with mitigation incorporated.

e. Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? ***(No Impact)***

The City of Upland Municipal Code Chapter 12.24.100, Tree removal – Permit,[20] requires a permit and approval by the City Manager for the removal of any street trees located between the improved vehicular roadway portion of a public street and the abutting property. Up to two of the existing street trees would be removed to accommodate the driveway off East 20th Street. The Project Applicant would be required to request approval from the City for the removal of any street trees and would follow the requirements of Chapter 12.24.100 of the City's Municipal Code. Therefore, the Project would not conflict with any local policies or ordinances protecting biological resources, and no impact would occur.

f. Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan? ***(No Impact)***

The Project is not subject to any Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan. As a result, no impact would occur.

[20] City of Upland. Code of Ordinances, Title 12 Streets, Sidewalks and Public Places, Chapter 12.24 Parkways, Parking Strips, Section 12.24.100 Tree Removal – Permit.

4.5 CULTURAL RESOURCES

	Potentially Significant Impact	Less Than Significant 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 pursuant to §15064.5?	☐	☒	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐
c) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

The following discussion and analyses are based on the findings included in the *Cultural Resources Assessment*[21] completed for the Project, which is included as **Appendix C** to this IS/MND. The Cultural Resources Assessment included a historical/archaeological resources records search, historical background research, and intensive-level field surveys completed on July 30, 2024, and August 6, 2024.

*a. Would the project cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5? **(Less Than Significant with Mitigation Incorporated)***

The term "historical resource" is defined by Section 15064.5 of the *State CEQA Guidelines* as follows:

> (1) A resource listed in or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources (California Register) (Pub. Res. Code §5024.1, Title 14 California Code of Regulations [CCR], Section 4850 et seq.).
>
> (2) A resource included in a local register of historical resources, as defined in section 5020.1(k) of the Public Resources Code or identified as significant in an historical resource survey meeting the requirements section 5024.1(g) of the Public Resources Code, shall be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.
>
> (3) Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be an historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource shall be considered by the lead agency to be "historically significant" if the resource

[21] LSA. 2024d. *Cultural Resources Assessment, San Antonio Water Company Headquarters Project, City of Upland, San Bernardino County, California.* September.

meets the criteria for listing on the California Register of Historical Resources (Pub. Res. Code, § 5024.1, Title 14 CCR, Section 4852) including the following:

A. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.

B. Is associated with the lives of persons important in our past.

C. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possess high artistic values.

D. Has yielded, or may be likely to yield, information important in prehistory or history.

A "substantial adverse change" to a historical resource, according to PRC Section 5020.1(q), "means demolition, destruction, relocation, or alteration such that the significance of a historical resource would be impaired."

To identify potential historical resources on the Project site, the following tasks were completed: (1) a records search was conducted at the South Central Coastal Information Center (SCCIC) at California State University, Fullerton, on July 11, 2024 and the Sacred Lands File (SLF) from the Native American Heritage Commission (NAHC) on July 8, 2024; (2) archival research including, but not limited to, online sources, published literature in local and regional history, news articles, historic aerial photographs, and historic maps was completed during the months of August and September 2024; and (3) field surveys were conducted on the site on July 8, 2024, and August 6, 2024.

Data from the records search conducted at the SCCIC indicated there have been 11 cultural resource studies previously conducted within 0.5 mile of the Project site, four of which included portions and the entirety of the Project site. Two cultural resources are documented within/partially within the Project site, and 12 others are recorded within 0.5 mile, all of which consist of built environment.

The only historic-period (50 years of age or older) resource that was identified in the Project site is a mostly subterranean, concrete water reservoir that was built in 1930 as part of the irrigation system for nearby citrus groves. The reservoir's primary purpose now is to provide non-potable water to the nearby Holliday Rock Quarry. The reservoir was evaluated for historical significance using the criteria for listing in the California Register of Historical Resources and designation as a City Cultural Resource. It did not meet any of the State or local criteria and therefore is not considered a historical resource pursuant to Section 15064.5 of the *State CEQA Guidelines.*

No archaeological resources are documented within a 0.5 mile of the Project site, and none were identified during the archaeological survey. Despite the lack of surface visibility, the parcel has been severely disturbed and the sensitivity for subsurface resources is low.

Although no archaeological deposits have been recorded at the Project site, there is the potential for previously unknown pre-contact archaeological deposits to be unearthed during construction activities. Should Project excavation unearth intact archaeological deposits, a substantial adverse

change to a historical resource would occur due to the partial or complete destruction of the resource. This destruction would undermine the integrity of the resource, such that it would no longer be eligible for listing in the California Register of Historical Resources. As such, Project ground-disturbing activities could have a substantial adverse change on buried archaeological deposits that qualify as historical resources, as defined in *State CEQA Guidelines* Section 15064.5, and could materially impair pre-contact archaeological deposits. Implementation of **Mitigation Measure (MM) CUL-1** would reduce potential impacts to historic archaeological resources to a less than significant level.

MM CUL-1 **Unknown Archaeological Resources.** In the event that archaeological resources are discovered during excavation, grading, or construction activities, work shall cease within 50 feet of the find until a qualified archaeologist from the San Bernardino County List of Qualified Archaeologists has evaluated the find in accordance with federal, State, and local guidelines to determine whether the find constitutes a "unique archaeological resource," as defined in Section 21083.2(g) of the California Public Resources Code (PRC). Personnel of the Project shall not collect or move any archaeological materials and associated materials. Construction activity may continue unimpeded on other portions of the Project site. The found deposits shall be treated in accordance with federal, State, and local guidelines, including those set forth in PRC Section 21083.2. Prior to issuance of a grading permit, the Director of Planning Services, or designee, shall ensure that this mitigation measure is documented on the grading plans.

b. Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5? ***(Less Than Significant with Mitigation Incorporated)***

In accordance with *State CEQA Guidelines* Section 15064.5(c)), if the project would affect an archaeological deposit, the lead agency must first determine whether the deposit is a "historical resource" (see CEQA Guidelines Section 15064.5(a)). If the deposit is not a historical resource, the lead agency must determine if the deposit is a "unique archaeological resource."

Based on the significance criteria identified above, the Project would have a significant impact on the environment if ground-disturbing activities would cause a substantial adverse change in the significance of a historical or archaeological resource. A substantial adverse change in the significance of an archaeological resource would occur from its demolition, destruction, relocation, or alteration such that the significance of the resource would be materially impaired (CEQA Guidelines Section 15064.5(b)(1)). For the Project, the significance of an archaeological resource would be materially impaired if ground disturbance would alter in an adverse manner those physical characteristics of the resource that convey its historical significance and that justify its eligibility for inclusion in the California Register of Historical Resources. The Project could affect previously unidentified archaeological deposits, thereby causing a substantial adverse change in the significance of an archaeological resource as defined in Section 15064.5. However, potential impacts would be reduced to a less than significant level with implementation of **MM CUL-1**.

c. Would the project disturb any humans remains, including those interred outside of formal cemeteries? ***(Less Than Significant with Mitigation Incorporated)***

Although no human remains are known to be on the Project site or are anticipated to be discovered during Project construction, there is always a possibility of encountering unanticipated cultural resources, including human remains, during construction activities. Disturbing human remains could violate the State's Health and Safety Code as well as destroy the resource. In the event that human remains are discovered during construction activities, the Construction Contractor shall implement **MM CUL-2**, which requires compliance with the State's Health and Safety Code for the treatment of human remains. With implementation of **MM CUL-2**, the Project would have a less than significant with mitigation incorporated.

MM CUL-2 **Human Remains.** If human remains are encountered, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to State Public Resources Code (PRC) Section 5097.98. The County Coroner must be notified of the find immediately. If the remains are determined to be Native American, the County Coroner would notify the Native American Heritage Commission (NAHC), which would determine and notify a Most Likely Descendant (MLD). With the permission of the landowner or his/her authorized representative, the MLD may inspect the site of the discovery. The MLD shall complete the inspection and make recommendations or preferences for treatment within 48 hours of being granted access to the site. The MLD recommendations may include scientific removal and nondestructive analysis of human remains and items associated with Native American burials, preservation of Native American human remains and associated grave goods in place, relinquishment of Native American human remains and associated items to the descendants for treatment, or any other culturally appropriate treatment. Prior to issuance of a grading permit, the Director of Planning Services or designee shall ensure that this mitigation measure is documented on the grading plans.

4.6 ENERGY

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation?	☐	☐	☒	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐

*a. Would the project result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation? **(Less Than Significant Impact)***

Construction Energy Use. Construction of the Project is anticipated to begin in 2025 and be completed by the end of 2026. The Project would include site preparation, grading, building construction, paving, and architectural coating activities during construction.

Construction of the Project would require energy for the manufacture and transport of building materials, preparation of the site for grading activities, and building construction. Petroleum fuels (e.g., diesel and gasoline) would be the primary sources of energy for these activities. Energy usage on the Project site during construction would be temporary in nature and would be relatively small in comparison to the State's available energy sources. Additionally, the Project would be subject to the California Air Resources Board's (CARB) In-Use Off-Road Diesel Vehicle Regulation that applies to certain off-road diesel engines, vehicles, or equipment greater than 25 horsepower. The regulation (1) imposes limits on idling, requires a written idling policy, and requires a disclosure when selling vehicles; (2) requires all vehicles to be reported to CARB (using the Diesel Off-Road Online Reporting System) and labeled; (3) restricts the adding of older vehicles into fleets starting on January 1, 2014; and (4) requires fleets to reduce their emissions by retiring, replacing, or repowering older engines, or installing Verified Diesel Emission Control Strategies (i.e., exhaust retrofits). The fleet must either show that its fleet average index was less than or equal to the calculated fleet average target rate, or that the fleet has met the Best Achievable Control Technology requirements. Therefore, impacts to energy resources during construction would be less than significant, and no mitigation is required.

Operational Energy Use. Typically, the consumption of energy during the operation of a project is associated with natural gas use, energy consumption, and fuel used for vehicle trips. The Project would not increase the demand for natural gas as the Project would be designed to be all-electric and would not include the use of any natural gas systems.

Energy consumption was estimated for the Project using default energy intensities by building type in California Emissions Estimator Model (CalEEMod).[22] Electricity estimates associated with the

[22] LSA. 2024b. *Traffic Impact Analysis San Antonio Water Headquarters Project*. November.

Project are shown in Table 4.6.A. In addition, the Project would result in energy usage associated with gasoline and diesel to fuel Project-related vehicle and truck trips. Based on the CalEEMod analysis, the Project would result in approximately 534,492 vehicle miles traveled (VMT) per year. The average fuel economy for light-duty vehicles (autos, pickups, vans, and SUVs) in the United States has steadily increased from about 14.9 miles per gallon (mpg) in 1980 to 22.9 mpg in 2020.[23] Therefore, using these average fuel economy estimates, the Project would result in the consumption of approximately 23,340 gallons of gasoline per year. Table 4.6.A, below, shows the estimated potential increased electricity and gasoline demand associated with operation of the Project.

Table 4.6.A: Estimated Annual Energy Use of Project

Land Use	Electricity Use (kWh per year)	Gasoline (gallons per year)
Government Office Building	94,277	20,046
Automobile Care Center	90,187	3,294
Parking Lot	45,321	0
Total	**229,785**	**23,340**

Source: Compiled by LSA (September 2024).
kWh = kilowatt-hours

As shown in Table 4.6.A, the estimated potential increased electricity demand associated with operation of the Project is 229,785 kilowatt-hours (kWh) per year. In 2022, California's in-State electric generation totaled 203,257 gigawatt-hours (GWh), and the State's total system electric generation, which includes imported electricity, totaled 287,220 GWh.[24] Therefore, electricity demand associated with the Project would be approximately 0.0001 percent[25] of electricity generated in the State in 2022, which would not represent a substantial demand on available electricity resources. Electrical demand associated with Project operations would be limited to only what is required to efficiently meet the Project's operational needs. In addition, the Project would be designed to the latest mandatory California Green Building Standards Code (CALGreen Code) standards and Title 24 efficiency standards. Additionally, the Project would incorporate sustainability features including a solar cover, which would further reduce the energy demand associated with Project operation. Therefore, the Project's electrical demand would not be considered inefficient, wasteful, or unnecessary.

The Project would also result in energy usage associated with gasoline and diesel to fuel Project-related trips. As shown above in Table 4.6.A, vehicle trips associated with the Project would consume approximately 23,340 gallons of gasoline per year. California is expected to consume approximately 18.5 billion gallons of petroleum per year by 2024 and countywide total petroleum

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23 United States Department of Transportation (USDOT). "Table 4-23: Average Fuel Efficiency of U.S. Light Duty Vehicles." Website: https://www.bts.gov/content/average-fuel-efficiency-us-light-duty-vehicles (accessed September 4, 2024).

24 California Energy Commission (CEC). *2022 Total System Electric Generation*. Website: https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2022-total-system-electric-generation (accessed September 4, 2024).

25 0.229785 GWh (Project) ÷ 203,257 GWh (generated in State in 2022) = 0.0001 percent

use by vehicles is expected to be 1.221 billion gallons per year by 2024.[26] Therefore, the Project would represent approximately 0.002 percent[27] of the County's anticipated petroleum usage in 2024. Therefore, gasoline and diesel demand generated by vehicle and truck trips associated with the Project would be a minimal fraction of gasoline and diesel fuel consumption in California. Therefore, implementation of the Project would not result in a substantial increase in electricity, natural gas, or transportation-related energy, such that it would result in a wasteful, inefficient, or unnecessary consumption of energy resources. Impacts would be less than significant, and no mitigation is required.

*b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency? **(Less Than Significant Impact)***

Less Than Significant Impact. In 2002, the Legislature passed Senate Bill (SB) 1389, which required the California Energy Commission (CEC) to develop an integrated energy plan every 2 years for electricity, natural gas, and transportation fuels for the Integrated Energy Policy Report. The plan calls for the State to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. To further this policy, the plan identifies a number of strategies, including assistance to public agencies and fleet operators in implementing incentive programs for Zero-Emission Vehicles (ZEVs) and their infrastructure needs, and encouragement of urban designs that reduce VMT and accommodate pedestrian and bicycle access.

The CEC's 2023 Integrated Energy Policy Report provides the results of the CEC's assessments of a variety of energy issues facing California. As indicated above, energy usage on the Project site during construction would be temporary in nature and would be relatively small in comparison to the overall use in the State. In addition, energy usage associated with operation of the Project would be relatively small in comparison to the overall use of the State's available energy resources. Therefore, energy impacts at the regional level would be negligible. Because California's energy conservation planning actions are conducted at a regional level, and because the Project's total impact on regional energy supplies would be minor, the Project would not conflict with or obstruct California's energy conservation plans as described in the CEC's Integrated Energy Policy Report. Additionally, as demonstrated above, the Project would not result in the inefficient, wasteful, and unnecessary consumption of energy. Potential impacts related to conflict with or obstruction of a State or local plan for renewable energy or energy efficiency would be less than significant, and no mitigation is required.

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[26] California Air Resources Board (CARB). 2021. EMFAC 2021 Web Database (v1.0.0). June 2021. Website: https://arb.ca.gov/emfac/emissions-inventory (accessed September 4, 2024).

[27] 23,340 gallons (Project) ÷ 1,221,000,000 gallons (State consumption by 2024) = 0.002 percent

4.7 GEOLOGY AND SOILS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i. 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.	☐	☐	☐	☒
ii. Strong seismic ground shaking?	☐	☐	☐	☒
iii. Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv. 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 on- or off-site 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 direct or indirect risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐

The following discussion and analyses are based on the findings included in the Report of Geotechnical Evaluations[28] completed for the Project, which is included as **Appendix D** to this IS/MND.

a. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

*i. 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. **(No Impact)***

Fault rupture is generally expected to occur along active fault traces that have exhibited signs of recent geological movement (i.e., within the last 11,000 years). Alquist-Priolo Earthquake Fault

[28] Soils Southwest, Inc. 2024. *Report of Geotechnical Evaluations and Soils Infiltration Testing for WQMP-BMP Stormwater Disposal Design, Planned New San Antonio Water District Headquarters Office and Maintenance Facility*. August 28.

Zones delineate areas around active faults with potential surface fault rupture hazards that would require specific geological investigations prior to approval of certain kinds of development within the delineated area. There are no mapped faults within or adjacent to the Project site, and the Project site is not located within an Alquist-Priolo Zone.[29] The nearest mapped fault to the Project site is the Cucamonga Fault, which is located approximately 1.3 miles north of the Project site. Therefore, the Project would not directly or indirectly cause substantial adverse effects related to fault rupture, and there would be no impact.

ii. Strong seismic ground shaking? ***(No Impact)***

The Project site is in a seismically active area, where earthquakes have the potential to subject the Project to strong seismic ground shaking. The intensity of ground shaking would depend on the characteristics of the fault, distance from the fault, the earthquake magnitude and duration, and site-specific geologic conditions.

The City requires projects to comply with the 2022 California Building Code (CBC) (Title 24, California Code of Regulations),[30] which provides for stringent construction requirements on projects in areas of high seismic risk based on numerous inter-related factors. It is acknowledged that seismic hazards cannot be completely eliminated, even with implementation of advanced building practices. However, the seismic design standards of the CBC are intended to prevent catastrophic structural failure in the most severe earthquakes currently anticipated. Therefore, the Project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving seismic ground shaking and there would be no impact.

iii. Seismic-related ground failure, including liquefaction? ***(No Impact)***

Liquefaction. Soil liquefaction is a phenomenon primarily associated with saturated soil layers located close to the ground surface. During ground shaking, these soils lose strength and acquire "mobility" sufficient to permit both horizontal and vertical movements. The significant factors on which liquefaction potential of a soil deposit depends, among others include, soil type, relative soil density, intensity of earthquake, duration of ground shaking, and depth of ground water. Soils that are most susceptible to liquefaction are clean, loose, uniformly graded, saturated, fine-grained sands that lie relatively close to the ground surface. However, loose sands that contain a significant amount of fines (i.e., silt and clay) may also liquefy. As detailed in the Report of Geotechnical Evaluations[31] completed for the Project, no groundwater was encountered within the depth of 3 feet explored and available recorded groundwater well data in the Project vicinity indicates historical groundwater measured at approximately 267 feet below ground. Based on the Special Publication 117, published by the State of California Department of Conservation, Division of Mines and Geology, soils are non-susceptible to seismically induced soils in the absence of groundwater

29 California Department of Conservation (DOC) California Geologic Survey (CGS). 2021. *Earthquake Zones of Required Investigation.* Website: https://maps.conservation.ca.gov/cgs/EQZApp/app/ (accessed July 2, 2024).

30 City of Upland. Municipal Code, Title 8, Chapter 15.32.

31 Soils Southwest, Inc. 2024. Op. cit.

within 50 feet below grade. Therefore, the Project site would not be susceptible to liquefaction and no impact would occur.

Lateral Spreading. Lateral spreading is a form of horizontal displacement of soil toward an open channel or other "free" face, such as an excavation boundary. In a lateral spread failure, a layer of ground at the surface is carried on an underlying layer of liquefied material over a nearly flat surface toward a river channel or other bank. The lateral spreading hazard tends to mirror the liquefaction hazard for a site. Because the topography of the site is near level and the Project site is not susceptible to liquefaction, the potential for seismically induced lateral spreading is low. Therefore, the Project site would not be susceptible to lateral spreading and no impact would occur.

iv. Landslides? ***(No Impact)***

A landslide generally occurs on relatively steep slopes and/or on slopes underlain by weak materials. The Project site is relatively level and is not located next to any slopes. The only area within Upland that has been identified as susceptible to slope stability hazards is San Antonio Heights, which is located approximately 0.75 mile north of the Project site and contains slopes that vary between 15 and 20 percent.[32] Therefore, the Project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides and there would be no impact.

b. Would the project result in substantial soil erosion or the loss of topsoil? ***(Less Than Significant Impact)***

Topsoil is defined as the upper part of the soil profile that is relatively rich in humus and is technically known as the A-horizon of the soil profile.[33] Grading and earthmoving during Project construction has the potential to result in erosion and loss of topsoil. Exposed soils could be entrained in stormwater runoff and transported off the Project site. However, this impact would be reduced to a less than significant level through compliance with the preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP), as detailed in Section 4.10, Hydrology and Water Quality. Although designed primarily to protect stormwater quality, the SWPPP would incorporate Best Management Practices (BMPs) to minimize impacts related to erosion to a less than significant level.

c. Would the project 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 on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse? ***(Less Than Significant Impact)***

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32 City of Upland. 2015b. *Final Program Environmental Impact Report General Plan Update (GPU 08-03), Zoning Code Update (ZCU 08-03), Climate Action Plan, and Cable Airport Land Use Compatibility Plan Update SCH No. 2012041006)*. September 28.

33 California State Mining and Geology Board. 2014. Surface Mining Reclamation Act Regulations. California Code of Regulations, Title 14, Division 2, Chapter 8, Subchapter 1.

As discussed in Section 4.7.a, site soils would not be subject to landslides, liquefaction, or lateral spreading.

Subsidence. Subsidence can result from the removal of subsurface water resulting in either gradual depression or catastrophic collapse of the ground surface. As detailed in the Report of Geotechnical Evaluations completed for the Project, no groundwater was encountered within the 3-foot depth explored, and available recorded groundwater well data in the Project vicinity indicate historical groundwater measured at approximately 267 feet below ground. The Project would require excavation to a maximum depth of 6 feet below ground surface. Therefore, it is not anticipated that dewatering or shoring of groundwater would be required during construction. Subsidence would not occur, and there would be no impact.

Unstable Soils and Collapse. As detailed in the Report of Geotechnical Evaluations completed for the Project, upper soils on the Project site are generally, dry, silty, and gravelly, with variable consistency. For adequate structural support, the Report of Geotechnical Evaluations recommends the reworking of load bearing soils in the form of sub excavations, followed by scarification, moisturization, and replacement with engineered fills compacted to minimum 90 percent. Additionally, to minimize potential for differential settlements, the Report of Geotechnical Evaluations recommends that structural footings be established exclusively into engineered fills of local soils, compacted as recommended in the Report of Geotechnical Evaluations. With implementation of the recommendations included in the Report of Geotechnical Evaluations and requirements of the CBC, impacts related to unstable soils and collapse would be less than significant. No mitigation is required.

d. Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property? ***(No Impact)***

Expansive soils are characterized by the potential for shrinking and swelling as the moisture content of the soil decreases and increases, respectively. Shrink-swell potential is influenced by the amount and type of clay minerals present and can be measured by the percent change of the soil volume. As detailed in the Report of Geotechnical Evaluations completed for the Project, soils on-site consist of fine to medium coarse to coarse sands with traces of silts along with rocks and cobbles, which are considered low in expansion potential. Therefore, the Project would not be located on expansive soil, creating substantial direct or indirect risks to life or property, and there would be no impact.

e. Would the project have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water? ***(No Impact)***

Development of the Project would not involve the use of septic tanks or alternative wastewater disposal systems. Therefore, the Project would have no impact related to septic tanks or alternative wastewater disposal systems.

f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? ***(Less Than Significant with Mitigation Incorporated)***

There are no known paleontological resources or unique geologic features within or near the Project site. The City of Upland lies upon a thin blanket of alluvial sediments derived from southbound erosion of the San Bernardino Mountains. Most of these sediments were deposited during the Holocene era (to 10,000 years before the present), and most paleontologists consider Holocene alluvial sediments too young to contain fossils. Deep excavations may expose strata associated with late Pleistocene (10,000 to 120,000 years ago) alluvial deposition. Depending upon its lithology, Pleistocene strata have moderate potential for paleontological resources.[34] Therefore, the possibility of accidental discovery of paleontological resources during Project construction cannot be discounted. Implementation of **Mitigation Measure (MM) GEO-1**, described below, would reduce potential impacts to paleontological resources to a less than significant level.

MM GEO-1 **Paleontological Resources Impact Mitigation Program.** Should paleontological resources be encountered during Project subsurface construction activities, all ground-disturbing activities within 25 feet shall be redirected and a qualified paleontologist contacted to assess the situation, consult with agencies as appropriate, and make recommendations for the treatment of the discovery. For purposes of this mitigation, a "qualified paleontologist" shall be an individual with the following qualifications: (1) a graduate degree in paleontology or geology and/or a person with a demonstrated publication record in peer-reviewed paleontological journals; (2) at least two years of professional experience related to paleontology; (3) proficiency in recognizing fossils in the field and determining their significance; (4) expertise in local geology, stratigraphy, and biostratigraphy; and (5) experience collecting vertebrate fossils in the field. If the paleontological resources are found to be significant and Project activities cannot avoid them, measures shall be implemented to ensure that the Project does not cause a substantial adverse change in the significance of the paleontological resource. Measures may include monitoring, recording the fossil locality, data recovery and analysis, a final report, and accessioning the fossil material and technical report to a paleontological repository. Upon completion of the assessment, a report documenting methods, findings, and recommendations shall be prepared and submitted to the City of Upland for review. If paleontological materials are recovered, this report also shall be submitted to a paleontological repository such as the University of California Museum of Paleontology, along with significant paleontological materials. Public educational outreach may also be appropriate.

[34] City of Upland. 2015a. *Final Program Environmental Impact Report General Plan Update (GPU 08-03), Zoning Code Update (ZCU 08-03), Climate Action Plan, and Cable Airport Land Use Compatibility Plan Update SCH No. 2012041006)*. September 28.

4.8 GREENHOUSE GAS EMISSIONS

	Potentially Significant Impact	Less Than Significant 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?	☐	☐	☒	☐

The following discussion and analyses are based on the findings included in the Air Quality and Greenhouse Gas Technical Memorandum[35] completed for the Project, which is included as **Appendix A** to this IS/MND.

*a. Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? **(Less Than Significant Impact)***

This section describes the Project's construction- and operation-related greenhouse gas (GHG) emissions and contribution to global climate change. The South Coast Air Quality Management District (SCAQMD) has not addressed emission thresholds for construction in its *CEQA Air Quality Handbook*; however, SCAQMD requires quantification and disclosure. Thus, this section discusses construction emissions.

Construction Greenhouse Gas Emissions. Construction activities associated with the Project would produce combustion emissions from various sources. Construction would emit GHGs through the operation of construction equipment and from worker and builder supply vendor vehicles for the duration of the approximately 15-month construction period. The combustion of fossil-based fuels creates GHGs such as carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Furthermore, the fueling of heavy equipment emits CH_4. Exhaust emissions from on-site construction activities would vary daily as construction activity levels change.

As indicated above, SCAQMD does not have an adopted threshold of significance for construction-related GHG emissions. However, lead agencies are required to quantify and disclose GHG emissions that would occur during construction. The SCAQMD then requires the construction GHG emissions to be amortized over the life of the project (which is defined as 30 years), added to the operational emissions, and compared to the applicable interim GHG significance threshold tier. Based on California Emissions Estimator Model (CalEEMod), it is estimated that the Project would generate 396 metric tons of carbon dioxide equivalent (MT CO_2e) during construction of the Project. When amortized over the 30-year life of the Project, annual emissions would be 13 MT CO_2e.

[35] LSA. 2024a. *Air Quality and Greenhouse Gas Technical Memorandum for the Proposed San Antonio Water Headquarters in Upland, California (LSA Project No. 20241723)*. November 19.

Operational Greenhouse Gas Emissions. Long-term GHG emissions are typically generated from mobile sources (e.g., cars, trucks, and buses), area sources (e.g., maintenance activities and landscaping), indirect emissions from sources associated with energy consumption, and refrigerant fugitive emissions.

GHG emissions were estimated using CalEEMod. Table 4.8.A shows the estimated operational GHG emissions for the Project. Motor vehicle emissions are the largest source of GHG emissions for the Project, at approximately 49 percent of the Project total. Refrigerant sources are the next largest category, at approximately 35 percent. Energy, water, and waste sources represent approximately 14 percent, 1 percent, and 2 percent of the total emissions, respectively. Area sources make up less than 1 percent of the total emissions.

Table 4.8.A: Greenhouse Gas Emissions

Emission Type	Operational Emissions (MT/yr)					
	CO_2	CH_4	N_2O	Refrigerant	CO_2e	Percentage of Total
Mobile Source	190	<0.1	<0.1	—	193	49
Area Source	<1	<0.1	<0.1	—	<1	<1
Energy Source	55	<0.1	<0.1	—	56	14
Water Source	3	<0.1	<0.1	—	4	1
Waste Source	2	<0.1	<0.1	—	6	2
Refrigerant Source	—	—	—	140	140	35
Total Operational Emissions						**399**
Amortized Construction Emissions						13
Total Annual Emissions						**412**
SCAQMD Threshold						**3,000**
Exceedance?						**No**

Source: Compiled by LSA (November 2024).
Note: Figures may not appear to add correctly due to rounding.
CH_4 = methane
CO_2 = carbon dioxide
CO_2e = carbon dioxide equivalent
MT/yr = metric tons per year
N_2O = nitrous oxide
SCAQMD = South Coast Air Quality Management District

As discussed above, a project would have less than significant GHG emissions if it would result in operational-related GHG emissions of less than 3,000 MT CO_2e per year. Based on the analysis results, the Project would result in approximately 412 MT CO_2e per year, which would not exceed the SCAQMD threshold of 3,000 MT CO_2e per year. Therefore, Project-level and cumulative GHG emissions would be less than significant, and operation of the Project would not generate GHG emissions that would have a significant effect on the environment. Impacts would be less than significant, and no mitigation is required.

b. Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases? ***(Less Than Significant Impact)***

The following discussion evaluates the Project according to the goals of the 2022 Scoping Plan and Southern California Association of Governments' (SCAG) 2020–2045 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS).

2022 Scoping Plan. Executive Order (EO) B-30-15 added the immediate target of reducing GHG emissions to 40 percent below 1990 levels by 2030. Senate Bill (SB) 32 affirms the importance of addressing climate change by codifying into statute the GHG emissions reduction target of at least 40 percent below 1990 levels by 2030 contained in EO B-30-15. CARB released the 2017 Scoping Plan to reflect the 2030 target set by EO B-30-15 and codified by SB 32.[36] SB 32 builds on Assembly Bill (AB) 32 and keeps California on the path toward achieving the State's 2050 objective of reducing emissions to 80 percent below 1990 levels. AB 197, the companion bill to SB 32, provides additional direction to CARB that is related to the adoption of strategies to reduce GHG emissions. Additional direction in AB 197 that is intended to provide easier public access to air emission data collected by CARB was posted in December 2016. AB 1279 codifies the State goals of achieving net carbon neutrality by 2045 and maintaining net negative GHG emissions thereafter.

In addition, the 2022 Scoping Plan[37] assesses progress toward the statutory 2030 target while laying out a path to achieving carbon neutrality no later than 2045. The 2022 Scoping Plan focuses on outcomes needed to achieve carbon neutrality by assessing paths for clean technology, energy deployment, natural and working lands, and others, and is designed to meet the State's long-term climate objectives and support a range of economic, environmental, energy security, environmental justice, and public health priorities.

The 2022 Scoping Plan focuses on building clean energy production and distribution infrastructure for a carbon-neutral future, including transitioning existing energy production and transmission infrastructure to produce zero-carbon electricity and hydrogen, and utilizing biogas resulting from wildfire management or landfill and dairy operations, among other substitutes. The 2022 Scoping Plan states that in almost all sectors, electrification will play an important role. The 2022 Scoping Plan evaluates clean energy and technology options and the transition away from fossil fuels, including adding four times the solar and wind capacity by 2045 and about 1,700 times the amount of current hydrogen supply. As discussed in the 2022 Scoping Plan, EO N-79-20 requires that all new passenger vehicles sold in California be zero-emission by 2035 and that all other fleets transition to zero-emission as fully as possible by 2045, which will reduce the percentage of fossil fuel combustion vehicles.

- **Energy-efficient measures** are intended to maximize energy efficiency building and appliance standards, pursue additional efficiency efforts including new technologies and new policy and implementation mechanisms, and pursue comparable investment in energy efficiency from all retail providers of electricity in California. In addition, these measures are designed to expand the use of green building practices to reduce the carbon footprint of California's new and existing inventory of buildings. The Project would develop an existing undeveloped portion of SAWCo land into new SAWCo headquarters. As mentioned above, the Project would not be powered by natural gas, and no natural gas would be used during construction or operation of the Project. The elimination of natural gas in new development would help projects implement their "fair share" of achieving long-term 2045 carbon neutrality consistent with State goals. As such, if a project does not use natural gas, a lead agency can conclude that it would be

36 CARB. 2022. *2022 Scoping Plan for Achieving Carbon Neutrality.* December. Website: ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf (accessed November 2024).

37 CARB. 2017. *California's 2017 Climate Change Scoping Plan*. November.

consistent with achieving the 2045 neutrality goal and will not have a cumulative considerable impact on climate change. The Project does not include natural gas. In addition, the Project would comply with the latest Title 24 standards regarding energy conservation and green building standards. Therefore, the Project would comply with applicable energy measures.

- **Water conservation and efficiency measures** are intended to continue efficiency programs and use cleaner energy sources to move and treat water. Increasing the efficiency of water transport and reducing water use would reduce GHG emissions. As noted above, the Project would be required to comply with the latest Title 24 standards, which include a variety of different measures, including reduction of wastewater and water use. The Project would also include low water landscape in their design. In addition, the Project would be required to comply with the California Model Water Efficient Landscape Ordinance. Therefore, the Project would not conflict with any of the water conservation and efficiency measures.

- The goal of **transportation and motor vehicle measures** is to develop regional GHG emissions reduction targets for passenger vehicles. Specific regional emission targets for transportation emissions would not directly apply to the Project. However, vehicles traveling to the Project site would comply with the Pavley II (LEV III) Advanced Clean Cars Program. The second phase of Pavley standards reduces GHG emissions from new cars by 34 percent from 2016 levels by 2025, resulted in a 3 percent decrease in average vehicle emissions for all vehicles as of 2020. Therefore, the Project would not conflict with the identified transportation and motor vehicle measures.

The Project would comply with existing State regulations adopted to achieve the overall GHG emission reduction goals identified in the 2022 Scoping Plan, EO B-30-15, SB 32, AB 197, and AB 1279.

SCAG's Regional Transportation Plan/Sustainable Communities Strategy. SCAG's 2024–2050 RTP/SCS[38] identifies land use strategies that focus on new housing and job growth in areas served by high-quality transit, and other opportunity areas would be consistent with a land use development pattern that supports and complements the proposed transportation network. The core vision in the 2024–2050 RTP/SCS is to better manage the existing transportation system through design management strategies, integrate land use decisions and technological advancements, create complete streets that are safe for all roadway users, preserve the transportation system, and expand transit and foster development in transit-oriented communities. The 2024–2050 RTP/SCS contains transportation projects to help more efficiently distribute population, housing, and employment growth, as well as providing a forecast development pattern that is generally consistent with regional-level General Plan data. The forecast development pattern, when integrated with the financially constrained transportation investments identified in the 2024–2050 RTP/SCS, would reach the regional target of reducing GHG emissions from automobiles and light-duty trucks by 8 percent by 2020 and 19 percent by 2035 (compared to 2005 levels per capita

[38] Southern California Association of Governments (SCAG). 2020. *Connect SoCal: The 2020–2045 Regional Transportation Plan/Sustainable Communities Strategy of the Southern California Association of Governments*. Website: scag.ca.gov/sites/main/files/file-attachments/0903fconnectsocal-plan_0.pdf?1606001176 (accessed November 2024).

emission levels). The 2024–2050 RTP/SCS does not require that local General Plans, Specific Plans, or zoning be consistent with the 2024–2050 RTP/SCS, but it provides incentives for consistency for governments and developers.

Implementing SCAG's RTP/SCS will greatly reduce the regional GHG emissions from transportation, helping to achieve statewide emissions reduction targets. As demonstrated in Section 4.3.1 of the Air Quality section, the Project does not meet the criteria identified in *State CEQA Guidelines* Section 15205.b.2 (Projects of Statewide, Regional, or Areawide Significance) for projects of statewide, regional, or areawide significance. In addition, while the Project would require a change to the General Plan land use designation and the current zoning, the City of Upland plans to update both the General Plan and zoning to accommodate the Project. As demonstrated in Table 4.8.A, the Project would not generate significant levels of GHGs, thus would not interfere with SCAG's ability to achieve the region's GHG reduction target of 19 percent below 2005 per capita emissions levels by 2035. Furthermore, the Project is not regionally significant per *State CEQA Guidelines* Section 15206, and, as such, it would not conflict with the SCAG RTP/SCS targets since those targets were established and are applicable on a regional level. Impacts would be less than significant, and no mitigation is required.

4.9 HAZARDS AND HAZARDOUS MATERIALS

	Potentially Significant Impact	Less Than Significant 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 handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which 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) For a project located 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 or excessive noise for people residing or working in the project area?	☐	☐	☐	☒
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☐	☒

a. Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? ***(Less Than Significant Impact)***

The Project involves the construction of a new 3,698-square-foot SAWCo headquarters and associated improvements including a 4,066-square-foot maintenance building, maintenance yard, driveway, parking, solar cover, landscaping, and utility improvements. Hazardous materials that are currently stored on the site in reportable quantities include diesel fuel in quantities of 120 to 599 gallons.[39] Operation of the Project involves routine transport, use, and/or disposal of hazardous materials. Hazardous materials (e.g., oil, grease, fuels, paint) would be transported and used on-site during construction activities. The routine transport, use, or disposal of these hazardous materials could pose a potential hazard to construction workers and future employees working at the Project site as they would be handling the hazardous materials and could therefore be exposed through inhalation of vapors, direct contact with skin, or accidental ingestion. The routine transport, use, or disposal of these hazardous materials would not pose a significant hazard to the public or

[39] California Department of Toxic Substances Control (DTSC). 2021. *Facilities from the California Environmental Reporting Systems (CERS).* Website: https://siteportal.calepa.ca.gov/nsite/site/427484 (accessed July 2, 2024).

environment unless the hazardous materials were accidentally spilled or released into the environment, as discussed in Section 4.9.b below.

The Project site would be subject to existing regulatory programs for hazardous materials. The San Bernardino County Fire Protection District (SBCFPD) Hazardous Materials Division is designated as the Certified Unified Program Agency (CUPA) for the City of Upland, and coordinates the regulation of hazardous materials and hazardous wastes in the City of Upland through the following programs:

- Hazardous Materials Business Plan
- Hazardous Waste & Onsite Treatment
- Aboveground Petroleum Storage Act (APSA)
- Underground Storage Tank (UST) Program
- California Accidental Release Program (CalARP)
- Uniform Fire Code Hazardous Material Management Plans and Inventories

The role of a CUPA is to consolidate, coordinate, and make consistent the administrative requirements, permits, inspections, and enforcement activities associated with the regulation of hazardous materials and hazardous wastes. Businesses that store or use hazardous materials in the City limits of Upland are required to submit chemical and facility information on the California Environmental Reporting Systems (CERS), which is a statewide web-based system to support CUPAs in electronically collecting and reporting various hazardous materials-related data as mandated by the California Health and Safety Code and 2008 legislation (Assembly Bill [AB] 2286). Chapter 6.95 of Division 20 of the California Health and Safety Code requires that an Hazardous Materials Business Plan (HMBP) must be submitted to the local CUPA if on-site hazardous materials exceed in aggregate any of the following: 55 gallons for liquids; 500 pounds for solids; or 200 cubic feet of gases at standard temperature and pressure. HMBPs are required to be submitted electronically to the CERS and must include facility information, a Hazardous Materials Inventory Statement, an Emergency Response Plan, and an Emergency Response Training Plan. The HMBP has to be re-certified for completeness and accuracy every year, or updated and revised, as necessary.

Worker health and safety is regulated at the federal level by the United States Department of Labor, Occupational Safety and Health Administration (OSHA). OSHA regulations include training requirements for construction workers and a requirement that hazardous materials are accompanied by manufacturer's Safety Data Sheets (SDSs). The Federal Occupational Safety and Health Act of 1970 authorizes states to establish their own safety and health programs with OSHA approval. Worker health and safety protections in California are regulated by the California Department of Industrial Relations (DIR). The DIR includes the Division of Occupational Safety and Health (DOSH), which acts to protect workers from safety hazards through its California OSHA (Cal/OSHA) program. Cal/OSHA regulations include requirements for protective clothing, training, and limits on exposure to hazardous materials. California standards for workers dealing with hazardous materials are contained in California Code of Regulations (CCR) Title 8 and include practices for all industries (General Industrial Safety Orders), and specific practices for construction, and other industries. The routine transport, use, and disposal of hazardous materials at the Project site during operation and construction activities would be required to comply with a Project Health and Safety Plan (HASP) prepared in accordance with CCR Title 8, which would mitigate potential

health hazards for workers related to the routine transport, use, or disposal of hazardous materials to a less than significant level.

As detailed in Section 4.10, Hydrology and Water Quality, because the Project would result in soil disturbance greater than 1 acre, management of hazardous materials during construction activities would be subject to the requirements of the Stormwater Construction General Permit (CGP), which requires preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP) that includes hazardous materials storage requirements. For example, construction site operators must store chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).

The transportation of hazardous materials is subject to United States Department of Transportation (USDOT), Resource Conservation and Recovery Act (RCRA), and State regulations. In 1990 and 1994, the federal Hazardous Material Transportation Act was amended to improve the protection of life, property, and the environment from the inherent risks of transporting hazardous material in all major modes of commerce. The USDOT developed hazardous materials regulations, which govern the classification, packaging, communication, transportation, and handling of hazardous materials, as well as employee training and incident reporting. The California Highway Patrol, the California Department of Transportation (Caltrans), and the California Environmental Protection Agency (Cal/EPA) Department of Toxic Substances Control (DTSC) are responsible for enforcing federal and State regulations pertaining to the transportation of hazardous materials.

Construction of the Project would result in the generation of various waste materials that would require recycling and/or disposal, including some waste materials that may be classified as hazardous waste. Hazardous wastes would be required to be transported by a licensed hazardous waste hauler and disposed of at facilities that are permitted to accept such materials as required by USDOT, RCRA, and State regulations.

Compliance with the existing hazardous materials regulations and programs described above, including requirements for HMBPs and Risk Management Plans (RMPs) for facilities handling significant quantities of hazardous materials, OSHA and Cal/OSHA regulations, CCR Title 8; the CGP; and USDOT, RCRA, and State regulations, would ensure that the Project would not create a significant hazard to the public or the environment associated with the routine transport, use, or disposal of hazardous materials by ensuring that these materials are properly handled during construction and operation of the Project and therefore, would be considered less than significant.

b. Would the project 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)***

There are two main ways that the public and/or the environment could be affected by the release of hazardous materials from the Project site, including: (1) exposing workers and/or the public to potentially contaminated soil and groundwater during construction and/or operation of the Project; or (2) exposing workers and/or the public to hazardous building materials (e.g., lead paint, asbestos) during demolition of existing structures.

As described above, diesel fuel in quantities of 120 to 599 gallons and small quantities of other common hazardous materials would be used at the Project site during construction and operation of the Project. Improper use, storage, or handling could result in a release of hazardous materials into the environment which could pose a risk to construction workers and the public. However, the Project Applicant would be required to comply with existing government regulations related to the use and disposal of these materials as detailed previously in Section 4.9.a, and such materials would not be used in sufficient strength or quantity to create a substantial risk to human or environmental health.

The Project would not involve the demolition of any existing structures. The portion of the Project site proposed for development is primarily vacant land that is surrounded by a mix of residential, commercial, and industrial uses. According to the State Water Board's GeoTracker database, there are no documented past releases of hazardous materials in the nearby vicinity of the Project site.[40] Based on the observed uses of the properties located immediately adjoining the Project site, it is unlikely that the soil and groundwater are contaminated with significant toxic or hazardous materials that would be released during construction. Additionally, compliance with the regulations described previously in Section 4.9.a would ensure that the Project would not create a significant hazard to the public or the environment through accident conditions involving the release of hazardous materials into the environment during the transport, use, or disposal of hazardous materials by ensuring that these materials are properly handled during construction of the Project. Therefore, this impact would be less than significant.

c. Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? ***(No Impact)***

There are no existing or proposed schools within 0.25 mile of the Project site. The closest school to the Project site is the Grace Lutheran Preschool, located approximately 0.35 mile northwest of the Project site. Additionally, as noted in Section 4.9.a, development of the Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials and, as noted in Section 4.9.b, construction activities would not create a hazard to the public and environment through reasonably foreseeable upset and accident conditions. Therefore, there would be no impact.

d. Would the project be located on a site which 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? ***(No Impact)***

The Project site is not included on any list of hazardous materials site compiled pursuant to Government Code Section 65962.5,[41] and no impact would occur.

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40 State Water Resources Control Board (SWRCB). 2024. *GeoTracker.* Website: https://geotracker.waterboards.ca.gov/m))ap/?myaddress=California&from=header&cqid=4806317985 (accessed July 2, 2024).

41 California Environmental Protection Agency (CalEPA). 2024. *Cortese List Data Resources*. Website: https://calepa.ca.gov/sitecleanup/corteselist/ (accessed July 2, 2024).

e. Would the project be located 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 or excessive noise for people residing or working in the project area? ***(No Impact)***

The Project site is located approximately 2.2 miles northeast of the Cable Airport and is not located within the airport's Land Use Compatibility Plan.[42] As such, implementation of the Project would not result in a safety hazard or excessive noise for people residing or working in the Project area in association with airports. No impact would occur.

f. Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? ***(Less Than Significant Impact)***

The improvements that would occur as part of the Project are site-specific and do not include any public right-of-way improvements to off-site areas (e.g., roadway improvements, intersection improvements). The Project would not reduce the number of traffic lanes on any adjacent streets and would not alter the existing street grid, and; therefore, it would not alter or obstruct emergency evacuation routes or response plan. The Project site would be accessible to emergency vehicles in the event a hazardous event occurs on the site. Overall, the Project does not include any features that would impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; therefore, this impact would be less than significant.

g. Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires? ***(No Impact)***

The Project site is located in an urban area and is not within or adjacent to a wildland fire hazard area or high fire hazard severity zone.[43] Therefore, the Project would not expose people or structures to a significant loss, injury, or death involving wildland fires, and there would be no impact.

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42 City of Upland. 2015c. *Cable Airport Land Use Compatibility Plan. Map 3A Compatibility Policy Map.* September 14.

43 Office of the State Fire Marshal. 2024. *2024 Fire Hazard Severity Zones.* Website: https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/fire-hazard-severity-zones (accessed April 22, 2025).

4.10 HYDROLOGY AND WATER QUALITY

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	☐	☐	☒	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:	☐	☐	☒	☐
i. Result in substantial erosion or siltation on- or off-site;	☐	☐	☒	☐
ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	☒	☐
iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☒	☐
iv. Impede or redirect flood flows?	☐	☐	☐	☒
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☒
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐

The following discussion and analyses are based on the findings included in Preliminary Water Quality Management Plan[44] completed for the Project, which is included as **Appendix E** to this IS/MND.

*a. Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality? **(Less Than Significant Impact)***

The State Water Resources Control Board (SWRCB) and nine Regional Water Quality Control Boards (RWQCBs) regulate the quality of surface water and groundwater bodies throughout California. In Upland, the Santa Ana RWQCB (SARWQCB) is responsible for implementation of the Water Quality Control Plan (Basin Plan). The Basin Plan establishes beneficial water uses and water quality objectives for waterways and water bodies within the region. Section 303(d) of the federal Clean Water Act (CWA) requires that states identify water bodies, including bays, rivers, streams, creeks, and coastal areas, that do not meet water quality standards and the pollutants that are causing the impairment. Total Maximum Daily Loads (TMDLs) describe the maximum amount of a pollutant that

[44] Land Development Design Company, LLC. 2024. *Preliminary Water Quality Management Plan For: San Antonio Water Company.* September 7.

a water body can receive while still meeting established water quality standards. A TMDL establishes limits for pollutant discharges into impaired water bodies.

As discussed in Chapter 2.0, Project Description, the Project site is undeveloped and does not contain any existing stormwater infrastructure. Stormwater flows to the southwest to a natural ravine which discharges into an existing ditch along the freeway right-of-way which discharges to a City of Fontana storm drain along Poplar Avenue. Receiving waters include the San Sevaine Channel, which flows to the Santa Ana River Reach 3, which drains to the Prado Dam. Prado Dam drains to Santa Ana River Reach 2, which flows to Santa Ana River Reach 1, which discharges to the Pacific Ocean. The receiving waters for stormwater runoff from the Project site are listed as impaired on the 303(d) list for several constituents.[45] The San Seavine Channel does not have any listed impairments. The Santa Ana River Reach 3 is listed as an impaired water body for the following pollutants: copper, indicator bacteria, and lead. Prado Basin is listed as impaired for pH, and Santa Ana River Reach 2 and Santa Ana River Reach 1 do not have any listed impairments.

Runoff water quality is regulated by the National Pollutant Discharge Elimination System (NPDES) Program (established through the federal CWA). The NPDES program objective is to control and reduce pollutant discharges to surface water bodies. Compliance with NPDES permits is mandated by State and federal statutes and regulations. Locally, the NPDES Program is administered by the SARWQCB. Construction activities are subject to the SWRCB NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities, Order No. 2022-0057-DWQ, NPDES No. CAS000002 (Construction General Permit [CGP]). Any construction activity, including grading, that would result in the disturbance of 1 acre or more would require compliance with SWRCB's CGP, which requires preparation of a SWPPP and implementation of Construction Best Management Practices (BMPs) during construction activities. Construction BMPs would include, but not be limited to, Erosion Control and Sediment Control BMPs designed to minimize erosion and retain sediment on site as well as Good Housekeeping BMPs to prevent spills, leaks, and discharge of construction debris and waste into receiving waters.

Project operations are subject to the NPDES Permit and Waste Discharge Requirements for the San Bernardino County Flood Control District, the County of San Bernardino, and the Incorporated Cities of San Bernardino County within the Santa Ana Region, Order No. R8-2010-0036, NPDES No. CAS618036 (MS4 Permit). Any "Significant Redevelopment" projects that add or replace 5,000 square feet or more of impervious surface on an already developed site or "New Development" projects that create 10,000 square feet or more of impervious surface must comply with the requirements of the MS4 Permit. The MS4 permit prohibits discharges, sets limits on pollutants being discharged into receiving waters, and requires implementation of technology-based standards. The MS4 Permit requires co-permittees to develop and implement standard design and post-development BMP guidance to guide application of Low Impact Development (LID) BMPs to the maximum extent practicable. The MS4 Permit requires that a Final Water Quality Management Plan (WQMP) be prepared for new development and significant redevelopment projects within its

[45] State Water Resources Control Board (SWRCB). 2023. *2020-2022 California Integrated Report (Clean Water Act Section 303(d) List and 305(b) Report)*. Website: https://www.waterboards.ca.gov/water_issues/programs/water_quality_assessment/2020_2022_integrated_report.html (accessed September 17, 2024).

jurisdiction. In addition, the NPDES permit includes hydromodification requirements that projects must include management techniques to reduce the potential for impacts, such as a change in runoff and sediment yield because of land use modifications. To address hydromodification requirements with the County of San Bernardino, the Santa Ana RWQCB developed a Technical Guidance Document for Water Quality Management Plans.[46]

The Final WQMP would specify the Site Design, Source Control, LID, and Treatment Control BMPs that would be implemented to capture, treat, and reduce pollutants of concern in storm water runoff. Design BMPs are storm water management strategies that emphasize conservation and use of existing site features to reduce the amount of runoff and pollutant loading generated from a site. Source Control BMPs are preventative measures that are implemented to prevent the introduction of pollutants into storm water. LID BMPs mimic a project site's natural hydrology by using design measures that capture, filter, store, evaporate, detain, and infiltrate runoff rather than allowing runoff to flow directly to piped or impervious storm drains. Treatment Control BMPs are structural BMPs designed to treat and reduce pollutants in storm water runoff prior to releasing it to receiving waters.

Construction. The Project involves the construction of a new 3,698-square-foot SAWCo headquarters and associated improvements including a 4,066-square-foot maintenance building, maintenance yard, driveway, parking, solar cover, landscaping, and utility improvements. Construction activities would result in the disturbance of 2.8 acres of soil. Pollutants of concern during construction include sediments, trash, petroleum products, concrete waste (dry and wet), sanitary waste, and chemicals. Each of these pollutants on its own or in combination with other pollutants can have a detrimental effect on water quality. During construction activities, excavated soil would be exposed, and there would be an increased potential for soil erosion and sedimentation compared to existing conditions. In addition, chemicals, liquid products, petroleum products (e.g., paints, solvents, and fuels), and concrete-related waste may be spilled or leaked, and they have the potential to be transported via storm water runoff into receiving waters.

Because construction of the Project would disturb greater than 1 acre of soil, the Project is subject to the requirements of the CGP, which requires preparation of an SWPPP and implementation of construction BMPs during construction activities. Construction BMPs would include, but are not limited to, Erosion Control and Sediment Control BMPs designed to minimize erosion and retain sediment on site as well as Good Housekeeping BMPs to prevent spills, leaks, and discharge of construction debris and waste into receiving waters.

As detailed in the Report of Geotechnical Evaluations[47] completed for the Project, no groundwater was encountered within the depth of 3 feet explored and available recorded groundwater well data in the Project vicinity indicates historical groundwater measured at approximately 267 feet below ground. The Project would require excavation to a maximum depth of 6 feet below ground surface. Therefore, it is not anticipated that dewatering or shoring of groundwater would be required during construction.

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46 CDM Smith Inc. 2013. *Technical Guidance Document Water Quality Management Plans.* June 21.

47 Soils Southwest, Inc. 2024. Op. cit.

Adherence with the CGP, including implementation of the required SWPPP and Construction BMPS, would ensure construction impacts related to surface water quality standards, waste discharge requirements, and surface water quality would be less than significant.

Operation. Pollutants of concern from long-term operations include suspended solids/sediment, nutrients, oil and grease, metals, and trash and debris. The Project would include an infiltration basin and an underground storage infiltration system that would be used for stormwater control, treatment, and infiltration. The Project would also be required to prepare a Final WQMP, consistent with the requirement of the City's MS4 permit, because the Project consists of significant new development that would create 10,000 square feet or more of impervious surface. The Final WQMP would specify the Site Design, Source Control, LID, and Treatment Control BMPs that would be implemented to capture, treat, and reduce pollutants of concern in storm water runoff. Therefore, compliance with the requirements of the City and the MS4 Permit would ensure that operation impacts to water quality would be less than significant.

Overall, because the Project would be required to comply with existing regulations (including the CGP and the MS4 Permit), the Project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality. Impacts would be less than significant and no mitigation is required.

b. Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin? ***(Less Than Significant Impact)***

The Project site lies within the Upper Santa Ana Valley – Chino Groundwater Basin.[48] The basin has a surface area of approximately 154,000 acres (240 square miles) and is located in southwestern San Bernardino County. The basin is bounded by the Rialto-Colton fault to the east, impermeable rocks forming the Jurupa Mountains to the southeast, impermeable rocks of the Puente Hills and the Chino Fault to the south, the San Jose Fault on the northwest, and impermeable rocks of the San Gabriel Mountains and the Cucamonga Fault to the north. The water-bearing units in the Chino Subbasin include Holocene and Upper Pleistocene alluvium. Recharge to the basin occurs by direct infiltration or precipitation on the subbasin floor, by infiltration of surface flow, and by underflow of ground water from adjacent basins. There are five recharge facilities in the subbasin including Deer Creek, Day Creek, East Etiwanda, San Sevaine, and Victoria. Groundwater levels declined about 80 feet from historical high marks in the 1920s by 1980. By 2000, water levels had recovered about 20 feet. Total storage within the subbasin is approximately 18,300,000 acre-feet and, as of 2000, total storage is estimated to have been 5,325,000 acre-feet.[49]

Construction. As detailed in the Report of Geotechnical Evaluations[50] completed for the Project, no groundwater was encountered within the depth of 3 feet explored and available recorded

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48 California Department of Water Resources (DWR). n.d. *Groundwater Basin Boundary Assessment Tool.* Website: https://gis.water.ca.gov/app/bbat/ (accessed July 3, 2024).

49 California Department of Water Resources (DWR). Division of Water Rights. 2006. *Upper Santa Ana Valley Groundwater Basin, Chino Subbasin, California's Groundwater Bulletin 118.* January 20.

50 Soils Southwest, Inc. 2024. Op. cit.

groundwater well data in the Project vicinity indicates historical groundwater measured at approximately 267 feet below ground. The Project would require excavation to a maximum depth of 6 feet below ground surface. Therefore, it is not anticipated that dewatering or shoring of groundwater would be required during construction, and construction activities associated with the Project would not contribute to a substantial depletion of groundwater supplies.

Operation. Development of the Project would increase impervious surface area by approximately 1.1 acres, which would decrease on-site infiltration. As described above, the Project includes BMPs to collect and infiltrate stormwater at the Project site in accordance with the MS4 Permit. Therefore, development of the Project would not substantially decrease the amount of stormwater that infiltrates as compared to the existing conditions.

Water service for the Project would be provided by the City of Upland. The City's water supplies include imported water from the Metropolitan Water District of Southern California (MWD) purchased through Inland Empire Utilities Agency (IEUA), groundwater pumped from City owned wells and West End Consolidated Water Company (WECWC), groundwater purchased from SAWCo, surface water purchased from SAWCo and treated by the City, and recycled water purchased from IEUA. Therefore, operation of the Project would likely involve the use of both surface and groundwater sources for potable water. The 2020 Urban Water Management Plan indicates the City has sufficient water supplies to meet water demands through 2045, including during multiple dry years.[51] Therefore, the Project's water needs would not contribute to a substantial depletion of groundwater supplies.

For the reasons listed above, impacts related to the decrease of groundwater supplies or interference with groundwater recharge would be less than significant, and no mitigation is required.

c. Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

i. Result in substantial erosion or siltation on- or off-site; ***(Less Than Significant Impact)***

As previously discussed, the Project site is undeveloped and does not contain any existing stormwater infrastructure. Stormwater flows to the southwest to a natural ravine which discharges into an existing ditch along the freeway right-of-way which discharges to a City of Fontana storm drain along Poplar Avenue. During construction activities, more than 1 acre of soil would be disturbed. Soil would be exposed, and drainage patterns temporarily altered during grading and other construction activities, and there would be an increased potential for soil erosion and siltation compared to existing conditions. Additionally, during a storm event, soil erosion and siltation could occur at an accelerated rate. The CGP requires the preparation of an SWPPP to identify construction BMPs to be implemented as part of the Project to reduce impacts on water quality during construction, including those impacts associated with soil erosion and siltation. With compliance

[51] City of Upland. 2021. *City of Upland 2020 Urban Water Management Plan and Water Shortage Contingency Plan.* June.

with the requirements in the CGP and implementation of construction BMPs, construction impacts related to on- or off-site erosion or siltation would be less than significant.

After the completion of Project construction, the Project would not significantly alter the existing drainage pattern of the site. However, operation of the Project would result in an increase in impervious surfaces on the Project site from approximately 0.57 to 1.65 acres, which would result in a net increase in stormwater runoff that could lead to downstream erosion in receiving waters. However, as discussed above, the infiltration basin and underground storage infiltration system included in the Project's design would be used for stormwater control, treatment, and infiltration in compliance with the requirements of the MS4 Permit. Due to the incorporation of LID techniques as required by the MS4 Permit, operational impacts related to on- or off-site erosion or siltation would be less than significant.

ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite; ***(Less Than Significant Impact)***

Development of the Project would result in an increase in impervious surfaces on the Project site from approximately 0.57 to 1.65 acres, which could have the potential to increase the volume and rate of stormwater runoff discharged from the Project site. However, as previously discussed, an infiltration basin and underground storage infiltration system included in the Project's design would be used for stormwater control, treatment, and infiltration in compliance with the requirements of the MS4 Permit. The proposed drainage facilities and BMPs needed to accommodate stormwater runoff would be appropriately sized so that on-site flooding would not occur. Therefore, due to the implementation of LID techniques as required by the MS4 Permit, the Project would not substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off site. Impacts would be less than significant, and no mitigation is required.

iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; ***(Less Than Significant Impact)***

Stormwater Drainage System Capacity. Under existing conditions, stormwater flows to the southwest to a natural ravine which discharges into an existing ditch along the freeway right-of-way which discharges to a City of Fontana storm drain along Poplar Avenue that discharges to the San Sevaine Channel, which flows to the Santa Ana River Reach 3, which drains to the Prado Dam. Prado Dam drains to Santa Ana River Reach 2, which flows to Santa Ana River Reach 1, which discharges to the Pacific Ocean.[52] The Project would include an infiltration basin and underground storage infiltration system, which would reduce site discharge to not exceed pre-developed flow rates. The proposed drainage facilities would be designed in compliance with the MS4 Permit. The proposed drainage facilities and BMPs needed to accommodate stormwater runoff would be appropriately sized such that drainage facility capacity would not be exceeded during a design storm. Therefore, the Project would not result in an exceedance of planned or existing stormwater drainage systems, and impacts would be less than significant.

[52] Land Development Design Company, LLC. 2024. Op. cit.

Polluted Runoff. As discussed in Section 4.10.a, pollutants of concern during construction include sediments, trash, petroleum products, concrete waste (dry and wet), sanitary waste, and chemicals, and each of these pollutants on its own or in combination with other pollutants can have a detrimental effect on water quality. Drainage patterns would be temporarily altered during grading and other construction activities, and construction-related pollutants could be spilled, leaked, or transported via storm runoff into adjacent drainages and downstream receiving waters. However, as previously discussed, the Project would be required to comply with the requirements set forth by the CGP, including preparation of an SWPPP, which would specify BMPs to be implemented to control the discharge of pollutants in stormwater runoff as a result of construction activities. Therefore, construction-related impacts would be less than significant, and no mitigation is required.

Expected pollutants of concern from long-term operations include suspended solids/sediment, nutrients, oil and grease, metals, and trash and debris. As previously discussed, compliance with the MS4 Permit, the implementation of LID techniques, and the incorporation of operational BMPs to target pollutants of concern would ensure that the Project would not discharge substantial sources of polluted runoff from the Project site. Operation-related impacts would be less than significant, and no mitigation is required.

iv. Impede or redirect flood flows? ***(No Impact)***

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) No. 06071C7870J, the Project site is located in Zone X, which is identified as an area of minimal flood hazard.[53] The Project would not alter the topography of the Project site, which is relatively flat, and would not substantially alter drainage patterns. Because the Project would not place improvements and structures directly within a 100-year floodplain, the Project would not impede or redirect flood flows, and there would be no impact.

d. In flood hazard, tsunami, or seiche zones, would the project risk release of pollutants due to project inundation? ***(No Impact)***

Flooding. According to FEMA FIRM No. 06071C7870J, the Project site is located in Zone X, which is identified as an area of minimal flood hazard.[54] Therefore, the Project would not risk release of pollutants due to Project inundation due to flood hazard.

Tsunami. The Project site is approximately 38 miles northeast of the Pacific Ocean at an elevation over 1,600 feet above mean sea level (amsl). Based on the distance from the Pacific Ocean, the Project site is not located in a tsunami hazard zone and therefore would not be susceptible to impacts associated with a tsunami.

Seiches. Seiches are waves created in an enclosed body of water (e.g., a bay, lake, or harbor) that go up and down or oscillate and do not progress forward like standard ocean waves. Limited isolated

53 Federal Emergency Management Agency (FEMA). 2016. Flood Insurance Rate Map No. 06071C7870J. Map Revised September 2, 2016. Website: https://msc.fema.gov/portal/search (accessed July 5, 2024).

54 Ibid.

damage to adjacent and down-slope structures has been observed from seiches occurring in swimming pools and in small shallow lakes and ponds. There are no sizeable enclosed bodies of water in the nearby vicinity of the Project site. Therefore, the Project would not risk release of pollutants due to Project inundation due to seiche.

Dam Inundation. The Project site is not located within a mapped dam failure inundation area.[55] Therefore, the Project site is not at risk of inundation due to dam failure, and no impact would occur.

e. Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan? ***(Less Than Significant Impact)***

The Project is within the jurisdiction of the Santa Ana RWQCB. The Santa Ana RWQCB adopted a Basin Plan (January 1995, with amendments effective on or before June 2019) that designates beneficial uses for all surface and groundwater within their jurisdiction and establishes the water quality objectives and standards necessary to protect those beneficial uses. As previously discussed, the Project would comply with existing NPDES permit requirements, including the CGP and MS4 Permit, and would implement construction and operational BMPs to reduce pollutants of concern in stormwater runoff. Compliance with these regulatory requirements would ensure that the Project would not degrade or alter water quality, cause the receiving waters to exceed the water quality objectives, or impair the beneficial use of receiving waters. As such, the Project would not result in water quality impacts that would conflict with the Basin Plan. Construction and operational impacts related to a conflict with the Basin Plan would be less than significant.

The Sustainable Groundwater Management Act (SGMA), which was enacted in September 2014, requires governments and water agencies of high- and medium-priority basins to halt overdraft of groundwater basins. The SGMA requires the formation of local Groundwater Sustainability Agencies (GSAs), which are required to adopt Groundwater Sustainability Plans (GSPs) to manage the sustainability of the groundwater basins. The Project site is in the Upper Santa Ana Valley – Chino Groundwater Basin, which the California Department of Water Resources designates as a very low priority basin. [56] Therefore, development of a GSP is not required for the basin associated with the Project.

As discussed above, the Project would comply with regulatory requirements to treat pollutants in stormwater runoff during construction and operation of the Project. Compliance with these regulatory requirements would ensure that stormwater that may infiltrate during construction or operation of the Project would be treated prior to reaching groundwater. Therefore, the Project would not affect groundwater quality (Upper Santa Ana Valley – Chino Groundwater Basin). As previously stated, development of the Project would increase the impervious surface on the Project site by 1.1 acres. Although, development of the Project would increase the impervious surface area

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55 California Department of Water Resources (DWR). 2015. Division of Safety of Dams. *Dam Breach Inundation Map Web Publisher.* Website: https://fmds.water.ca.gov/webgis/?appid=dam_prototype_v2 (accessed July 5, 2024).

56 California Department of Water Resources. 2020. *Sustainable Groundwater Management Act 2019 Basin Prioritization Process and Results.* May.

on the Project site and decrease on-site infiltration, the Project would collect and infiltrate stormwater from the Project site. Therefore, the Project would not substantially impact groundwater supplies (Upper Santa Ana Valley – Chino Groundwater Basin). Furthermore, as previously stated, the Project site is located within a very low priority basin and therefore the SGMA provisions do not apply. Impacts related to a conflict with or obstruction of a water quality control plan or sustainable groundwater management plan would be less than significant, and no mitigation is required.

4.11 LAND USE AND PLANNING

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☒	☐

*a. Would the project physically divide an established community? **(No Impact)***

The physical division of an established community typically refers to the construction of a physical feature (e.g., an interstate highway or railroad tracks) or removal of a means of access (e.g., a local road or bridge) that would impair mobility within an existing community or between a community and outlying areas. For instance, the construction of an interstate highway through an existing community may constrain travel from one side of the community to another; similarly, such construction may also impair travel to areas outside the community.

The Project would result in the construction of a new 3,698-square-foot SAWCo headquarters and associated improvements including a 4,066-square-foot maintenance building, maintenance yard, driveway, parking, solar cover, landscaping, and utility improvements. The Project site is generally surrounded by a mix of residential, commercial, and industrial uses, and the Project would be consistent with the type and intensity of development in the area. Vehicular access to the Project site would be provided via two new driveways located along the northern and eastern property boundaries. The Project would not require the construction of any new infrastructure that would divide an established community and would not remove any means of access. Therefore, the Project would have no impact related to physically dividing an established community, and no mitigation is required.

*b. Would the project cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect? **(Less Than Significant Impact)***

The Project would result in the construction of a new 3,698-square-foot SAWCo headquarters and associated improvements including a 4,066-square-foot maintenance building, maintenance yard, driveway, parking, solar cover, landscaping, and utility improvements. The main documents guiding development and regulating land uses in Upland are the City's General Plan and Zoning Code. The proposed use is not currently permitted at the site under the current SFR-L General Plan land use designation and RS-10 zoning. To comply with the City's General Plan and zoning regulations, the Project will require a General Plan amendment and a zone change to Public Utilities (PU) land use designation and Public/Institutional (PB/I) zoning.

The PU designation provides areas for landfills, flood control/recharge facilities and public utilities including gas, electricity, and water. The purpose of the PB/I zone is to allow for public and quasi-

public facilities that serve Upland residents and visitors. The PU designation and PB/I zone allow a maximum floor-area ratio (FAR) of 0.5. The Project would have a FAR of 0.07 and is consistent with the allowed uses of the PB/I zone and PU designation.

It should be noted that according to CEQA, policy conflicts do not, in and of themselves, constitute a significant environmental impact. Policy conflicts are considered to be environmental impacts only when they would result in direct physical impacts or where those conflicts relate to avoiding or mitigating environmental impacts. As such, associated physical environmental impacts are discussed in this IS/MND under specific topical sections. The Project would not result in any direct physical impacts that cannot be mitigated to a less than significant level. As a result of the proposed rezone and General Plan amendment, the Project would not conflict with any applicable land use plans, policies, or regulations that were adopted for the purpose of avoiding or mitigating an environmental effect, and this impact would be less than significant.

4.12 MINERAL RESOURCES

	Potentially Significant Impact	Less Than Significant 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?	☐	☐	☐	☒

*a. Would the project 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)***

The Surface Mining and Reclamation Act (SMARA) enacted by the California Legislature in 1975 provides guidelines to assist with the classification and designation of mineral lands. Areas are classified on the basis of geologic factors without regard to existing land uses and ownership. SMARA categorizes areas into four Mineral Resource Zones (MRZs):

- **MRZ-1:** An area where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence.
- **MRZ-2:** An area where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence.
- **MRZ-3:** An area containing mineral deposits of which their significance cannot be properly evaluated.
- **MRZ-4:** An area where information is not adequate enough to be able to assign to any other MRZ zone.

The entire City of Upland is classified as MRZ-2. Geologic data indicate that significant PCC-Grade aggregate resources are present within the City, which is attributed to its location below the foothills of the San Gabriel Mountains and atop the San Antonio Creek and Cucamonga Creek alluvial fans. The City's known mineral resources are in the form of aggregate materials located within the San Antonio Creek and Cucamonga Creek drainage areas.[57]

Despite the mineral resource designations, no mineral resource extraction activities occur at the Project site under existing conditions. The Project site is not designated as a local mineral resource holding and deposit area or a sector designated by the State Mining and Geology Board as

[57] City of Upland. 2015a. *Final Program Environmental Impact Report General Plan Update (GPU 08-03), Zoning Code Update (ZCU 08-03), Climate Action Plan, and Cable Airport Land Use Compatibility Plan Update SCH No. 2012041006)*. September 28.

containing regionally significant PCC-grade aggregate resources.[58] The Project would develop the Project site with a new SAWCo headquarters and associated improvements, and no mineral resource extraction activities are proposed as part of the Project. As such, the Project would not 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, and no impact would occur.

b. Would the project 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)***

The City of Upland General Plan Land Use Element does not include a land use designation specifically intended for mineral production or development of natural resources (i.e., rock and gravel production). Thus, there is no locally important mineral resource recovery site delineated on the current General Plan Land Use Map. Given existing and proposed conditions on site, implementation of the Project would not 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 would occur, and no mitigation is required.

58 City of Upland. 2015b. Op. cit.

4.13 NOISE

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project result in:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) For a project located within the vicinity of a private airstrip or 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 expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

The following discussion and analyses are based on the findings included in the Noise and Vibration Impact Analysis[59] completed for the Project, which is included as **Appendix F** to this IS/MND.

a. Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? ***(Less Than Significant Impact)***

The primary existing noise sources in the Project area are transportation facilities, including SR-210 to the south. To assess the existing noise conditions in the area, long-term noise measurements were conducted at the Project site. Two long-term, 24-hour measurements were taken from July 16, 2024, to July 17, 2024. Table 4.13.A provides a summary of the existing noise levels and calculated Community Noise Equivalent Level (CNEL) level from the long-term noise level measurements. As shown in Table 4.13.A, the calculated CNEL levels reached 70.1 decibels (dBA) CNEL. Hourly noise levels at surrounding uses are as low as 57.9 dBA equivalent continuous sound level (L_{eq}) during nighttime hours and 59.8 dBA L_{eq} during daytime hours.

Short-Term Construction-Related Impacts. Noise impacts associated with construction activities are regulated by Section 9.40.100 (M) of the City's Municipal Code, which limits construction activities to the hours between 7:00 a.m. and 6:00 p.m. on weekdays.[60] While the City establishes limits to the hours during which construction activity may take place, it has not established numeric maximum acceptable construction source noise levels at potentially affected receivers, which would allow for a quantified determination of what CEQA constitutes as a substantial temporary or periodic noise increase.

59 LSA. 2024e. *Noise and Vibration Impact Analysis for the Proposed San Antonio Water Headquarters in Upland, California* (LSA Project No. 20241723). November.

60 City of Upland. 2015d. *Municipal Code, Noise Ordinances.* March 13.

Table 4.13.A: Existing Noise Level Measurements

Location Number	Location Description	Daytime Noise Levels[1] (dBA L_{eq})	Evening Noise Levels[2] (dBA L_{eq})	Nighttime Noise Levels[3] (dBA L_{eq})	Average Daily Noise Levels (dBA CNEL)
LT-1	On a light pole at the end of 20th Street across from the northeastern corner of the Project site, approximately 490 feet away from the SR-210 centerline and 355 feet away from the North Campus Avenue centerline.	59.8–67.4	60.6–61.9	57.9–64.9	68.1
LT-2	On a light pole across from the southwestern corner of the Project site, approximately 175 feet away from the SR-210 centerline.	63.4–68.9	63.6–64.4	61.1–65.0	70.1

Source: Compiled by LSA (2024).
[1] Daytime Noise Levels = noise levels during the hours of 7:00 a.m. to 7:00 p.m.
[2] Evening Noise Levels = noise levels during the hours of 7:00 p.m. to 10:00 p.m.
[3] Nighttime Noise Levels = noise levels during the hours of 10:00 p.m. to 7:00 a.m.
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
ft = foot/feet
L_{eq} = equivalent continuous sound level

Therefore, a numerical construction threshold based on the Federal Transit Administration's (FTA) *Transit Noise and Vibration Impact Assessment Manual* (FTA Manual)[61] is used for analysis of daytime construction impacts. The FTA considers a daytime exterior construction noise level of 80 dBA L_{eq} 1-hour as a reasonable threshold for residential uses, 85 dBA L_{eq} 1-hour for commercial uses, and 90 dBA L_{eq} 1-hour for industrial land.

Two types of short-term noise impacts could occur during the construction of the Project. First, construction crew commutes and the transport of construction equipment and materials to the site for the Project would incrementally increase noise levels on access roads leading to the site. Although there would be a relatively high single-event noise-exposure potential causing intermittent noise nuisance (passing trucks at 50 feet would generate up to 84 dBA Lmax), the effect on longer-term ambient noise levels would be small compared to existing daily traffic volumes on East 20th Street. As detailed in the Noise and Vibration Analysis completed for the Project, the expected traffic noise level increase would be approximately 1.7 dBA. A noise level increase of less than 3 dBA would not be perceptible to the human ear in an outdoor environment. Therefore, short-term, construction-related impacts associated with worker commute and equipment transport to the Project site would be less than significant.

61 Federal Transit Administration (FTA). 2018. *Transit Noise and Vibration Impact Assessment Manual*. Office of Planning and Environment. Report No. 0123. September.

The second type of short-term noise impact is related to noise generated during construction, which includes site preparation, grading, building construction, paving, and architectural coating on the Project site. As detailed in the Noise and Vibration Analysis completed for the Project, the Project construction composite noise levels at a distance of 50 feet (ft) would range from 74 dBA Leq to 86 dBA Leq, with the highest noise levels occurring during the grading phase. Table 4.13.B shows the nearest sensitive uses to the Project site, their distance from the center of construction activities, and composite noise levels expected during construction. These noise level projections do not consider intervening topography or barriers.

Table 4.13.B: Potential Construction Noise Impacts at Nearest Receptor

Receptor (Location)	Composite Noise Level (dBA L_{eq}) at 50 feet[1]	Distance (feet)	Composite Noise Level (dBA L_{eq})
Residential (North)	86	250	72
Residential (West)		405	68

Source: Compiled by LSA (2024).

[1] The composite construction noise level represents the grading phase which is expected to result in the greatest noise level as compared to other phases.

dBA L_{eq} = average A-weighted hourly noise level

While construction noise will vary, it is expected that composite noise levels during construction at the nearest sensitive residential uses to the north and west would approach 72 dBA L_{eq} and 68 dBA L_{eq}, respectively, during daytime hours. These predicted noise levels would only occur when all construction equipment is operating simultaneously and, therefore, are assumed to be rather conservative in nature. While construction-related short-term noise levels have the potential to be higher than existing ambient noise levels in the Project area under existing conditions, the noise impacts would no longer occur once Project construction is completed.

As stated above, the City's Noise Ordinance regulates noise impacts associated with construction activities. The Project would comply with the construction hours specified in the City's Noise Ordinance, which states that construction activities are allowed between the hours of 7:00 a.m. and 6:00 p.m. on weekdays. As it relates to off-site uses, construction-related noise impacts would remain below the 80 dBA L_{eq} 1-hour construction noise level criteria for daytime construction noise level criteria as established by the FTA for residential land uses. Therefore, impacts would be less than significant and no mitigation is required.

Long-Term Noise Impacts. The Project would generate long-term noise impacts from both traffic and stationary noise sources, as discussed below. The City's noise standards correlate with land use zoning classifications to maintain identified ambient noise levels and to limit, mitigate, or eliminate intrusive noise that exceeds the ambient noise levels within a specified zone. As shown in Table 4.13.C, the City has adopted local guidelines based, in part, on the community noise compatibility guidelines established by the Governor's Office of Planning and Research for use in assessing the compatibility of various land use types with a range of noise levels.

Table 4.13.C: City of Upland Exterior Noise Compatibility Standards

Land Use Type	Highest Level of noise Exposure that is Regarded as "Normally Acceptable" (L_{dn} of CNEL)
Residential – Low Density Single-Family, Duplex, Mobile Homes	60 dBA
Residential – Multi-Family	65 dBA
Mixed-Use	70 dBA
Transient Lodging – Hotels, Motels	65 dBA
Schools, Libraries, Churches, Hospitals, Nursing Homes	70 dBA
Auditoriums, Concert Halls, Amphitheaters	Mitigation based on site-specific study
Sports Arena, Outdoors Spectator Sports	Mitigation based on site-specific study
Playgrounds, Neighborhood Parks	70 dBA
Golf Course, Riding Stables, Water Recreation, Cemeteries	75 dBA
Office Building – Commercial, Office/Professional	70 dBA
Industrial, Manufacturing, Utilities, Agriculture	75 dBA

Sources: Governor's Office of Planning and Research, State of California General Plan Guidelines 2003, 2003, pages 244-254; City of Upland General Plan, Safety Element (City of Upland 2015d).
CNEL = Community Noise Equivalent Level
L_{dn} = Day-Night Noise Level
dBA = A-weighted decibel

The City of Upland Municipal Code Chapter 9.40, Unnecessary Noise, limits the noise level generated on a property that can cross to a neighboring property. The City's noise ordinance limits are presented in terms of a 1-hour average sound level and apply to residential uses only. As prescribed in Section 9.40.040, the exterior noise standards for sensitive residential uses are 55 dBA between 7:00 a.m. and 10:00 p.m. (daytime) and 45 dBA between 10:00 p.m. and 7:00 a.m. (nighttime). Ordinance limits generally apply to "stationary" sources such as mechanical equipment, manufacturing activities, or vehicles operating on private property.

Traffic Noise Impacts. The guidelines included in the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77 108) were used to evaluate highway traffic-related noise conditions along roadway segments in the Project vicinity. As detailed in the Noise and Vibration Analysis completed for the Project, the increase in Project-related traffic noise would be greater than 3 dBA, which is perceptible to the human ear in an outdoor environment. However, the generated CNEL noise levels would be below 60 dBA CNEL, which is acceptable for low-density residential uses as specified in the City's General Plan. Therefore, traffic noise impacts from Project-related traffic on off-site sensitive receptors would be less than significant, and no mitigation measures are required.

Stationary Noise Impacts. Adjacent off-site land uses would be potentially exposed to stationary-source noise impacts from rooftop heating, ventilation, and air conditioning (HVAC) equipment and proposed truck arrival and departure activities. The potential noise impacts to off-site sensitive land uses from the proposed operations are discussed below.

> ***Heating, Ventilation, and Air Conditioning Equipment.*** The Project would have various rooftop mechanical equipment, including HVAC units, atop the proposed buildings. Based on the Project site plan, the Project is assumed to have two rooftop HVAC units atop each proposed building

(main building and maintenance building) and assumed to operate 24 hours per day. The HVAC equipment could operate 24 hours per day and would generate sound power levels (Lw) of up to 87 dBA Lw or 72 dBA L_{eq} at 5 feet, based on manufacturer data.[62]

Truck Arrival and Departure Activities. Noise levels generated by delivery trucks would be similar to noise readings from truck loading and unloading activities, which generate a noise level of 75 dBA L_{eq} at 20 feet based on measurements taken by LSA (*Operational Noise Impact Analysis for Richmond Wholesale Meat Distribution Center*).[63] Shorter term noise levels that occur during the docking process taken by LSA for the *Operational Noise Impact Analysis for Richmond Wholesale Meat Distribution Center* were measured to be 76.3 dBA L_{eq} at 20 feet. These noise level measures are relevant to the Project because delivery trucks are anticipated during operation of the Project. Delivery trucks would arrive on site and maneuver their trailers so that trailers would be parked within the loading docks. During this process, noise levels are associated with the truck engine noise, air brakes, and back-up alarms while the truck is backing into the dock. These noise levels would occur for a shorter period of time (less than 5 minutes). After a truck enters the loading dock, the doors would be closed, and the remainder of the truck loading activities would be enclosed and therefore much less perceptible. Consistent with the Traffic Impact Analysis for the San Antonio Water Company Headquarters Project,[64] it is assumed that truck arrivals and departure activities could occur at 6 parking spaces during peak hour for a period of less than 5 minutes each.

Cumulative Operations Noise Assessment. Tables 4.13.D and 4.13.E below show the combined hourly noise levels generated by HVAC equipment and truck delivery activities at the closest off-site land uses. The results indicated that operational noise levels would be below the daytime hourly noise level standards of 55 dBA L_{eq} for residential uses. Although the operational noise levels may exceed the nighttime hourly noise level standards of 45 dBA L_{eq}, ambient noise levels would not increase by 5 dBA or more. Therefore, operations of the Project would be less than significant and no mitigation is required.

Table 4.13.D: Daytime Exterior Noise Level Impacts

Receptor	Direction	Existing Quietest Daytime Noise Level (dBA L_{eq})	Project Generated Noise Levels (dBA L_{eq})	Potential Operational Noise Impact?[1]
Residential	North	59.8	47.0	No
Residential	West	63.4	46.7	No

Source: Compiled by LSA (2024).

[1] A potential operational noise impact would occur if (1) the quietest daytime ambient hour is less 55 dBA L_{eq} at the nearest residential uses and Project noise impacts are greater 55 dBA L_{eq} at the nearest residential uses, or (2) the quietest daytime ambient hour is greater than 55 dBA L_{eq} at the nearest residential uses and Project noise impacts are 3 dBA greater than the quietest daytime ambient hour.

dBA L_{eq} = average A-weighted hourly noise level

62 Trane. n.d. *Fan Performance - Product Specifications RT-PRC023AU-EN.*

63 LSA. 2016. *Operational Noise Impact Analysis for Richmond Wholesale Meat Distribution Center.*

64 LSA. 2024b. *Traffic Impact Analysis San Antonio Water Headquarters Project*. November.

Table 4.13.E: Nighttime Exterior Noise Level Impacts

Receptor	Direction	Existing Quietest Nighttime Noise Level (dBA L_{eq})	Project Generated Noise Levels (dBA L_{eq})	Potential Operational Noise Impact?[1]
Residential	North	57.9	47.0	No
Residential	West	61.1	46.7	No

Source: Compiled by LSA (2024).

[1] A potential operational noise impact would occur if (1) the quietest nighttime ambient hour is less 45 dBA L_{eq} at the nearest residential uses and Project noise impacts are greater than 45 dBA L_{eq} at the nearest residential uses, or (2) the quietest nighttime ambient hour is greater than 45 dBA L_{eq} at the nearest residential uses and Project noise impacts are 3 dBA greater than the quietest nighttime ambient hour.

dBA L_{eq} = average A-weighted hourly noise level

b. Would the project result in generation of excessive groundborne vibration or groundborne noise levels? ***(Less Than Significant Impact)***

Vibration standards included in the FTA Manual are used in this analysis for ground-borne vibration impacts on human annoyance. Table 4.13.F provides the criteria for assessing the potential for interference or annoyance from vibration levels in a building.

Table 4.13.F: Criteria for Potential Vibration Annoyance

Land Use	Max L_v (VdB)[1]	Description of Use
Workshop	90	Distinctly feelable vibration. Appropriate to workshops and non-sensitive areas.
Office	84	Feelable vibration. Appropriate to offices and non-sensitive areas.
Residential Day	78	Feelable vibration. Appropriate for computer equipment and low-power optical microscopes (up to 20X).
Residential Night and Operating Rooms	72	Vibration not feelable, but ground-borne noise may be audible inside quiet rooms. Suitable for medium-power microscopes (100X) and other equipment of low sensitivity.

Source: *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018).

[1] As measured in 1/3-octave bands of frequency over the frequency range 8 to 80 Hz.

FTA = Federal Transit Administration
Hz = hertz
L_V = velocity in decibels
Max = maximum
VdB = vibration velocity decibels

The criteria for environmental impacts resulting from ground-borne vibration and noise are based on the maximum levels for a single event. The City's Municipal Code does not include specific criteria for assessing vibration impacts associated with damage. Therefore, for the purpose of determining the significance of vibration impacts experienced at sensitive uses surrounding the Project site, the guidelines within the 2018 FTA Manual have been used to determine vibration impacts. The FTA Manual guidelines show that a vibration level of up to 0.2 inches per second (in/sec) in peak particle velocity (PPV) is considered safe for non-engineered timber and masonry buildings and would not result in any construction vibration damage. Therefore, in order to be conservative, the 0.2 in/sec in the PPV threshold has been used when evaluating vibration impacts at the nearest structures to the site.

Construction-Period Impacts. Ground-borne noise and vibration from construction activity would be mostly low. The closest structures, which are associated with the residential uses to the west, are approximately 60 feet from the western Project construction boundary. As detailed in the Noise and Vibration Impact Analysis completed for the Project, it is expected that vibration levels generated by dump trucks and other large equipment would generate ground-borne vibration levels of up to 0.024 PPV (in/sec) at the closest structure to the Project site. This vibration level would not exceed the 0.2 in/sec PPV threshold considered safe for non-engineered timber and masonry buildings. Therefore, construction would not result in any vibration damage. Impacts would be less than significant, and no mitigation is required.

Long-Term Noise Impacts. The Project would not generate noticeable vibration levels related to on-site operations. Trucks traveling to and from the Project site as well as loading and unloading activities may generate vibration levels. However, the closest off-site uses are greater than 25 feet away and vibration levels generated from trucks would not be perceptible. In addition, vibration levels generated from Project-related traffic on the adjacent roadways are unusual for on-road vehicles because the rubber tires and suspension systems of on-road vehicles provide vibration isolation. Based on a reference vibration level of 0.089 in/sec PPV, structures greater than 25 feet from the roadways that contain Project trips would experience vibration levels below the most conservative standard of 0.12 in/sec PPV; therefore, vibration levels generated from Project-related traffic on the adjacent roadways would be less than significant, and no mitigation measures are required.

c. For a project located within the vicinity of a private airstrip or 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 expose people residing or working in the project area to excessive noise levels? ***(No Impact)***

The nearest airport to the Project site is the Cable Airport, located approximately 2.6 miles northeast of the Project site. The Project site and surrounding sensitive uses are located well outside of the 60 dBA CNEL contour. Therefore, the Project would not be adversely affected by airport/ airfield noise. No impact would occur, and no mitigation is required.

4.14 POPULATION AND HOUSING

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☒	☐
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

a. Would the project induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)? ***(Less Than Significant Impact)***

State CEQA Guidelines Section 15126.2[d] identifies a project as growth inducing if it fosters economic or population growth, or the construction of additional housing either directly or indirectly in the surrounding environment. New employees from commercial or industrial development and new population from residential development represent direct forms of growth, which have a secondary effect of expanding the size of local markets and inducing additional economic activity in the area.

Under CEQA, growth inducement is not considered necessarily detrimental, beneficial, or of little significance to the environment. Typically, the growth-inducing potential of a project would be considered substantial if it fosters growth or a concentration of population in excess of what is assumed in pertinent master plans, land use plans, or in projections made by regional planning agencies.

The Project includes the construction of a new 3,698-square-foot SAWCo headquarters and associated improvements including a 4,066-square-foot maintenance building, maintenance yard, driveway, parking, solar cover, landscaping, and utility improvements. It is anticipated that approximately 10 people would be employed on the Project site, an increase of 5 people compared to the 5 people that are currently employed on the Project site under existing conditions.

Construction of the Project would provide short-term construction jobs over an approximately 20-month period. Many of the construction jobs would be temporary and would be specific to the variety of construction activities. The workforce would include a variety of construction trade workers (e.g., cement finishers, ironworkers, welders, carpenters, electricians, painters, and laborers). Generally, construction workers are only at a job site for the time frame in which their specific skills are needed to complete that phase of construction. Although the Project would increase the number of employees at the Project site during construction activities, it is expected that local and regional construction workers would be available to serve the Project's construction

needs. Therefore, construction of the Project would not directly or indirectly induce population growth by drawing workers from outside the area on a permanent basis.

The Project would not result in direct population growth as the use proposed is not residential and would not contribute to permanent residency on site. Although the Project would result in 5 additional employees at the Project site, it is unlikely that a substantial number of employees would relocate from outside the region to meet the need for employees resulting from implementation of the Project. Furthermore, the Project would be located within a developed area of Upland that is already served by all utilities. The existing regional infrastructure and the established roadway network would be utilized by employees accessing the Project site. The Project would not require the construction of new infrastructure, such as roads or utilities, that would indirectly induce population or growth. Furthermore, after the City's General Plan amendment and zone change, the Project would be consistent with the General Plan land use designation and zoning designation for the site and would not generate growth beyond that anticipated in the General Plan. Therefore, the Project would not directly or indirectly induce population growth, and this impact would be considered less than significant. No mitigation is required.

b. Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere? ***(No Impact)***

The Project includes the construction of a new 3,698-square-foot SAWCo headquarters and associated improvements including a 4,066-square-foot maintenance building, maintenance yard, driveway, parking, solar cover, landscaping, and utility improvements. Under existing conditions, the Project site does not contain any residential uses and construction of the Project would not displace existing residents within the nearby residential areas. Therefore, the Project would not result in the displacement of people or housing and would not require the construction of replacement housing elsewhere, and there would be no impact.

4.15 PUBLIC SERVICES

	Potentially Significant Impact	Less Than Significant 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, 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 public services:				
i. Fire protection?	☐	☐	☒	☐
ii. Police protection?	☐	☐	☒	☐
iii. Schools?	☐	☐	☒	☐
iv. Parks?	☐	☐	☒	☐
v. Other public facilities?	☐	☐	☒	☐

a. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, 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 public services:

i. Fire protection? ***(Less Than Significant Impact)***

The San Bernardino County Fire Protection District (SBCFPD) provides fire protection and emergency medical response services throughout the City. SBCFPD's service area includes over 2 million residents within a 278 square mile region through 50 fire stations with 1,166 employees.[65] There are five fire stations in Upland, with the closest fire station to the Project site being Fire Station 164 located at 1825 North Campus Avenue, approximately 0.35 mile south of the Project site.

The Project includes the construction of a new 3,698-square-foot SAWCo headquarters and associated improvements including a 4,066-square-foot maintenance building, maintenance yard, driveway, parking, solar cover, landscaping, and utility improvements. The Project could result in an incremental increase in demand for fire protection service due to the increase in daytime population at the Project site as a result of additional employees at the Project site. However, the Project would be required to comply with all applicable codes for fire safety and emergency access and the Project Applicant would be required to submit plans to SBCFPD for review and approval prior to the issuance of building permits to ensure the Project would conform to applicable building and fire codes. Additionally, the Project Applicant would be required to pay a fire development impact fee

[65] San Bernardino County Fire Protection District. 2024. *San Bernardino County Fire Statistics, Fiscal Year 2022-23.* Website: https://sbcfire.org/statistics/#statistics-total-anchor (accessed July 10, 2024).

which would be directed towards maintaining adequate service levels, ensuring that any impact to fire protection services that could result from the Project would be offset by development fees.

The SBCFPD would continue providing services to the Project site and would not require additional firefighters to serve the Project. The construction of a new or expanded fire station would not be required. The Project would not result in a significant impact on the physical environment due to the incremental increase in demand for fire protection and life safety services. The incremental increase in demand for services is not expected to adversely affect existing response times to the site or within the City. Therefore, construction and operation of the Project would have a less than significant impact on fire protection and safety services and facilities.

ii. Police protection? ***(Less Than Significant Impact)***

The Upland Police Department (UPD) provides police protection services to the City and Project site. The UPD headquarters are located at 1499 West 13th Street, approximately 2.4 miles southwest of the Project site. UPD's service area includes approximately 79,000 residents within a 15.3-square-mile region. UPD includes an Operations Division, Administrative Division, Special Services and Events Division, and Traffic Division. The UPD is currently meeting its target response time of 5 minutes for Priority 1 calls which consist of in-progress emergencies where there is an immediate threat to life or an immediate need for assistance.[66]

The Project includes the construction of a new 3,698-square-foot SAWCo headquarters and associated improvements including a 4,066-square-foot maintenance building, maintenance yard, driveway, parking, solar cover, landscaping, and utility improvements. The Project could result in an incremental increase in demand for police protection service due to the increase in daytime population at the Project site as a result of additional employees at the Project site. However, the Project would be required to implement Crime Prevention Through Environmental Design principles, and the Project Applicant would be required to pay a police development impact fee that would be directed towards maintaining adequate service levels, ensuring that any impact to police protection services that could result from the Project would be offset by development fees.

The UPD would continue providing services to the Project site and would not require additional police officers to serve the Project. The construction of a new or expanded police station would not be required. The Project would not result in a significant impact on the physical environment due to the incremental increase in demand for police protection services. The incremental increase in demand for services is not expected to adversely affect existing responses times to the site or within the City. Therefore, construction and operation of the Project would have a less than significant impact on police protection services and facilities.

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66 City of Upland. 2015a. *Final Program Environmental Impact Report General Plan Update (GPU 08-03), Zoning Code Update (ZCU 08-03), Climate Action Plan, and Cable Airport Land Use Compatibility Plan Update SCH No. 2012041006)*. September 28.

iii. Schools? ***(Less Than Significant Impact)***

The Upland Unified School District (UUSD), which provides kindergarten through high school education, serves the educational needs in the City of Upland. The UUSD had a 2022–2023 enrollment of 10,079 students and includes 9 elementary schools, 1 TK-8th school, 2 middle schools, and 2 high schools.[67]

The Project does not include any residential uses, and therefore would not directly affect student population. It is anticipated that approximately 10 people would be employed on the Project site, an increase of 5 people compared to the 5 people that are currently employed on the Project site under existing conditions. A fraction of new employees hired as a result of implementation of the Project may move to the City. However, this growth would be minimal and result in an incremental increase in student population and would be spread amongst the whole school district, depending upon place of residence. Therefore, the Project would not result in a substantial increase in the number of school-age children in the area, and this impact would be less than significant.

iv. Parks? ***(Less Than Significant Impact)***

The Project does not include any residential uses and would not generate a direct need for additional park space. Park uses associated with the Project would be minimal and may include local park visits from Project employees during work shifts or on breaks. As noted above, a fraction of employees of the Project may move to the City. However, this growth would only result in an incremental increase in demand for parks, and would be spread throughout the City, depending on place of residence. Therefore, the Project would have a less than significant impact related to parks.

v. Other public facilities? ***(Less Than Significant Impact)***

Development of the Project would not increase demand for other public service including libraries, community centers, and public health care facilities. As previously discussed, the Project does not include development of residential uses and would therefore not result in an increased demand for public facilities, and this impact would be less than significant.

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67 National Center for Education Statistics. 2024. *Search for Public School Districts; District Name: Upland Unified.* Website: https://nces.ed.gov/ccd/districtsearch/district_detail.asp?Search=2&ID2=0600016&DistrictID=0600016&details=1 (accessed July 10, 2024).

4.16 RECREATION

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	☒	☐
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

*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)***

The Project includes the construction of a new 3,698-square-foot SAWCo headquarters and associated improvements including a 4,066-square-foot maintenance building, maintenance yard, driveway, parking, solar cover, landscaping, and utility improvements. The Project would not involve the addition of any housing units that would permanently increase the City of Upland's population. Although the 10 employees associated with the Project could elect to utilize the City's park facilities during lunch breaks or after-work hours, it is unlikely that the use of parks by Project employees would increase the use of those parks to a level that would contribute to substantial physical deterioration of those facilities. Therefore, development of the Project would not create a significant increase in the use of existing neighborhood, regional parks, or other recreational facilities. Impacts would be less than significant, and mitigation is not required.

*b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment? **(No Impact)***

The Project includes the construction of a new 3,698-square-foot SAWCo headquarters and associated improvements including a 4,066-square-foot maintenance building, maintenance yard, driveway, parking, solar cover, landscaping, and utility improvements. The Project does not include recreational facilities as part of its design, nor does it include the expansion of existing recreational facilities. Although the 10 employees associated with the Project site may use nearby recreational facilities, construction of the proposed SAWCo headquarters and associated improvements would not result in a substantial increase in the use of parks or other recreational facilities, and the Project would not require the construction or expansion of existing recreational facilities. There would be no impact, and mitigation is not required.

4.17 TRANSPORTATION

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☒	☐
b) Conflict or be inconsistent with CEQA Guidelines §15064.3, subdivision (b)?	☐	☐	☒	☐
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
d) Result in inadequate emergency access?	☐	☐	☒	☐

The following discussion and analyses are based on the findings included in the Traffic Impact Analysis (TIA)[68] completed for the Project, which is included as **Appendix G** to this IS/MND.

*a. Would the project conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities? **(Less Than Significant Impact)***

The following includes an evaluation of the Project's potential to conflict with applicable programs, plans, ordinances, and policies addressing the circulation system, including the City of Upland's Traffic Impact Analysis (TIA) Guidelines[69] (TIA Guidelines) and the Circulation Chapter of the City's General Plan.

Based on the City's TIA Guidelines, at a minimum, the study area must include all freeway links with 100 or more two-way peak-hour project trips and other Congestion Management Plan (CMP) roadways with 50 or more two-way peak-hour project trips within 5 miles of the Project site. The Project is not anticipated to add 100 or more two-way peak-hour trips to any freeway segment. Therefore, no freeway links were analyzed as part of this analysis. The analysis intersections were approved by the City as part of the scoping process and include the following:

1. Winston Court-Project Driveway /20th Street;
2. Campus Avenue/Project Driveway 3-20th Street.

Trip Generation. The trip generation for the Project was developed using rates from the Institute of Transportation Engineers' (ITE) *Trip Generation Manual* (11th Edition) for Land Use 712 – "Small Office Building". As further detailed in the TIA, the Project is estimated to generate 91 total net daily passenger car equivalent (PCE) trips, with 25 net PCE trips occurring during the a.m. peak hour and 27 net PCE trips occurring during the p.m. peak hour.

68 LSA. 2024b. *Traffic Impact Analysis San Antonio Water Headquarters Project*. November.
69 Fehr and Peers. 2020. *City of Upland Traffic Impact Analysis Guidelines*. July.

Level of Service and Queuing Analysis. The City uses Level of Service (LOS) D as its minimum level of service criterion for all intersections. As detailed in the TIA, all study intersections are forecast to operate at a satisfactory LOS under all scenarios analyzed including opening year (2027) both with and without the Project and horizon year (2050) both with and without the Project. Therefore, the Project is not forecast to cause any LOS or queuing deficiencies at the study intersections and implementation of the Project would not conflict with plans, programs, and policies regarding roadway facilities or decrease the performance of such facilities.

Transit, Roadway, Bicycle, and Pedestrian Facilities. According to the City's TIA Guidelines, a significant impact occurs when a project conflicts with adopted plans, policies, or programs regarding active transportation or public transit facilities, or otherwise decreases the performance or safety of such facilities.

Based on the City's Bikeway Network, Class III bike routes exist on both directions of Campus Avenue north of SR-210 within the Project vicinity. The Project would not modify the existing bike routes along Campus Avenue. As such, the Project would not decrease the performance or safety of any existing or proposed bicycle facility.

According to the City's General Plan, the Project area on Campus Avenue has been identified as an area that needs sidewalks. The Project would not modify any existing sidewalks. As such, the Project would not decrease the performance or safety of any existing or proposed pedestrian facility.

Omnitrans provides both local and regional transit services throughout the region, with 30 fixed routes and 5 OmniGo routes using 178 vehicles. There are no Omnitrans bus routes that operate within the Project vicinity. The Project would not modify or affect any public transit access within the study area.

Therefore, implementation of the Project would not conflict with plans, programs, and policies regarding transit, bicycle, or pedestrian facilities or decrease the performance of such facilities.

Overall, the Project would not conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities. Impacts would be less than significant, and no mitigation is required.

*b. Would the project conflict or be inconsistent with CEQA Guidelines §15064.3, subdivision (b)? **(Less Than Significant Impact)***

On December 28, 2018, the California Office of Administrative Law cleared the revised *State CEQA Guidelines* for use. Among the changes to the guidelines was the removal of vehicle delay and LOS as the sole basis of determining CEQA impacts. With the implementation of the adopted guidelines, transportation impacts are to be evaluated based on a project's effect on vehicle miles traveled (VMT). The City's TIA Guidelines include screening criteria, VMT analysis methodology, VMT impact thresholds, and VMT mitigation measures for projects within the City of Upland.

The City's TIA Guidelines establish a presumption of less than significant VMT impacts related to qualifying land use projects. A project only needs to meet one of three screening criteria to "screen out" of a detailed VMT analysis:

1) **Transit Priority Area (TPA) Screening**: Based on the City's TIA Guidelines, projects located within a TPA may be presumed to have a less than significant impact absent substantial evidence to the contrary.

2) **Low-VMT-Area Screening**: Based on the City's TIA Guidelines, residential and office projects located within a low-VMT-generating area may be presumed to have a less than significant impact absent substantial evidence to the contrary.

3) **Project Type Screening**: The TIA Guidelines recommend that project land uses and development intensities can be presumed to have a less than significant impact absent substantial evidence to the contrary for various local serving projects, including projects that generate less than 250 daily vehicle trips.

The Project site is not located within a TPA, and therefore does not meet the TPA Screening Criteria. The Project is not a residential or office project, and therefore does not meet the Low-VMT-Area Screening Criteria. As discussed under Threshold 4.17.a above, the Project is anticipated to generate 91 daily trips, which is below the City's daily trip threshold of 250 daily trips. Therefore, based on the City's TIA Guidelines, the Project can be screened out from a detailed VMT analysis and is anticipated to have a less than significant VMT impact. Therefore, the Project would not conflict or be inconsistent with *State CEQA Guidelines* Section 15064.3, subdivision (b). Impacts would be less than significant, and no mitigation is required.

c. Would the project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? ***(Less Than Significant Impact)***

The design of the Project does not include any geometric design features or incompatible uses that could substantially increase circulation/traffic hazards. The Project would result in the construction of a new 3,698-square-foot SAWCo headquarters and associated improvements including a 4,066-square-foot maintenance building, maintenance yard, driveway, parking, solar cover, landscaping, and utility improvements. Vehicular access to the Project site would be provided via two paved driveways with gates for security. Two new driveways would be located along the northern and eastern property boundaries. One new 26-foot-wide driveway would be constructed off of East 20th Street along the northern property boundary that would access the visitor and customer parking area. An additional 26-foot-wide driveway would enter the Project site at the northeastern corner and would connect to the intersection of Campus Avenue and East 20th Street approximately 275 feet east of the Project site. This driveway would enter the Project site at the northeastern corner and run south along the eastern property line to access the covered employee parking area, maintenance building, and covered truck parking area. This driveway would serve as a SAWCo maintenance vehicle private access road and would be secured by a 20-foot-wide, 6-foot-tall steel gate located just west of the Campus Avenue and East 20th Street intersection that would be open during business hours. The types of traffic generated during operation of the Project (i.e., passenger

cars and trucks) would be compatible with the type of traffic observed along study area roadways under existing conditions.

As detailed in the TIA, a sight distance analysis for stopping and corner sight distance was conducted at the Project driveways along 20th Street and Campus Avenue to evaluate safe access in and out of the Project site. Sight distance is the length of the visible roadway a driver can see approaching vehicles before their line of sight is blocked by any object. As detailed in the TIA, all driveways would provide adequate sight distance for left-turn maneuvers.

The Project would be required to design, construct, and maintain structures, roadways, and facilities in accordance with applicable standards governing vehicular access. Impacts would be less than significant, and no mitigation is required.

d. Would the project result in inadequate emergency access? ***(Less Than Significant Impact)***

Construction. During short-term construction activities, the Project would not require temporary lane or road closures and therefore would not cause any substantial traffic queuing along 20th Street or Campus Avenue. Therefore, construction of the Project would not physically impair or otherwise interfere with emergency access in the Project vicinity. Impacts related to emergency access in the Project vicinity during Project construction would be less than significant, and no mitigation is required.

Operation. As previously discussed, access to the Project site would be provided via two driveways located along the northern and eastern property boundaries. Two new driveways would be located along the northern and eastern property boundaries. One new 26-foot-wide driveway would be constructed off of East 20th Street along the northern property boundary that would access the visitor and customer parking area. An additional 26-foot-wide driveway would enter the Project site at the northeastern corner and would connect to the intersection of Campus Avenue and East 20th Street approximately 275 feet east of the Project site. The Project would not modify the existing roadway network such that it would result in a change in the access for emergency vehicles adjacent to the Project site. In accordance with the California Fire Code, the Project Applicant is required to design, construct, and maintain structures, roadways, and facilities to maintain appropriate emergency/evacuation access to and from the Project site. All site access points and driveway aprons would be designed and constructed to adequate widths for public safety pursuant to the San Bernardino County Fire Protection District (SBCFPD). Site design and compliance with standard and emergency SBCFPD and City requirements, such as the size and location of fire access routes and fire truck turning radii, would allow for proper site evacuation, if necessary, during Project operations. Therefore, the Project would not result in inadequate emergency access during Project operation. Impacts would be less than significant, and no mitigation is required.

4.18 TRIBAL CULTURAL RESOURCES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k)? Or	☐	☒	☐	☐
ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1? In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☒	☐	☐

a. Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k)? ***(Less than Significant with Mitigation Incorporated)***

As detailed in Section 4.5, Cultural Resources, the following tasks were completed to identify potential historical resources on the Project site: (1) a records search was conducted at the South Central Coastal Information Center (SCCIC) at California State University, Fullerton and the Sacred Lands File (SLF) from the Native American Heritage Commission (NAHC) (2) archival research; and (3) field surveys were conducted on the site on July 8, 2024, and August 6, 2024.

The only historic-period (50 years of age or older) resource that was identified in the Project site is a mostly subterranean, concrete water reservoir that was built in 1930 as part of the irrigation system for nearby citrus groves. The reservoir was evaluated for historical significance using the criteria for listing in the California Register of Historical Resources and designation as a City Cultural Resource and it did not meet any of the State or local criteria and therefore is not considered a historical resource pursuant to Section 15064.5 of the *State CEQA Guidelines.* No archaeological resources are documented within a 0.5 mile of the Project site, and none were identified during the archaeological

survey. Despite the lack of surface visibility, the parcel has been severely disturbed and the sensitivity for subsurface resources is low.

Native American consultation was conducted by the City in compliance with AB 52 and SB18. As part of the consultation process, a review of the SLF by the NAHC indicated that the results of the file search were positive and NAHC identified methodologies and contacts for conducting the required AB 52 and SB 18 tribal consultation. The NAHC recommended that 25 Native American individuals representing the Agua Caliente, Cahuila, Gabrieleno, Gabrielino Tongva, Morongo, Quechan, San Manuel, Santa Rosa, Serrano, and Soboba groups be contacted for information regarding cultural resources that could be affected by the Project. The City provided notice of the Project via certified mail on March 5, 2025, to Native American tribal contacts provided by the NAHC as well as local Native American tribal representatives that previously requested to be notified of future projects proposed by the City in compliance with AB 52 and SB18.[70] The City received two letter responses one from the Yuhaaviatam of San Manuel Nation (San Manuel Nation) and one from the Gabrieleno Band of Mission Indians – Kizh Nation (Kizh Nation).

The City completed the tribal consultation process with both the Kizh Nation and the San Manuel Nation in accordance with Assembly Bill (AB) 52 and Senate Bill (SB) 18. As a result of this consultation and based on previously established measures by the City, Mitigation Measures (MM) **TCR-1** through **TCR-5** were developed to minimize potential impacts related to the unanticipated discovery of tribal cultural resources. No specific information regarding known tribal cultural resources on the Project site was provided to the City during the consultation process.

Tribal responses included MM's to address unanticipated tribal resources finds. **MM TCR-1, MM TCR-2, MM TCR-3, MM TCR-4, and MM TCR-5** were developed based on the tribal consultation process and previously agreed upon measures developed by the City to minimize potential impacts related to the unanticipated discovery of tribal cultural resources. **MM TCR-1** requires Native American tribal monitoring of ground-disturbing activities, if requested. **MM TCR-2, MM TCR-3, and MM TCR-4** outline the procedures to be followed if unanticipated tribal cultural resources are discovered during ground disturbing activities. In the event that human remains or funerary/ceremonial objects are encountered, during construction, **MM TCR-5** requires compliance with PRC 5097 and the State's Health and Safety Code Section 7050.5 for the proper treatment and handling of such remains or objects.

TCR-1 **Retain a Native American Monitor Prior to Commencement of Ground-Disturbing Activities**.

A. The City shall contact interested tribes to determine if a Native American Monitor is requested prior to the commencement of any "ground-disturbing activity" for the subject Project at all Project locations (i.e., both on-site and any off-site locations that are included in the Project description/definition and/or required in connection with the Project, such as public improvement work).

[70] Winter, Joshua, City of Upland. 2025. *Senate Bill 18 Consultation Letters for San Antonio Water Company Headquarters Project (GPA-24-0004) and Assembly Bill 52 Consultation Letters for the San Antonio Water Company Headquarters Project. March 5.*

"Ground-disturbing activity" shall include, but is not limited to, demolition, pavement removal, potholing, auguring, grubbing, tree removal, boring, grading, excavation, drilling, and trenching.

B. A copy of the executed monitoring agreement shall be submitted to the lead agency prior to the commencement of any ground-disturbing activity, or the issuance of any permit necessary to commence a ground-disturbing activity.

C. If monitoring is required, the monitor will complete daily monitoring logs that will provide descriptions of the relevant ground-disturbing activities, the type of construction activities performed, locations of ground-disturbing activities, soil types, cultural-related materials, and any other facts, conditions, materials, or discoveries of significance to the Tribe. Monitor logs will identify and describe any discovered TCRs, including but not limited to, Native American cultural and historical artifacts, remains, places of significance, etc., (collectively, tribal cultural resources, or "TCR"), as well as any discovered Native American (ancestral) human remains and burial goods. Copies of monitor logs will be provided to the Project applicant/lead agency upon written request to the Tribe.

D. On-site tribal monitoring shall conclude upon the latter of the following (1) written confirmation to the tribal representative from a designated point of contact for the Project applicant/lead agency that all ground-disturbing activities and phases that may involve ground-disturbing activities on the Project site or in connection with the Project are complete; or (2) a determination and written notification by the tribal representative to the Project applicant/lead agency that no future, planned construction activity and/or development/construction phase at the Project site possesses the potential to impact TCRs.

TCR-2 **Unanticipated Discovery of Tribal Cultural Resource Objects (Non-Funeral/Non-Ceremonial).**

The San Manuel Nation Cultural Resources Department shall be contacted of any pre-contact and/or historic-era cultural resources discovered during project implementation and be provided information regarding the nature of the find so as to provide tribal input with regards to significance and treatment. In the event the material is determined to be significant, Mitigation Measure TCR-4 shall apply.

TCR-3 **Unanticipated Discovery of Tribal Cultural Resource Objects (Non-Funeral/Non-Ceremonial).** Upon discovery of any TCRs, all construction activities in the immediate vicinity of the discovery shall cease (i.e., not less than the surrounding 50 feet) and shall not resume until the discovered TCR has been fully assessed by the Kizh monitor and/or Kizh archaeologist. In the event the material is determined to be significant, Mitigation Measure TCR-4 shall apply.

TCR-4 **Monitoring and Treatment Plan.** In the event of any inadvertent discovery of any tribal cultural material, or pre-contact/historic-era resource determined to be significant, the City shall require the preparation of a Monitoring and Treatment Plan. The monitoring and treatment plan shall be prepared by a qualified archeologist in consultation with and subject to the approval of the City and the consulting Native American tribes. The City and consulting Native American tribes shall engage in mutual good faith efforts to develop the Monitoring and Treatment Plan. The monitoring and treatment plan shall identify the manner and process in which any suspected tribal cultural material is evaluated, recorded, removed, or curated, including the final disposition of any such material.

If the manner and process of evaluation, recording, removing, and/or disposing of tribal cultural material cannot be resolved between consulting Native American parties, the City shall, in good faith, determine and approve the appropriate actions to be included in the Monitoring and Treatment Plan.

TCR-5 **Unanticipated Discovery of Human Remains and Associated Funerary or Ceremonial Objects**.

A. Native American human remains are defined in PRC 5097.98 (d)(1) as an inhumation or cremation, and in any state of decomposition or skeletal completeness. Funerary objects, called associated grave goods in Public Resources Code Section 5097.98, are also to be treated according to this statute.

B. If Native American human remains and/or grave goods are discovered or recognized on the Project site, then Public Resource Code 5097.9 as well as Health and Safety Code Section 7050.5 shall be followed.

C. Human remains and grave/burial goods shall be treated alike per California Public Resources Code section 5097.98(d)(1) and (2).

D. Preservation in place (i.e., avoidance) is the preferred manner of treatment for discovered human remains and/or burial goods.

E. Any discovery of human remains/burial goods shall be kept confidential to prevent further disturbance.

Based on the findings of the *Cultural Resources Assessment* completed for the Project and AB 52/SB 18 consultation, no known tribal cultural resources listed or eligible for listing in the California Register of Historical Resources (California Register) or in a local register exist within the Project site, and there are no known tribal cultural resources on the Project site. Therefore, the Project would not cause a substantial adverse change in the significance of a tribal cultural resource defined as a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American Tribe, and that is listed or eligible for listing in the California Register or in a local register of historical

resources as defined in PRC Section 5020.1(k). Nevertheless, implementation of **MM TCR-1, MM TCR-2, MM TCR-3, MM TCR-4,** and **MM TCR-5**, are required to address the potential impacts to unanticipated tribal cultural resources, human remains, and associated funerary or ceremonial objects, the implementation of which would reduce impacts to less than significant with mitigation incorporated.

ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1? In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe. ***(Less than Significant with Mitigation Incorporated)***

As noted above, a cultural resources record search, an SLF search through the NAHC, and AB 52 and SB18 Native American consultation were conducted for the Project. The purpose of these efforts was to identify known tribal cultural resources on or near the Project site. No on-site cultural resources were identified as part of the records search. The City conducted tribal consultation with the and San Manuel Nation and the Kizh Nation and **MM TCR-1**, **MM TCR-2**, **MM TCR-3, MM TCR-4,** and **MM TCR-5** were developed based on the tribal consultation process and previously agreed upon measures developed by the City to minimize potential impacts related to the discovery of unanticipated tribal cultural resources, human remains, and associated funerary or ceremonial objects.

Archaeological pedestrian field surveys of the Project site were conducted on July 8, 2024, and August 6, 2024, as part of the *Cultural Resources Assessment* completed for the Project. No cultural resources, including tribal cultural resources, were discovered within the Project site during the field survey. Furthermore, the parcel has been severely disturbed and the sensitivity for subsurface resources is low. Therefore, encountering unknown buried cultural resources, including tribal cultural resources, during Project construction is unlikely. However, in the unlikely event that unanticipated tribal cultural resources are discovered during construction of the Project, **MM TCR-2, MM TCR-3, and MM TCR-4** would be implemented, which require adherence to procedures for the treatment of unanticipated tribal cultural resources if discovered during construction. With implementation of **MM TCR-2**, **MM TCR-3**, and **MM TCR-4** potential impacts to previously unanticipated tribal cultural resources would be less than significant.

No human remains are documented/known to be on the Project site. Furthermore, the parcel has been severely disturbed and the sensitivity for subsurface resources is low. Therefore, the likelihood of discovering unknown human remains during construction of the Project is extremely low. However, in the unlikely event that human remains or funerary/ceremonial objects are discovered during construction of the Project and are of Native American origin, the Construction Contractor would be required to implement **MM TCR-5**, which requires compliance with PRC 5097 and the State's Health and Safety Code Section 7050.5 for the treatment of human remains or funerary/ceremonial objects. If human remains are Native American in origin, the remains may be considered a tribal cultural resource.

At the completion of Project construction, the Project would not result in further disturbance of native soils on the Project site and, therefore, Project operations would have no potential to impact previously undiscovered tribal cultural resources or human remains.

With implementation of **MM TCR-1**, **MM TCR-2, MM TCR-3, MM TCR-4,** and **MM TCR-5,** the Project would not cause a substantial adverse change in the significance of a tribal cultural resource defined as a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe that is determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. Impacts would be less than significant with mitigation incorporated.

4.19 UTILITIES AND SERVICE SYSTEMS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☒	☐
c) Result in a determination by the wastewater treatment provider which 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?	☐	☐	☒	☐
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☒	☐

a. Would the project require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects? ***(Less Than Significant Impact)***

The City of Upland owns and operates the local sewer lines within the City, and wastewater treatment is provided at reclamation facilities primarily owned and maintained by the Inland Empire Utilities Agency (IEUA). Except for areas within the southwestern-most portion of the City, the Upland community sewer system is a gravity-flow system, and therefore there are no public wastewater lift stations in the City. There are approximately 270 miles of wastewater conduits within the City of Upland. The major trunk lines, varying in size from 12 inches to 21 inches, are predominantly situated along the southern parts of the City. Laterals, generally 8-inch to 10-inch diameter, compose the remainder of the system.[71] The Project would include new on-site sanitary sewer lines that would be constructed and connected to existing nearby sanitary sewer main lines in conformance with City standards, and the Project's construction would not cause significant environmental effects.

The City of Upland owns and operates its own water distribution system and provides water service to almost all of the residential, commercial, and industrial users within the incorporated City limits, including the Project site. The City serves potable water to a population of 78,383 people through

[71] City of Upland. 2015a. *Final Program Environmental Impact Report General Plan Update (GPU 08-03), Zoning Code Update (ZCU 08-03), Climate Action Plan, and Cable Airport Land Use Compatibility Plan Update SCH No. 2012041006)*. September 28.

19,487 connections. The City's water supplies include imported water from Metropolitan Water District of Southern California (MWD) purchased through IEUA, groundwater pumped from City owned wells and West End Consolidated Water Company (WECWC), groundwater purchased from SAWCo, surface water purchased from SAWCo and treated by the City, and recycled water purchased from IEUA. The City updated its Urban Water Management Plan (UWMP) in 2020 and adopted the UWMP in 2021.[72] According to the UWMP, the annual water use in 2020 was 18,431 acre-feet. As discussed in Section 4.19.b, the Project would not substantially increase demand for water and would therefore not exceed the capacity of existing water treatment facilities. The Project would not require the construction of new water treatment facilities, or the expansion of existing facilities, other than those already planned. The Project would include new on-site water lines that would be constructed and connected to existing nearby water main lines in conformance with City standards, which have sufficient capacity to accommodate the Project. Therefore, the impact of the Project on water infrastructure would be less than significant.

The proposed storm drainage infrastructure would include new stormwater drains and catch basins that would be installed throughout the site, connecting to an infiltration basin and an underground storage infiltration system that would be used for stormwater control, treatment, and infiltration. On-site drainage would be designed in compliance with the requirements of the MS4 Permit as detailed in Section 4.10, Hydrology and Water Quality. Therefore, the impact of the Project on stormwater infrastructure would be less than significant.

Electrical power is provided to the Project site and surrounding area by the Southern California Edison company. The Project would connect to existing overhead electricity lines along East 20th Street. There would be no changes to the existing telecommunications facilities.

The City does not allow the use of natural gas; therefore, natural gas is not proposed as part of the Project.

Therefore, because the Project would connect to existing utility services within or adjacent to the Project site and there is sufficient excess capacity within those systems to accommodate Project demands, the relocation or reconstruction of new or expanded water, wastewater treatment or stormwater drainage, electric power, or telecommunications facilities would not be required, and this impact would be less than significant.

b. Would the project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years? ***(Less Than Significant Impact)***

As noted above, the City provides water service to the Project site. As previously discussed, the City's potable water supply is sourced from imported water from MWD purchased through IEUA, groundwater pumped from City wells and WEWC, and groundwater and surface water purchased from SAWCo. The City's 2020 UWMP describes the existing and planned sources of water available

[72] City of Upland. 2021. *City of Upland 2020 Urban Water Management Plan and Water Shortage Contingency Plan*. June.

in the water system service area over the next 20 years, in 5-year increments. The 2020 UWMP indicates the City has sufficient water supplies to meet water demands through 2045, including during multiple dry years. The UWMP, which identifies water system improvements necessary to meet future water demand, did not identify any deficiencies in the vicinity of the Project site. The existing water system infrastructure has adequate capacity to serve the Project and the anticipated water use of the Project would not be significantly higher than the water demand of the Project site under existing conditions. In addition, the Project would be required to coordinate with the San Bernardino County Fire Protection District (SBCFPD) to assess fire flow requirements and comply with them as part of the Project. Based on the above, the City would have sufficient water supply to support the Project during normal, dry, and multiple dry years, and implementation of the Project would not require new or expanded entitlements for water supplies, and impacts related to water supply would be less than significant.

c. Would the project result in a determination by the wastewater treatment provider which 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? ***(Less Than Significant Impact)***

As discussed above, wastewater treatment is provided at reclamation facilities primarily owned and maintained by the IEUA. Wastewater from the Project site would be treated at the IEUA Regional Water Reclamation Facility 1 (RP-1). RP-1 is located in the City of Ontario and was originally commissioned in 1948. The plant has undergone several expansions to increase the design wastewater treatment capacity to the current 44 million gallons per day (mgd). This facility serves the cities of Chino, Ontario, Rancho Cucamonga, Upland, Montclair, Fontana and an unincorporated area of San Bernardino County. The plant treats an average influent wastewater flow of approximately 28 million gallons per day, which is approximately 64 percent of its 44 mgd capacity.[73]

Sinks and toilets that would serve the employees at the Project site would generate domestic wastewater, which would be treated by IEUA's RP-1. However, considering the treatment plant only treats an average of approximately 64 percent of its capacity on a daily basis, it would be able to adequately accommodate wastewater generated by the Project. Therefore, wastewater generated from the Project would not cause the IEUA to violate any wastewater treatment requirements, and this impact would be less than significant.

d. Would the project generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals? ***(Less Than Significant Impact)***

Burrtec Waste Industries, Inc. provides solid waste collection to the City of Upland for residential, commercial and industrial waste services, recycling services, and composting. Solid waste from the City is transferred to the West Valley Transfer Station/Material Recovery Facility in Fontana before being distributed to various landfills within San Bernardino County. The majority of waste from Upland is disposed of at the Mid-Valley Sanitary Landfill, Badlands Sanitary Landfill, and El Sobrante

[73] IEUA. 2024. *Regional Water Recycling Plant No. 1.* Website: https://www.ieua.org/regional-water-recycling-plant-no-1/ (accessed July 10, 2024).

Landfill.[74] The Mid-Valley Sanitary Landfill has a maximum permitted daily disposal rate of 7,500 tons of solid waste, a remaining capacity of 54,219,377 cubic yards, and an anticipated closure date of 2045.[75] The Badlands Sanitary Landfill has a maximum permitted daily disposal rate of 5,000 tons of solid waste, a remaining capacity of 7,800,000 cubic yards, and an anticipated closure date of 2059.[76] The El Sobrante Landfill has a maximum permitted daily disposal rate of 16,054 tons of solid waste, a remaining capacity of 209,910,000 cubic yards, and an anticipated closure date of 2051.[77]

Based on a generation rate of 1.24 pounds per employee per day,[78] the Project would generate approximately 12.4 pounds of solid waste per day. As noted above, the Mid-Valley Sanitary Landfill, Badlands Sanitary Landfill, and El Sobrante Landfill have adequate capacity to serve the Project. As such, the Project would be served by a landfill with sufficient capacity to accommodate the Project's waste disposal needs. Furthermore, the Project would comply local and State west reduction strategies. Therefore, impacts associated with the disposition of solid waste would be less than significant.

e. Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste? ***(Less Than Significant Impact)***

The Project would comply with all federal, State, and local solid waste statutes and/or regulations related to solid waste and, as noted above, the Mid-Valley Sanitary Landfill, Badlands Sanitary Landfill, and El Sobrante Landfill have adequate capacity to serve the Project. Therefore, the Project would result in a less than significant impact related to solid waste regulations.

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74 City of Upland. 2015a. *Final Program Environmental Impact Report General Plan Update (GPU 08-03), Zoning Code Update (ZCU 08-03), Climate Action Plan, and Cable Airport Land Use Compatibility Plan Update SCH No. 2012041006)*. September 28.

75 California Department of Resources Recycling and Recovery (CalRecycle). 2019a. *SWIS Facility/Site Activity Details, Mid-Valley Sanitary Landfill (36-AA-0055).* Website: https://www2.calrecycle.ca.gov/SolidWaste/SiteActivity/Details/1880?siteID=2662 (accessed July 10, 2024).

76 CalRecycle. 2019b. *SWIS Facility/Site Activity Details, Badlands Sanitary Landfill (33-AA-0006).* Website: https://www2.calrecycle.ca.gov/SolidWaste/SiteActivity/Details/2245?siteID=2367 (accessed July 10, 2024).

77 CalRecycle. 2019c. *SWIS Facility/Site Activity Details, El Sobrante Landfill (33-AA-0217).* Website: https://www2.calrecycle.ca.gov/SolidWaste/SiteActivity/Details/2280?siteID=2402 (accessed July 10, 2024).

78 CalRecycle. n.d. *Estimated Solid Waste Generation Rates*. Website: https://www2.calrecycle.ca.gov/wastecharacterization/general/rates (accessed July 10, 2024).

4.20 WILDFIRE

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☒	☐
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☒	☐
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☒	☐

a. Would the project substantially impair an adopted emergency response plan or emergency evacuation plan? ***(Less Than Significant Impact)***

The Project site is not located within or near a State Responsibility Area (SRA) for fire service and is not located in a Very High Fire Hazard Severity Zone (VHFHSZ).[79] An SRA VHFHSZ is located approximately 1.5 miles north the Project site. The Project would be designed to provide adequate access to the site for fire/police/emergency medical service personnel in the event of an emergency at the Project site. The improvements that would occur as part of the Project are site-specific and do not include any public right-of-way improvements to off-site areas (e.g., roadway improvements, intersection improvements). The Project would not reduce the number of traffic lanes on any adjacent streets and would not alter the existing street grid, and; therefore, it would not alter or obstruct emergency evacuation routes or response plan. The Project site would be accessible to emergency vehicles in the event a hazardous event occurs on the site. Overall, the Project does not include any features that would impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; therefore, this impact would be less than significant.

[79] Office of the State Fire Marshal. 2024 Fire Hazard Severity Zones. Website: https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/fire-hazard-severity-zones (accessed April 22, 2025).

b. Would the project, due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire? ***(Less Than Significant Impact)***

As described above, the Project is not located in a VHFHSZ or in an SRA. Additionally, as noted in Chapter 2.0, Project Description, the Project site is generally level and is primarily surrounded by existing development. Furthermore, the Project would not include any design features that would increase the potential for a wildfire. Therefore, the Project would not exacerbate wildfire risks and thereby expose Project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire, and this impact would be less than significant.

c. Would the project require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment? ***(Less Than Significant Impact)***

As described above, the Project is not located in a VHFHSZ or in an SRA. The Project includes the construction of a new 3,698-square-foot SAWCo headquarters and associated improvements including a 4,066-square-foot maintenance building, maintenance yard, driveway, parking, solar cover, landscaping, and utility improvements. In the absence of any significant potential for on-site or adjacent wildfire hazard, the Project would not need to incorporate fire protection infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other non-existing utilities) that may themselves exacerbate fire risk. Installation of all Project-related utility improvements would be implemented in an urbanized setting in accordance with the current California Building Code, California Fire Code, and applicable local ordinances. Therefore, impacts related to the installation or maintenance of infrastructure that may exacerbate fire risk or result in temporary or ongoing impacts would be less than significant.

d. Would the project expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes? ***(Less Than Significant Impact)***

Landslides. Landslides and other forms of mass wasting, including mud flows, debris flows, and soil slips, occur as soil moves downslope under the influence of gravity. Landslides are frequently triggered by intense rainfall or seismic shaking but can also occur as a result of erosion and downslope runoff caused by rain following a fire. As previously discussed in Section 4.7.a.iv, the Project site is not located in an area at risk of landslide. Further, as stated previously, the Project site is not located in a VHFHSZ, or in or near an SRA. In the unlikely event that a wildfire should spread to the Project site, it would not expose any on-site slopes to erosion and potential failure because the Project site does not contain any steep slopes that are prone to landslide. The Project would not expose people or structures to significant risks, including downslope landslides, as a result of runoff, post-fire slope instability, or drainage changes. There would be no impact to Project occupants or nearby residents or workers related to post-wildfire landslide risks, and no mitigation would be required.

Flooding. According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) No. 06071C7870J, the Project site is located in Zone X, which is identified as an area of minimal flood hazard.[80] In the unlikely event that a wildfire should spread to the Project site, it is not expected that the Project would contribute any additional runoff or sedimentation downstream drainages. This is due to the lack of steep slopes that are prone to landslide or erosion on the Project site and the fact that the Project's drainage improvements would manage the rate and volume on-site runoff and reduce the potential for flooding conditions in downstream storm drain facilities. Therefore, downslope or downstream flooding as a result of runoff, post-fire slope instability, or drainage changes are unlikely to expose occupants or structures to significant risks. Impacts to Project occupants related to post-wildfire flooding risks would be less than significant, and no mitigation is required.

[80] FEMA. 2016. Flood Insurance Rate Map No. 06071C7870J. Map Revised September 2, 2016. Website: https://msc.fema.gov/portal/search (accessed July 5, 2024).

4.21 MANDATORY FINDINGS OF SIGNIFICANCE

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Have the potential to substantially 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) 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) Have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

a. Would the project have the potential to substantially 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? ***(Less Than Significant with Mitigation Incorporated)***

The Project site does not contain suitable habitat for any federal or State-listed plant, animal, or aquatic species. Additionally, the Project site does not contain any sensitive habitats, including any United States Fish and Wildlife Service (USFWS) designated Critical Habitat for any federally-listed species, or California Department of Fish and Wildlife (CDFW) special-status natural communities. However, burrowing owls, a non-listed State species of special concern, have a low to moderate probability of occurrence within the Project site. To avoid impacts to burrowing owls, **Mitigation Measure (MM) BIO-1** would be required, which entails the completion of burrowing owl clearance surveys. Additionally, there are trees adjacent to and within the Project site that could provide nesting habitat for common birds and raptors protected under the Migratory Bird Treaty Act (MBTA) and the California Fish and Game Code. To comply with the MBTA and the California Fish and Game Code and avoid impacts to nesting birds from implementation of the Project, a pre-construction nesting bird survey would be required prior to construction activities and vegetation removal, as detailed in **MM BIO-2.** With implementation of **MM BIO-1** and **MM BIO-2**, potential impacts to biological resources would be less than significant.

Based on the results of the cultural records search, the only historic-period (50 years of age or older) resource that was identified in the Project area is a concrete water reservoir that was built in 1930

as part of the irrigation system for nearby citrus groves. The reservoir was evaluated for historical significance using the criteria for listing in the California Register of Historical Resources and designation as a City Cultural Resource and did not meet any of the State or local criteria. Therefore, it is not considered a historical resource pursuant to Section 15064.5 of the *State CEQA Guidelines,* and implementation of the Project would not result in impacts to historical resources. Although no archaeological resources were found on the Project site, ground-disturbing activities have the potential to reveal unknown buried deposits. In the unlikely event that unanticipated archaeological resources are discovered at any time during Project construction, impacts to these resources could be potentially significant. Therefore, **MM CUL-1** would be implemented, which requires that a qualified archaeologist be retained on-call to respond to inadvertent discoveries during Project construction and that all construction work occurring within 50 feet of any find shall immediately stop until a qualified archaeologist, meeting the Secretary of the Interior's Qualification Standards for Archaeology, can evaluate the significance of the find. Although no human remains are known to be on the Project site or are anticipated to be discovered during Project construction, there is always a possibility of encountering unanticipated cultural resources, including human remains, during construction activities. In the event that human remains are discovered during construction activities, **MM CUL-2** would be implemented, which requires compliance with the State's Health and Safety Code for the treatment of human remains. Additionally, in the unlikely event that fossils of any sort are discovered during grading/earthmoving activities, **MM GEO-1** would be implemented to reduce potential impacts to paleontological resources. With implementation of **MMs CUL-1, CUL-2, and GEO-1,** potential impacts associated with important examples of the major periods of California history or prehistory would be less than significant with mitigation incorporated.

With incorporation of **MMs BIO-1, BIO-2, CUL-1, CUL-2, and GEO-1**, the Project would not substantially 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, and impacts would be less than significant with mitigation incorporated.

b. Would 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 with Mitigation Incorporated)***

Based on the analysis provided throughout this IS/MND, the Project would have either no impact, a less than significant impact, or a less than significant impact with mitigation incorporated with respect to all environmental issues pursuant to CEQA. Furthermore, due to the limited scope of direct physical impacts to the environment associated with the Project, the Project's impacts are primarily Project-specific in nature.

Implementation of the Project has the potential to result in effects to the environment that are individually limited and may be cumulatively considerable in the following areas: Biological Resources, Cultural Resources, Geology and Soils, and Tribal Cultural Resources. As shown in the

discussion above, environmental effects associated with the Project can be reduced to less than significant levels through implementation of Project-specific mitigation measures or existing regulations. Therefore, with incorporation of the mitigation measures and existing regulations discussed throughout this IS/MND, the Project would not contribute to environmental effects that are individually limited, but cumulatively considerable. Impacts would be less than significant with mitigation incorporated.

c. Would the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly? ***(Less Than Significant with Mitigation Incorporated)***

Based on the analysis provided throughout this IS/MND, with incorporation of mitigation measures and regulatory compliance measures, the Project would not result in any environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly. Potential impacts on human beings would be less than significant with mitigation incorporated.

5.0 LIST OF PREPARERS

LSA Associates, Inc.
3210 El Camino Real, Suite 100
Irvine, CA 92602

Amanda Durgen, Principal Environmental Planner
Dena Giacomini, Project Manager
Ashley Honer, Environmental Planner
Ronald Brugger, Senior Air Quality Specialist
Amber Hazelrigg, Greenhouse Gas/Climate Change Analyst
Jessica Coria, Associate/Director of Air Quality and Climate Change
Mohammad Abushanab, Mechanical Noise Engineer
Casey Tibbet, Associate Architectural Historian
Rory Goodwin, Associate Archaeologist
Cassidy Sharp, Archaeologist
Chrissy Kent, Biologist
Jenna Wedworth, Assistant Biologist
Ambarish Mukherjee, Mobility Principal
Kimberly Cervantes, Transportation Engineer
Kenneth Tan, Senior Transportation Engineer
Vyshnavi Shetty, Transportation Planner/Engineer
Jessie Quigley, GIS Specialist/Programmer
Meredith Canterbury, Associate GIS Specialist
Jason Thomas, Graphics Specialist
Matt Phillips, Graphics and Production
Lauren Johnson, Senior Technical Editor
Chantik Virgil, Senior Word Processor

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MITIGATION MONITORING AND REPORTING PROGRAM

This Mitigation Monitoring and Reporting Program (MMRP) is formulated based upon the findings of the Initial Study/Mitigated Negative Declaration (IS/MND) prepared for the San Antonio Water Company (SAWCo) Headquarters Project (Project). The MMRP, which is found in Table 1, lists mitigation measures recommended in the IS/MND prepared for the Project and identifies mitigation monitoring requirements. The Final MMRP must be adopted when the City of Upland (City) makes a final decision on the Project.

This MMRP has been prepared to comply with the requirements of State law (Public Resources Code Section 21081.6). State law requires the Lead Agency to adopt an MMRP when mitigation measures are required to avoid significant impacts. The MMRP is intended to ensure compliance with the mitigation measures identified in the IS/MND during implementation of the Project.

The MMRP is organized in a matrix format. The first two columns identify the potential impacts and corresponding mitigation measures. The third column, entitled "Timeframe for Implementation," refers to when monitoring will occur to ensure that the mitigating action is completed. The fourth column, entitled "Responsibility for Implementation," refers to the party responsible for implementing the mitigation measure. The fifth column, entitled, "Oversight of Implementation," refers to the party responsible for oversight or ensuring that the mitigation measure is implemented.

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Mitigation Monitoring and Reporting Program

Impact	Mitigation Measures	Timeframe for Implementation	Responsibility for Implementation	Oversight of Implementation
4.4 Biological Resources				
The Project could have a substantial adverse effect, either directly or through habitat modifications, on burrowing owls.	**MM BIO-1: Burrowing Owl Clearance Survey.** Fourteen days prior to the commencement of Project activities, a qualified biologist will conduct a Presence/Absence survey of suitable habitat on the Project site as well as survey for signs of scat/burrow usage. If burrowing owls/active burrows are directly observed within the Project site during the preconstruction survey, a suitable buffer will be placed around the active burrow as determined by a qualified biologist and avoided until the individuals leave of their own accord. Additionally, if burrowing owl is found during the preconstruction survey, the Project proponent will need to inform the California Department of Fish and Wildlife (CDFW) and the United States Fish and Wildlife Service (USFWS) and prepare a Burrowing Owl Protection and Relocation Plan for approval by these agencies prior to initiating ground disturbance.	Fourteen days prior to the commencement of Project activities Prior to initiating ground disturbance	Project Proponent/ Qualified Biologist	City of Upland Director of Planning Services, or designee
The Project could have a substantial adverse effect, either directly or through habitat modifications, on native birds protected under the Migratory Bird Treaty Act.	**MM BIO-2: Nesting Bird Clearance Survey.** The Project's construction activities will occur, if feasible, between September 16 and January 31 (outside of nesting bird season) in an effort to avoid impacts to nesting birds. If activities must occur within nesting bird season (February 1 to September 15), a qualified biologist will conduct a pre-construction survey no more than 3 days (72 hours) prior to any construction activities and vegetation removal. Should nesting birds be found, an exclusionary buffer will be established by the qualified biologist. The buffer will be clearly marked in the field by construction personnel under guidance of the qualified biologist. No construction activities will be allowed within this zone until the qualified biologist determines that the young have fledged, or the nest is no longer active. To the greatest extent feasible, tree trimming/removal activities will be performed outside of the nesting season for birds (February 1–September 15). If trimming or removal of trees during the nesting bird season cannot be avoided, a qualified biologist will monitor tree trimming and removal activities, if nests are found present during the pre-construction survey.	Prior to any construction activities and vegetation removal During construction activities	Project Proponent/ Qualified Biologist/ Construction Contractor	City of Upland Director of Planning Services, or designee

Mitigation Monitoring and Reporting Program

Impact	Mitigation Measures	Timeframe for Implementation	Responsibility for Implementation	Oversight of Implementation
4.5 Cultural Resources				
The Project could cause a substantial adverse change in the significance of an unidentified archaeological resource if such resources are encountered during construction.	**MM CUL-1: Unknown Archaeological Resources.** In the event that archaeological resources are discovered during excavation, grading, or construction activities, work shall cease within 50 feet of the find until a qualified archaeologist from the San Bernardino County List of Qualified Archaeologists has evaluated the find in accordance with federal, State, and local guidelines to determine whether the find constitutes a "unique archaeological resource," as defined in Section 21083.2(g) of the California Public Resources Code (PRC). Personnel of the Project shall not collect or move any archaeological materials and associated materials. Construction activity may continue unimpeded on other portions of the Project site. The found deposits shall be treated in accordance with federal, State, and local guidelines, including those set forth in PRC Section 21083.2. Prior to issuance of a grading permit, the Director of Planning Services, or designee, shall ensure that this mitigation measure is documented on the grading plans.	During excavation, grading, or ground-disturbing construction activities	Project Proponent/ Qualified Archaeologist/ Construction Contractor	City of Upland Director of Planning Services, or designee
The Project could disturb human remains if such resources are encountered during construction.	**MM CUL-2: Human Remains.** If human remains are encountered, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to State Public Resources Code (PRC) Section 5097.98. The County Coroner must be notified of the find immediately. If the remains are determined to be Native American, the County Coroner would notify the Native American Heritage Commission (NAHC), which would determine and notify a Most Likely Descendant (MLD). With the permission of the landowner or his/her authorized representative, the MLD may inspect the site of the discovery. The MLD shall complete the inspection and make recommendations or preferences for treatment within 48 hours of being granted access to the site. The MLD recommendations may include scientific removal and nondestructive analysis of human remains and items associated with Native American burials, preservation of Native American human remains and associated grave goods in place, relinquishment of Native American human remains and associated items to the descendants for treatment, or any other culturally appropriate treatment. Prior to issuance of a grading permit, the Director of Planning Services or designee shall ensure that this mitigation measure is documented on the grading plans.	During excavation, grading, or ground-disturbing construction activities	Project Proponent/ County Coroner/ Construction Contractor	City of Upland Director of Planning Services, or designee

Mitigation Monitoring and Reporting Program

Impact	Mitigation Measures	Timeframe for Implementation	Responsibility for Implementation	Oversight of Implementation
4.7 Geology and Soils				
The Project could directly or indirectly destroy a unique paleontological resource or site or unique geologic feature if encountered during construction.	**MM GEO-1: Paleontological Resources Impact Mitigation Program.** Should paleontological resources be encountered during Project subsurface construction activities, all ground-disturbing activities within 25 feet shall be redirected and a qualified paleontologist contacted to assess the situation, consult with agencies as appropriate, and make recommendations for the treatment of the discovery. For purposes of this mitigation, a "qualified paleontologist" shall be an individual with the following qualifications: (1) a graduate degree in paleontology or geology and/or a person with a demonstrated publication record in peer-reviewed paleontological journals; (2) at least two years of professional experience related to paleontology; (3) proficiency in recognizing fossils in the field and determining their significance; (4) expertise in local geology, stratigraphy, and biostratigraphy; and (5) experience collecting vertebrate fossils in the field. If the paleontological resources are found to be significant and Project activities cannot avoid them, measures shall be implemented to ensure that the Project does not cause a substantial adverse change in the significance of the paleontological resource. Measures may include monitoring, recording the fossil locality, data recovery and analysis, a final report, and accessioning the fossil material and technical report to a paleontological repository. Upon completion of the assessment, a report documenting methods, findings, and recommendations shall be prepared and submitted to the City of Upland for review. If paleontological materials are recovered, this report also shall be submitted to a paleontological repository such as the University of California Museum of Paleontology, along with significant paleontological materials. Public educational outreach may also be appropriate.	During excavation, grading, or ground-disturbing construction activities	Project Proponent/ Qualified Paleontologist/ Construction Contractor	City of Upland Director of Planning Services, or designee
4.18 Tribal Cultural Resources				
The Project could disturb tribal cultural resources if such resources are encountered during construction.	**MM TCR-1: Retain a Native American Monitor Prior to Commencement of Ground-Disturbing Activities.** A. The City shall contact interested tribes to determine if a Native American Monitor is requested prior to the commencement of any "ground-disturbing activity" for the subject Project at all Project locations (i.e., both on-site and any off-site locations that are included in the Project description/definition and/or required in connection with the Project, such as public improvement work). "Ground-disturbing activity" shall include,	During excavation, grading, or ground-disturbing construction activities	Project Proponent/ Native American Monitor	City of Upland Director of Planning Services, or designee

Mitigation Monitoring and Reporting Program

Impact	Mitigation Measures	Timeframe for Implementation	Responsibility for Implementation	Oversight of Implementation
	but is not limited to, demolition, pavement removal, potholing, auguring, grubbing, tree removal, boring, grading, excavation, drilling, and trenching. B. A copy of the executed monitoring agreement shall be submitted to the lead agency prior to the commencement of any ground-disturbing activity, or the issuance of any permit necessary to commence a ground-disturbing activity. C. If monitoring is required, the monitor will complete daily monitoring logs that will provide descriptions of the relevant ground-disturbing activities, the type of construction activities performed, locations of ground-disturbing activities, soil types, cultural-related materials, and any other facts, conditions, materials, or discoveries of significance to the Tribe. Monitor logs will identify and describe any discovered TCRs, including but not limited to, Native American cultural and historical artifacts, remains, places of significance, etc., (collectively, tribal cultural resources, or "TCR"), as well as any discovered Native American (ancestral) human remains and burial goods. Copies of monitor logs will be provided to the Project applicant/lead agency upon written request to the Tribe. D. On-site tribal monitoring shall conclude upon the latter of the following (1) written confirmation to the tribal representative from a designated point of contact for the Project applicant/lead agency that all ground-disturbing activities and phases that may involve ground-disturbing activities on the Project site or in connection with the Project are complete; or (2) a determination and written notification by the tribal representative to the Project applicant/lead agency that no future, planned construction activity and/or development/construction phase at the Project site possesses the potential to impact TCRs.			
The Project could disturb non-funeral/non-ceremonial tribal cultural resources if such resources are encountered during construction.	**MM TCR-2: Unanticipated Discovery of Tribal Cultural Resource Objects (Non-Funeral/Non-Ceremonial).** The San Manuel Nation Cultural Resources Department shall be contacted of any pre-contact and/or historic-era cultural resources discovered during project implementation and be provided information regarding the nature of the find so as to provide tribal input with regards to significance and treatment. In the event the material is determined to be significant, Mitigation Measure TCR-4 shall apply.	During excavation, grading, or ground-disturbing construction activities	Project Proponent/ Native American Monitor/ Construction Contractor	City of Upland Director of Planning Services, or designee

Mitigation Monitoring and Reporting Program

Impact	Mitigation Measures	Timeframe for Implementation	Responsibility for Implementation	Oversight of Implementation
The Project could disturb non-funeral/non-ceremonial tribal cultural resources if such resources are encountered during construction.	**MM TCR-3: Unanticipated Discovery of Tribal Cultural Resource Objects (Non-Funeral/Non-Ceremonial).** Upon discovery of any TCRs, all construction activities in the immediate vicinity of the discovery shall cease (i.e., not less than the surrounding 50 feet) and shall not resume until the discovered TCR has been fully assessed by the Kizh monitor and/or Kizh archaeologist. In the event the material is determined to be significant, Mitigation Measure TCR-4 shall apply.	During excavation, grading, or ground-disturbing construction activities	Project Proponent/ Native American Monitor/ Construction Contractor	City of Upland Director of Planning Services, or designee
The Project could disturb tribal cultural resources if such resources are encountered during construction.	**MM TCR-4: Monitoring and Treatment Plan.** In the event of any inadvertent discovery of any tribal cultural material, or pre-contact/historic-era resource determined to be significant, the City shall require the preparation of a Monitoring and Treatment Plan. The monitoring and treatment plan shall be prepared by a qualified archeologist in consultation with and subject to the approval of the City and the consulting Native American tribes. The City and consulting Native American tribes shall engage in mutual good faith efforts to develop the Monitoring and Treatment Plan. The monitoring and treatment plan shall identify the manner and process in which any suspected tribal cultural material is evaluated, recorded, removed, or curated, including the final disposition of any such material. If the manner and process of evaluation, recording, removing, and/or disposing of tribal cultural material cannot be resolved between consulting Native American parties, the City shall, in good faith, determine and approve the appropriate actions to be included in the Monitoring and Treatment Plan.	During excavation, grading, or ground-disturbing construction activities	Project Proponent/ Qualified Archeologist/ Consulting Native American Tribes	City of Upland Director of Planning Services, or designee
The Project could disturb tribal human remains and associated funerary or ceremonial objects if such resources are encountered during construction.	**MM TCR-5: Unanticipated Discovery of Human Remains and Associated Funerary or Ceremonial Objects.** A. Native American human remains are defined in PRC 5097.98 (d)(1) as an inhumation or cremation, and in any state of decomposition or skeletal completeness. Funerary objects, called associated grave goods in Public Resources Code Section 5097.98, are also to be treated according to this statute. B. If Native American human remains and/or grave goods are discovered or recognized on the Project site, then Public Resource Code 5097.9 as well as Health and Safety Code Section 7050.5 shall be followed. C. Human remains and grave/burial goods shall be treated alike per California	During excavation, grading, or ground-disturbing construction activities	Project Proponent/ Native American Monitor/ Construction Contractor	City of Upland Director of Planning Services, or designee

Mitigation Monitoring and Reporting Program

Impact	Mitigation Measures	Timeframe for Implementation	Responsibility for Implementation	Oversight of Implementation
	Public Resources Code section 5097.98(d)(1) and (2). D. Preservation in place (i.e., avoidance) is the preferred manner of treatment for discovered human remains and/or burial goods. E. Any discovery of human remains/burial goods shall be kept confidential to prevent further disturbance.			

Source: LSA 2025.

APPENDIX A

AIR QUALITY AND GREENHOUSE GAS TECHNICAL MEMORANDUM

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CARLSBAD
CLOVIS
IRVINE
LOS ANGELES
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROSEVILLE
SAN LUIS OBISPO

MEMORANDUM

DATE: November 19, 2024

TO: Brian Lee, General Manager, San Antonio Water Company

FROM: Ronald Brugger, Senior Air Quality Specialist, LSA Associates, Inc.

SUBJECT: Air Quality and Greenhouse Gas Technical Memorandum for the Proposed San Antonio Water Headquarters in Upland, California (LSA Project No. 20241723)

INTRODUCTION

LSA has prepared this Air Quality and Greenhouse Gas Technical Memorandum to evaluate the impacts associated with the construction and operation of the San Antonio Water Company (SAWCO) Headquarters Project (project) in Upland, California. This analysis was prepared using methods and assumptions recommended in the air quality impact assessment guidelines of the South Coast Air Quality Management District (SCAQMD) in its *CEQA Air Quality Handbook* and associated updates.[1] This analysis includes an assessment of criteria pollutant emissions and an assessment of the project's greenhouse gas (GHG) emissions.

PROJECT LOCATION

The approximately 4.92-acre project site is located at 400 East 20th Street in Upland, San Bernardino County (Assessor's Parcel Number 1044-091-22). The project site is located in northwest Upland in an area primarily consisting of residential, commercial, and industrial uses. The project site is bound by East 20th Street to the north, undeveloped open space to the east, State Route 210 (SR 210) to the south, and Flower Court to the west. The project location is shown on Figure 1 (all figures are provided in Attachment A).

PROJECT DESCRIPTION

The project would result in the construction of a new 3,698-square-foot SAWCO headquarters and associated improvements, including a 4,066-square-foot maintenance building, maintenance yard, driveway, parking, solar cover, landscaping, and utility improvements, as shown on Figure 2. The headquarters building would feature office space, meeting and conference rooms, a lobby, an archive room, a break room, two Americans with Disabilities Act (ADA) restrooms, a quiet room, a copy room, and a work area. The maintenance building would include storage space, an outdoor

[1] South Coast Air Quality Management District (SCAQMD). 1993. *CEQA Air Quality Handbook.* Website: www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/ceqa-air-quality-handbook-(1993) (accessed November 2024).

welding area, a motor repair room, electrical rooms, an ADA restroom, a locker room, and a maintenance office/break room. The buildings would not use any natural gas (all electric), be a maximum height of 23 feet, and have a Floor Area Ratio of 0.7. It is anticipated that approximately 10 people would be employed on the project site.

The project would include a citrus grove buffer along the eastern half of the northern property line, along with various trees and shrubs around the parking areas and the main headquarters building. Approximately 46,077 square feet of landscaped area would be provided. Up to two of the existing street trees would be removed to accommodate the driveway off East 20th Street, and various shrubs and associated grassland would be removed to accommodate the driveway off Campus Avenue and East 20th Street. The three existing trees at the southwestern corner of the project site would remain in place, and 51 new ornamental trees and 64 new citrus trees would be planted as part of the project's landscape design.

The visitor and customer parking lot would be located south of the citrus grove and north of the main headquarters building and would provide 14 surface parking spaces, including two ADA compliant parking spots. The employee parking area would be located east of the main headquarters building, would be covered by photovoltaic panels, and would include 14 surface parking spaces, including 2 ADA compliant parking spots. The project would also provide 8 covered truck parking spots west of the maintenance building.

Existing developments include a 1-million-gallon water storage tank located at the northwestern corner of the parcel, a pump station located at the southwestern corner of the parcel, and a signal building and tower located at the southeastern corner of the parcel. Approximately five SAWCO employees within the Operations Department use the project site on a daily basis for equipment and material storage. The existing water storage tank, pump station, and signal buildings and tower would remain in place.

The proposed use is not currently consistent with the existing Single-Family Residential Low (SFR-L) General Plan land use designation and RS-10 zoning. To comply with the City of Upland's (City) General Plan and zoning regulations, the project will require a General Plan amendment, and a zone change to Public Utilities (PU) land use designation and Public/Institutional (PB/I) zoning. The PU designation accommodates landfills, flood control/recharge facilities, and public utilities, including gas, electricity, and water. The purpose of the PB/I zone is to allow for public and quasi-public facilities that serve Upland residents and visitors. The PU designation and PB/I zone permit a maximum Floor Area Ratio of 0.5.

Construction of the project is anticipated to begin in Spring 2025 and be completed by the end of 2026. The proposed project would require approximately 1,700 tons of roadway debris to be removed from the site and approximately 900 cubic yards of soil to be imported to the site. No natural gas would be used during construction.

EXISTING LAND USES IN THE PROJECT AREA

As shown in Figure 3, the project site is generally surrounded by a mix of residential, commercial, and industrial uses. To the north, the project site is bound by East 20th Street, across which are

single-family residential uses. The project site is immediately bound to the east by undeveloped open space owned by Southern California Edison Company. Further east are commercial and industrial uses, including a concrete supplier and gravel mine. To the south, the project site is bound by SR 210, across which are two large water storage tanks, single-family residential uses, and commercial uses. To the west, the project site is bound by Flower Court, across which are single-family residential uses.

For the purposes of this analysis, sensitive receptors are areas of population that have an increased sensitivity to air pollution or environmental contaminants. Sensitive receptor locations include residences, schools, daycare centers, hospitals, parks, and similar uses which are sensitive to air quality. Impacts on sensitive receptors are of particular concern because they are the population most vulnerable to the effects of air pollution.

The nearest sensitive receptors are the existing single-family residences to the west approximately 90 feet from the proposed project boundary. Although the majority of the construction activities would occur in the eastern half of the proposed project site much further from these residences, this analysis assumes that at some point construction equipment could operate along the western boundary of the project site. As the proposed project's operational emissions would occur in the eastern portion of the project site around the proposed buildings, the closest sensitive receptors to these emissions are the existing single-family residences to the north approximately 300 feet from the centroid of the operational area. Table A summarizes the distance of sensitive receptors to the proposed project by impact categories.

Table A: Summary of Analysis Distances by Impact Category

Activity	Nearest Sensitive Receptor	Points of Analysis	Distance (feet)
Construction[1]	Single-family homes along Flower Court	Perimeter of construction activities to centroid of nearest residence.	90
Operations	Single-family homes along East 20th Street	Emissions sources on site generalized at the centroid of the project site to centroid of nearest residence.	300

Source: Compiled by LSA (2024).

[1] Distance for construction air quality impact potential includes the assumption that heavy construction equipment would operate adjacent to the proposed project boundary, which is approximately 90 feet from the center of the nearest off-site structures where a person would live.

ENVIRONMENTAL SETTING

Air Quality Background

Air quality is primarily a function of local climate, local sources of air pollution, and regional pollution transport. The amount of a given pollutant in the atmosphere is determined by the amount of the pollutant released and the atmosphere's ability to transport and dilute the pollutant. The major determinants of transport and dilution are wind, atmospheric stability, terrain, and, for photochemical pollutants, sunshine.

A region's topographic features have a direct correlation with air pollution flow and therefore are used to determine the boundary of air basins. The proposed project is in Upland, San Bernardino County, and is within the jurisdiction of SCAQMD, which regulates air quality in the South Coast Air Basin (Basin).

The Basin comprises approximately 10,000 square miles and covers all of Orange County and the urban parts of Los Angeles, Riverside, and San Bernardino Counties. The Basin is on a coastal plain with connecting broad valleys and low hills to the east. Regionally, the Basin is bounded by the Pacific Ocean to the southwest and high mountains to the east, forming the inland perimeter.

Both State and federal governments have established health-based ambient air quality standards for six criteria air pollutants: carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and suspended particulate matter. In addition, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety. Two criteria pollutants, O_3 and NO_2, are considered regional pollutants because they (or their precursors) affect air quality on a regional scale. Pollutants such as CO, SO_2, and Pb are considered local pollutants that tend to accumulate in the air locally.

Air quality monitoring stations are located throughout the nation and are maintained by the local air districts and State air quality regulating agencies. Data collected at permanent monitoring stations are used by the United States Environmental Protection Agency (USEPA) to identify regions as "attainment" or "nonattainment" depending on whether the regions meet the requirements stated in the applicable National Ambient Air Quality Standards (NAAQS). Nonattainment areas are imposed with additional restrictions as required by the USEPA. In addition, different classifications of attainment (e.g., marginal, moderate, serious, severe, and extreme) are used to classify each air basin in the State on a pollutant-by-pollutant basis. The classifications are used as a foundation to create air quality management strategies to improve air quality and to comply with the NAAQS. As shown in Table B, the Basin is designated as nonattainment by the federal standards for O_3 and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) and nonattainment by the State standards for O_3, particulate matter less than 10 microns in diameter (PM_{10}), and $PM_{2.5}$.

O_3 levels, as measured by peak concentrations and the number of days over the State 1-hour standard, have declined substantially as a result of aggressive programs by SCAQMD and other regional, State, and federal agencies. The reduction of peak concentrations represents progress in improving public health; however, the Basin still exceeds the State standard for 1-hour and 8-hour O_3 levels. The USEPA lowered the 1997 0.80 parts per million (ppm) federal 8-hour ozone standard to 0.75 ppm in 2008 and then to 0.70 ppm on October 1, 2015. The Basin is classified nonattainment for the 1-hour and 8-hour ozone standards at the State and federal level.

Table B: Attainment Status of Criteria Pollutants in the South Coast Air Basin

Pollutant	State	Federal
O_3 1-hour	Nonattainment	N/A
O_3 8-hour	Nonattainment	Extreme Nonattainment
PM_{10}	Nonattainment	Attainment/Maintenance
$PM_{2.5}$	Nonattainment	Nonattainment
CO	Attainment	Attainment/Maintenance
NO_2	Attainment	Unclassified/Attainment (1-hour) Attainment/Maintenance (Annual)
SO_2	Unclassifiable/Attainment	Unclassifiable/Attainment
Lead	Attainment[1]	Unclassified/Attainment[1]
All Others	Attainment/Unclassified	Attainment/Unclassified

Source: NAAQS and CAAQS Attainment Status for South Coast Air Basin (SCAQMD 2024). Website: www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/naaqs-caaqs-feb2016.pdf (accessed November 2024).

[1] $PM_{2.5}$ federal attainment status shown is based on the 2012 12.0 µg/m^3 NAAQS, status based on the 2024 9.0 µg/m^3 NAAQS is pending.

[2] Only the Los Angeles County portion of the South Coast Air Basin is in nonattainment for lead.

CAAQS = California Ambient Air Quality Standards
CO = carbon monoxide
EPA = United States Environmental Protection Agency
N/A = not applicable
NAAQS = National Ambient Air Quality Standards
NO_2 = nitrogen dioxide
O_3 = ozone
PM_{10} = particulate matter less than 10 microns in diameter
$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter
SCAQMD = South Coast Air Quality Management District
SO_2 = sulfur dioxide

From 2021 to 2023, the Fontana-Arrow Highway Air Monitoring Station located at 14360 Arrow Boulevard in the City of Fontana (the closest monitoring station to the project limits) recorded the following exceedances of the State and federal 1-hour and 8-hour O_3 standards (full data included in Attachment C):[2]

- The State and federal 8-hour O_3 standard (which are the same) had 81 exceedances in 2021, 68 in 2022, and 74 in 2023.
- The State 1-hour O_3 standard had 44 exceedances in 2021, 4 in 2022, and 56 in 2023.

National and State standards have also been established for $PM_{2.5}$ over 24-hour and yearly averaging periods. $PM_{2.5}$, because of the small size of individual particles, can be especially harmful to human health. $PM_{2.5}$ is emitted by common combustion sources such as cars, trucks, buses, and power plants, in addition to ground-disturbing activities. On December 17, 2006, the USEPA strengthened the 24-hour $PM_{2.5}$ NAAQS from 65 micrograms per cubic meter (µg/m^3) to 35 µg/m^3, and the Basin was subsequently designated "moderate" nonattainment for the 2006 24-hour $PM_{2.5}$ NAAQS on December 14, 2009. On February 7, 2024, the USEPA strengthened the NAAQS for $PM_{2.5}$ by revising the primary (health-based) annual standard from 12.0 µg/m^3 to 9.0 µg/m^3; however, a new attainment designation has not been issued. The Basin is also considered a nonattainment area for

[2] California Air Resources Board (CARB). 2024. iADAM Air Quality Data Statistics. Website: www.arb.ca.gov/adam/topfour/topfour1.php (accessed November 2024).

the $PM_{2.5}$ standard at the State level. From 2021 to 2023, the Fontana-Arrow Highway Monitoring Station recorded the following exceedances of the federal 24-hour $PM_{2.5}$.

- The federal 24-hour $PM_{2.5}$ standard had 2 exceedances in 2021 with 1 in 2022 and 2023.

The Basin is classified as a PM_{10} nonattainment area at the State level and was redesignated from serious nonattainment to attainment of the federal PM_{10} standard on July 26, 2013. Because the Basin was redesignated from nonattainment to attainment, a PM_{10} maintenance plan was adopted in 2013 and is required to be updated every 10 years. From 2021 to 2023, the 1630 Fontana-Arrow Highway Air Monitoring Station recorded the following exceedances of the State and federal 24-hour PM_{10} standards:

- The State 24-hour PM_{10} standard had 3 exceedances in 2021, 6 exceedances in 2022, and 8 in 2023.

- The federal 24-hour PM_{10} standard had no exceedances in 2021, 2022, or 2023.

All areas of the Basin have continued to remain below the federal CO standards (35 ppm 1-hour and 9 ppm 8-hour) since 2003. The USEPA redesignated the Basin to attainment of the federal CO standards, effective June 11, 2017. The Basin is also well below the State CO standards (20 ppm 1-hour CO and 9 ppm 8-hour CO). From 2021 to 2023, the 1630 Fontana-Arrow Highway Air Monitoring Station recorded no exceedances of the State and federal 1-hour and 8-hour CO standards.

Greenhouse Gas Background

GHGs are present in the atmosphere naturally, are released by natural sources, or form from secondary reactions taking place in the atmosphere. Over the last 200 years, humans have caused substantial quantities of GHGs to be released into the atmosphere. These extra emissions are increasing GHG concentrations in the atmosphere and enhancing the natural greenhouse effect, which is believed to be causing global warming. Although manmade GHGs include naturally occurring GHGs such as carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), some gases like hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), nitrogen trifluoride (NF_3), and sulfur hexafluoride (SF_6) are completely new to the atmosphere.

Certain gases, such as water vapor, are short-lived in the atmosphere. Others remain in the atmosphere for significant periods of time, contributing to climate change in the long term. Water vapor is excluded from the list of GHGs above because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation.

These gases vary considerably in terms of global warming potential (GWP), which is a concept developed to compare the ability of each GHG to trap heat in the atmosphere relative to another gas. The GWP is based on several factors, including the relative effectiveness of a gas in absorbing infrared radiation and the length of time that the gas remains in the atmosphere (atmospheric lifetime). The GWP of each gas is measured relative to CO_2, the most abundant GHG; the definition

of GWP for a particular GHG is the ratio of heat trapped by one unit mass of the GHG to the ratio of heat trapped by one unit mass of CO_2 over a specified time period. GHG emissions are typically measured in terms of pounds or tons of CO_2 equivalents (CO_2e).

REGULATORY SETTING

Air Quality

This section provides regulatory background information for air quality at the federal, State, and local levels.

Federal Regulations

The 1970 Federal Clean Air Act (CAA) authorized the establishment of national health-based air quality standards and set deadlines for their attainment. The CAA Amendments of 1990 changed deadlines for attaining national standards as well as the remedial actions required for areas of the nation that exceed the standards. Under the CAA, State and local agencies in areas that exceed the national standards are required to develop State Implementation Plans to demonstrate how they will achieve the national standards by specified dates.

State Regulations

In 1988, the California Clean Air Act (CCAA) required that all air districts in the State endeavor to achieve and maintain California Ambient Air Quality Standards (CAAQS) for CO, O_3, SO_2, and NO_2 by the earliest practical date. The CCAA provides districts with the authority to regulate indirect sources and mandates that air quality districts focus particular attention on reducing emissions from transportation and area-wide emission sources. Each nonattainment district is required to adopt a plan to achieve a 5 percent annual reduction, averaged over consecutive 3-year periods, in district-wide emissions of each nonattainment pollutant or its precursors. A Clean Air Plan shows how a district would reduce emissions to achieve air quality standards. Generally, the State standards for these pollutants are more stringent than the national standards.

The California Air Resources Board (CARB) is the State's "clean air agency." CARB's goals are to attain and maintain healthy air quality, protect the public from exposure to toxic air contaminants, and oversee compliance with air pollution rules and regulations.

Regional Regulations

The proposed project would be required to comply with regional rules that assist in reducing short-term air pollutant emissions. SCAQMD Rule 403 requires that fugitive dust be controlled with best available control measures so that the presence of such dust does not remain visible in the atmosphere beyond the property line of the emissions source. In addition, SCAQMD Rule 403 requires implementation of dust suppression techniques to prevent fugitive dust from creating a nuisance off site. SCAQMD Rule 1113 limits the volatile organic compound (VOC) content of architectural coatings. Applicable dust suppression techniques from SCAQMD Rule 403 and low VOC content in paints under SCAQMD Rule 1113 are summarized below. Implementation of these dust

suppression techniques can reduce the fugitive dust generation (and thus the PM_{10} component). Compliance with these rules would reduce impacts on nearby sensitive receptors.[3]

South Coast Air Quality Management District Rule 403 Measures.

- Water active sites at least two times daily (locations where grading is to occur will be thoroughly watered prior to earthmoving).
- All trucks hauling dirt, sand, soil, or other loose materials are to be covered or should maintain at least 2 feet of freeboard in accordance with the requirements of California Vehicle Code Section 23114 (freeboard means vertical space between the top of the load and top of the trailer).
- Traffic speeds on all unpaved roads shall be reduced to 15 miles per hour or less.

South Coast Air Quality Management District Rule 1113 Measures. SCAQMD Rule 1113 governs the sale, use, and manufacture of architectural coating and limits the VOC content in paints and paint solvents. This rule regulates the VOC content of paints available during construction and operation of the proposed project. Therefore, all paints and solvents used during construction and operation of the proposed project must comply with SCAQMD Rule 1113.

Local Regulations

City of Upland General Plan 2010. The City of Upland addresses air quality in the Open Space and Conservation and Circulation Element of the City of Upland General Plan 2015.[4] The General Plan contains goals and policies that work to protect air, water, and energy resources from pollution and overuse. The following policies are applicable to the proposed project:

- Cooperate with the South Coast Air Quality Management District (SCAQMD) and other regional agencies to implement and enforce regional air quality management plans.
- Support alternative transportation modes, alternative technologies, and bicycle- and pedestrian-friendly neighborhoods to reduce emissions related to vehicular travel.
- Encourage development that incorporates pedestrian- and transit-oriented design and landscape elements.

Greenhouse Gas Emissions

This section describes regulations related to global climate change at the federal, State, and local levels.

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3 SCAQMD. 2024. South Coast AQMD Rule Book. Website: www.aqmd.gov/home/rules-compliance/rules (accessed November 2024).

4 City of Upland. 2015. *Upland General Plan*, Open Space and Conservation and Circulation Element. Website: www.uplandca.gov/general-plan-map (accessed November 2024).

Federal Regulations

The United States has historically had a voluntary approach to reducing GHG emissions. However, on April 2, 2007, the United States Supreme Court ruled that the USEPA has the authority to regulate CO_2 emissions under the CAA.

Although there currently are no adopted federal regulations for the control or reduction of GHG emissions, the USEPA commenced several actions in 2009 to implement a regulatory approach to global climate change, including the 2009 USEPA final rule for mandatory reporting of GHGs from large GHG emission sources in the United States. Additionally, the USEPA Administrator signed an endangerment finding action in 2009 under the CAA, finding that seven GHGs (CO_2, CH_4, N_2O, HFCs, NF_3, PFCs, and SF_6) constitute a threat to public health and welfare, and that the combined emissions from motor vehicles cause and contribute to global climate change, leading to national GHG emission standards.

State Regulations

CARB is the lead agency for implementing climate change regulations in the State. Since its formation, CARB has worked with the public, the business sector, and local governments to find solutions to California's air pollution problems. Key efforts by the State are described below.

Assembly Bill 32 (2006), California Global Warming Solutions Act. California's major initiative for reducing GHG emissions is Assembly Bill (AB) 32, passed by the State Legislature on August 31, 2006. This effort set a target to reduce GHG emissions to 1990 levels by 2020. CARB has established the level of GHG emissions in 1990 at 427 million metric tons (MMT) of CO_2e. The emissions target of 427 MMT CO_2e requires the reduction of 169 MMT CO_2e from the State's projected business-as-usual 2020 emissions of 596 MMT CO_2e. AB 32 requires CARB to prepare a Scoping Plan that outlines the main State strategies for meeting the 2020 deadline and to reduce GHGs that contribute to global climate change. CARB approved the Scoping Plan on December 11, 2008, which contains the main strategies California will implement to achieve the reduction goals and includes CARB-recommended GHG reductions for each emissions sector of the State's GHG inventory.

The CARB approved the First Update to the Climate Change Scoping Plan on May 22, 2014. The First Update identifies opportunities to leverage existing and new funds to further drive GHG emission reductions through strategic planning and targeted low carbon investments. The First Update defines CARB climate change priorities until 2020 and sets the groundwork to reach long-term goals set forth in Executive Orders (EOs) S-3-05 and B-16-2012. The First Update highlights California's progress toward meeting the "near-term" 2020 GHG emission reduction goals as defined in the initial Scoping Plan. It also evaluates how to align the State's "longer-term" GHG reduction strategies with other State policy priorities for water, waste, natural resources, clean energy, transportation, and land use. The CARB released a second update to the Scoping Plan, the 2017 Scoping Plan,[5] to reflect the 2030 target that was set by EO B-30-15 and codified by Senate Bill (SB) 32.

[5] CARB. 2017. *California's 2017 Climate Change Scoping Plan*. November.

The 2022 Scoping Plan[6] was approved in December 2022 and assesses progress toward the statutory 2030 target while laying out a path to achieving carbon neutrality no later than 2045. The 2022 Scoping Plan Update focuses on outcomes needed to achieve carbon neutrality by assessing paths for clean technology, energy deployment, natural and working lands, and others, and is designed to meet the State's long-term climate objectives and support a range of economic, environmental, energy security, environmental justice, and public health priorities.

The 2022 Scoping Plan focuses on building clean energy production and distribution infrastructure for a carbon-neutral future, including transitioning existing energy production and transmission infrastructure to produce zero-carbon electricity and hydrogen and utilizing biogas resulting from wildfire management or landfill and dairy operations, among other substitutes. The 2022 Scoping Plan states that in almost all sectors, electrification will play an important role. The 2022 Scoping Plan evaluates clean energy and technology options and the transition away from fossil fuels, including adding four times the solar and wind capacity by 2045 and about 1,700 times the amount of current hydrogen supply. As discussed in the 2022 Scoping Plan, EO N-79-20 requires that all new passenger vehicles sold in California be zero-emission by 2035 and that all other fleets transition to zero-emission as fully as possible by 2045, which will reduce the percentage of fossil fuel combustion vehicles.[7]

Senate Bill 375 (2008). Signed into law on October 1, 2008, SB 375 supplements GHG reductions from new vehicle technology and fuel standards with reductions from more efficient land use patterns and improved transportation. Under the law, CARB-approved GHG reduction targets in February 2011 for California's 18 federally designated regional planning bodies, known as Metropolitan Planning Organizations (MPOs). CARB may update the targets every 4 years and must update them every 8 years. MPOs, in turn, must demonstrate how their plans, policies, and transportation investments meet the targets set by CARB through Sustainable Community Strategies (SCSs). The SCSs are included with the Regional Transportation Plan (RTP), a report required by State law. However, if an MPO finds that its SCS will not meet the GHG reduction targets, it may prepare an Alternative Planning Strategy. The Alternative Planning Strategy identifies the impediments to achieving the targets.

Executive Order B-30-15 (2015). Governor Jerry Brown signed EO B-30-15 on April 29, 2015, which added the immediate target of:

- GHG emissions reduced to 40 percent below 1990 levels by 2030.

All State agencies with jurisdiction over sources of GHG emissions were directed to implement measures to achieve reductions of GHG emissions to meet the 2030 and 2050 targets. CARB was directed to update the AB 32 Scoping Plan to reflect the 2030 target and, therefore, is moving forward with the update process. The mid-term target is critical to help frame the suite of policy

6 CARB. 2022. *2022 Scoping Plan Update*. May 10. Website: ww2.arb.ca.gov/sites/default/files/2022-12/2022-sp.pdf (accessed November 2024).

7 Ibid.

measures, regulations, planning efforts, and investments in clean technologies and infrastructure needed to continue reducing emissions.

Senate Bill 350 (2015) Clean Energy and Pollution Reduction Act. SB 350, signed by Governor Jerry Brown on October 7, 2015, updates and enhances AB 32 by introducing the following set of objectives in clean energy, clean air, and pollution reduction for 2030:

- Raise California's renewable portfolio standard from 33 percent to 50 percent.
- Increase energy efficiency in buildings by 50 percent by the year 2030.

The 50 percent renewable energy standard will be implemented by the California Public Utilities Commission for private utilities and by the California Energy Commission for municipal utilities. Each utility must submit a procurement plan showing it will purchase clean energy to displace other nonrenewable resources. The 50 percent increase in energy efficiency in buildings must be achieved through the use of existing energy efficiency retrofit funding and regulatory tools already available to State energy agencies under existing law. The addition made by this legislation requires State energy agencies to plan for and implement those programs in a manner that achieves the energy efficiency target.

Senate Bill 32, California Global Warming Solutions Act of 2016, and Assembly Bill 197. In summer 2016, the Legislature passed, and the Governor signed, SB 32 and AB 197. SB 32 affirms the importance of addressing climate change by codifying into statute the GHG emission reduction target of at least 40 percent below 1990 levels by 2030 contained in Governor Brown's April 2015 EO B-30-15. SB 32 builds on AB 32 and keeps us on the path toward achieving the State's 2050 objective of reducing emissions to 80 percent below 1990 levels, consistent with an Intergovernmental Panel on Climate Change analysis of the emission trajectory that would stabilize atmospheric GHG concentrations at 450 ppm CO_2e and reduce the likelihood of catastrophic impacts from climate change.

AB 197, the companion bill to SB 32, provides additional direction to CARB related to the adoption of strategies to reduce GHG emissions. Additional direction in AB 197 meant to provide easier public access to air emissions data that are collected by CARB was posted in December 2016.

Senate Bill 100. On September 10, 2018, Governor Brown signed SB 100, which raises California's renewable portfolio standard requirements to 60 percent by 2030, with interim targets, and 100 percent by 2045. The bill also establishes a State policy that eligible renewable energy resources and zero-carbon resources supply 100 percent of all retail sales of electricity to California end-use customers and 100 percent of electricity procured to serve all State agencies by December 31, 2045. Under the bill, the State cannot increase carbon emissions elsewhere in the western grid or allow resource shuffling to achieve the 100 percent carbon-free electricity target.

Executive Order B-55-18. EO B-55-18, signed September 10, 2018, sets a goal "to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter." EO B-55-18 directs CARB to work with relevant State agencies to ensure that future Scoping Plans identify and recommend measures to achieve the carbon neutrality goal. The goal of carbon neutrality by 2045 is in addition to other statewide goals, meaning that not only

should emissions be reduced to 80 percent below 1990 levels by 2050, but that, by no later than 2045, the remaining emissions should be offset by equivalent net removals of CO_2e from the atmosphere, including through sequestration in forests, soils, and other natural landscapes.

Assembly Bill 1279. AB 1279 was signed in September 2022 and codifies the State goals of achieving net carbon neutrality by 2045 and maintaining net negative GHG emissions thereafter. This bill also requires California to reduce statewide GHG emissions by 85 percent compared to 1990 levels by 2045 and directs CARB to work with relevant State agencies to achieve these goals.

Title 24, Building Efficiencies Standards, and the California Green Building Standards Code. In November 2008, the California Building Standards Commission established the California Green Building Standards Code (CALGreen) (California Code of Regulations Title 24, Part 11), which sets performance standards for residential and nonresidential development to reduce environmental impacts and to encourage sustainable construction practices. CALGreen addresses energy efficiency, water conservation, material conservation, planning and design, and overall environmental quality. CALGreen is updated every 3 years and was most recently updated in 2022 to include new mandatory measures for residential as well as nonresidential uses; the new measures took effect on January 1, 2023.

Regional Regulations

Southern California Association of Governments. The Southern California Association of Governments (SCAG) is a regional council consisting of the following six counties: Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura. In total, the SCAG region encompasses 191 cities and more than 38,000 square miles within Southern California. SCAG is the MPO serving the region under federal law and serves as the Joint Powers Authority, the Regional Transportation Planning Agency, and the Council of Governments under State law. As the Regional Transportation Planning Agency, SCAG prepares long-range transportation plans for the Southern California region, including the RTP/SCS and the 2008 Regional Comprehensive Plan.[8]

On April 4, 2024, SCAG adopted *Connect SoCal: The 2024–2050 Regional Transportation Plan/Sustainable Communities Strategy* (2024–2050 RTP/SCS).[9] In general, the SCS outlines a development pattern for the region, which, when integrated with the transportation network and other transportation measures and policies, would reduce vehicle miles traveled from automobiles and light-duty trucks and thereby reduce GHG emissions from these sources. For the SCAG region, CARB has set GHG reduction targets at 8 percent below 2005 per-capita emission levels by 2020 and 19 percent below 2005 per capita emission levels by 2035. The RTP/SCS lays out a strategy for the region to meet these targets. Overall, the SCS is meant to provide growth strategies that will achieve the regional GHG emission reduction targets. Land use strategies to achieve the region's targets

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8 Southern California Association of Governments (SCAG). 2008. *Final 2008 Regional Comprehensive Plan*. Website: scag.ca.gov/sites/main/files/file-attachments/f2008rcp_complete.pdf?1604263359 (accessed November 2024).

9 SCAG. 2020. *Connect SoCal: The 2020–2045 Regional Transportation Plan/Sustainable Communities Strategy of the Southern California Association of Governments*. Website: scag.ca.gov/sites/main/files/file-attachments/0903fconnectsocal-plan_0.pdf?1606001176 (accessed November 2024).

include planning for new growth around high-quality transit areas and livable corridors and creating neighborhood mobility areas to integrate land use and transportation and plan for more active lifestyles.[10] However, the SCS does not require that local General Plans, Specific Plans, or zoning be consistent with the SCS; instead, it provides incentives to governments and developers for consistency.

South Coast Air Quality Management District. In 2008, the SCAQMD formed a GHG CEQA Significance Threshold Working Group (Working Group) to identify GHG emission thresholds for land use projects that could be used by local lead agencies in the SCAQMD. The Working Group developed several different options that are contained in the SCAQMD 2008 draft guidance document titled *Interim CEQA GHG Significance Threshold for Stationary Sources, Rules and Plans* (2008) that could be applied by lead agencies. On September 28, 2010, SCAQMD Working Group Meeting No. 15 provided further guidance, including a tiered approach for evaluating GHG emissions for development projects where SCAQMD is not the lead agency. SCAQMD has not presented a finalized version of these thresholds to the governing board.

SCAQMD identifies the emission level for which a project would not be expected to substantially conflict with any State legislation adopted to reduce statewide GHG emissions. As such, the utilization of a service population represents the rates of emissions needed to achieve a fair share of the State's mandated emissions reductions. Overall, SCAQMD identifies a GHG efficiency level that, when applied statewide or to a defined geographic area, would meet the 2020 and post-2020 emission targets required by AB 32 and SB 32. If projects are able to achieve targeted rates of emissions per the service population, the State would be able to accommodate expected population growth and achieve economic development objectives while also abiding by AB 32's emission target and future post-2020 targets. The SCAQMD has established a flowchart for evaluating GHG significance and indicates that when a project is exempt from California Environmental Quality Act (CEQA), no further analysis is required.

Local Regulations

City of Upland General Plan 2010. The City's General Plan[11] contains extensive policies directly related to GHGs and climate change. This includes measures to improve transit efficiency, reduce truck idling, increase ridesharing, promote mixed land uses, and requiring the implementation of Renewable energy systems, water efficient landscaping, and energy efficient, sustainable building standard. The Open Space and Conservation Element also includes greenhouse gas emissions assessments, monitoring, and reduction policies.

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10 SCAG. 2020. *Connect SoCal: The 2020–2045 Regional Transportation Plan/Sustainable Communities Strategy of the Southern California Association of Governments*. Website: scag.ca.gov/sites/main/files/file-attachments/0903fconnectsocal-plan_0.pdf?1606001176 (accessed November 2024).

11 City of Upland. 2015. *Upland General Plan*, Open Space and Conservation Element. Website: www.uplandca.gov/general-plan-map (accessed November 2024).

METHODOLOGY

Construction Emissions

Construction activities can generate a substantial amount of air pollution. Construction activities are considered temporary; however, short-term impacts can contribute to exceedances of air quality standards. Construction activities include site preparation, earthmoving, and general construction. The emissions generated from these common construction activities include fugitive dust from soil disturbance and fuel combustion by mobile heavy-duty, diesel- and gasoline-powered equipment, portable auxiliary equipment, and worker commute trips.

LSA used the California Emissions Estimator Model version 2022.1 (CalEEMod) computer program to calculate emissions from on-site construction equipment and emissions from worker and vehicle trips to the site. As mentioned in the Project Description section, construction of the proposed project would include site preparation, grading, building construction, paving, and architectural coating activities, which was included in CalEEMod. This analysis assumes that construction would begin in Spring 2025 and be completed by the end of 2026. The proposed project would require approximately 1,700 tons of roadway debris to be removed from the site and approximately 900 cubic yards of soil to be imported to the site, which was included in CalEEMod. This analysis assumes compliance with SCAQMD Rule 403 measures.[12] All other construction details are not yet known; therefore, default assumptions (e.g., construction equipment and construction hauling and vendor truck trips and fleet activities) from CalEEMod were used.

Operational Emissions

This air quality analysis includes estimating emissions associated with long-term operation of the project. Indirect emissions of criteria pollutants with regional impacts would be emitted by project-generated vehicle trips. In addition, localized air quality impacts (i.e., higher CO concentrations or "hot-spots") near intersections or roadway segments in the project vicinity would also potentially occur due to project-generated vehicle trips.

Consistent with SCAQMD guidance for estimating emissions associated with land use development projects, the CalEEMod computer program was used to calculate the long-term operational emissions associated with the project. As discussed in the Project Description section, the proposed project would construct two buildings: a 3,698-square-foot SAWCO headquarters and a 4,066-square-foot maintenance building. Additionally, a maintenance yard, driveway, parking lot, solar cover, landscaping, and utility improvements would be constructed. The headquarters building would feature office space, meeting and conference rooms, a copy room, and a work area. The maintenance building would include storage space, an outdoor welding area, a motor repair room, electrical rooms, an ADA restroom, a locker room, and a maintenance office/break room. Therefore, this analysis was conducted using the CalEEMod land use codes for *Government Office Building, Automobile Care Center,* and *Parking Lot*.

[12] SCAQMD. 2024. South Coast AQMD Rule Book. Website: www.aqmd.gov/home/rules-compliance/rules (accessed November 2024).

Greenhouse Gas Emissions

GHG emissions associated with the project would occur over the short term from construction activities, consisting primarily of emissions from equipment exhaust. There would also be long-term GHG emissions associated with project operations, including project-related vehicular exhaust and energy consumption. Recognizing that the field of global climate change analysis is rapidly evolving, the approaches advocated most recently indicate that for determining a project's contribution to GHG emissions, lead agencies should calculate, or estimate, emissions from vehicular traffic, energy consumption, water conveyance and treatment, waste generation, construction activities, and any other significant source of emissions within the project area. The CalEEMod results were used to quantify GHG emissions generated by the proposed project.

THRESHOLDS OF SIGNIFICANCE

The *State CEQA Guidelines* indicate that a project would normally have a significant adverse air quality impact if project-generated pollutant emissions would do any of the following:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project is nonattainment under applicable federal or State ambient air quality standards;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Result in other emissions (such as those leading to odors) affecting a substantial number of people.

Certain air districts (e.g., SCAQMD) have created guidelines and requirements to conduct air quality analysis. The SCAQMD's current guidelines, the *CEQA Air Quality Handbook*[13] with associated updates, were followed in this assessment of air quality impacts for the proposed project.

Regional Emissions Thresholds

SCAQMD has established daily emission thresholds for construction and operation of proposed projects. The emission thresholds were established based on the attainment status of the Basin with regards to air quality standards for specific criteria pollutants. Because the concentration standards were set at a level that protects public health with an adequate margin of safety, these emission thresholds are regarded as conservative and would overstate an individual project's contribution to health risks. Table C lists the CEQA significance thresholds for construction and operational emissions established for the Basin.

[13] SCAQMD. 1993. *CEQA Air Quality Handbook.* Website: www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/ceqa-air-quality-handbook-(1993) (accessed November 2024).

Table C: Regional Thresholds for Construction and Operational Emissions

Emissions Source	Pollutant Emissions Threshold (lbs/day)					
	VOCs	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Construction	75	100	550	150	150	55
Operations	55	55	550	150	150	55

Source: Air Quality Significance Thresholds (SCAQMD 2024). Website: www.aqmd.gov/docs/default-source/ceqa/handbook/south-coast-aqmd-air-quality-significance-thresholds.pdf (accessed November 2024).

CO = carbon monoxide
lbs/day = pounds per day
NO_X = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
SCAQMD = South Coast Air Quality Management District
SO_X = sulfur oxides
VOCs = volatile organic compounds

Projects in the SCAQMD with construction- or operations-related emissions that exceed any of their respective emission thresholds would be considered significant under SCAQMD guidelines. These thresholds, which the SCAQMD developed and which apply throughout the SCAQMD, apply as both project and cumulative thresholds. If a project exceeds these standards, it would be considered to have a project-specific and cumulative impact.

Local Microscale Concentration Standards

The significance of localized project impacts under CEQA depends on whether ambient CO levels in the project vicinity are above or below State and federal CO standards. Because ambient CO levels are below the standards throughout the SCAQMD, a project would be considered to have a significant CO impact if project emissions would result in an exceedance of one or more of the 1-hour or 8-hour standards. The following are applicable local emission concentration standards for CO:

- California State 1-hour CO standard of 20 ppm
- California State 8-hour CO standard of 9 ppm

Localized Impacts Analysis

SCAQMD published its Final Localized Significance Threshold Methodology in July 2008, recommending that all air quality analyses include an assessment of air quality impacts to nearby sensitive receptors.[14] This guidance was used to analyze potential localized air quality impacts associated with construction of the proposed project. Localized significance thresholds (LSTs) are developed based on the size or total area of the emission source, the ambient air quality in the Source Receptor Area (SRA), and the distance to the project. Sensitive receptors include residences, schools, hospitals, and similar uses that are sensitive to adverse air quality. As described in the Project Description section and in Table A, the nearest sensitive receptors are 90 feet to the west during construction and 300 feet to the north after construction during operations.

LSTs are based on the ambient concentrations of that pollutant within the project SRA and the distance to the nearest sensitive receptor. For the proposed project, the appropriate SRA for the LST is the Northwest San Bernardino Valley area (SRA 32). SCAQMD provides LST screening tables for

14 SCAQMD. 2008. *Final Localized Significance Threshold Methodology*. July.

25-, 50-, 100-, 200-, and 500-meter source-receptor distances. As identified above, the closest sensitive receptors nearby the project limits include single-family residential uses located approximately 90 feet from the western boundaries of the project limits. it is assumed that the maximum daily disturbed acreage for the proposed project could be 4.92 acres (the entire site). Table D lists the emissions thresholds that apply during project construction and operation (derived by interpolating the SCAQMD screening tables).

Table D: SCAQMD Localized Significance Thresholds

Emissions Source	Pollutant Emissions Threshold (lbs/day)			
	NO_x	CO	PM_{10}	$PM_{2.5}$
Construction (4.92-acres, 90-foot distance)	270	2,230	18	9
Operations (4.92-acre site, 300-foot distance)	361	4,742	18	5

Source: *Final Localized Significance Threshold Methodology* (SCAQMD 2008).
CO = carbon monoxide
lbs/day = pounds per day
NO_x = nitrogen oxides
PM_{10} = particulate matter less than 10 microns in size
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
SCAQMD = South Coast Air Quality Management District

Greenhouse Gas Thresholds

The *State CEQA Guidelines* indicate that a project would normally have a significant adverse greenhouse gas emissions impact if the project would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or

- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

Section 15064.4 of the *State CEQA Guidelines* states that: "A lead agency should make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate, or estimate the amount of greenhouse gas emissions resulting from a project." In performing that analysis, the lead agency has discretion to determine whether to use a model or methodology to quantify GHG emissions or to rely on a qualitative analysis or performance-based standards. In making a determination as to the significance of potential impacts, the lead agency then considers the extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting, whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project, and the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.

To provide guidance to local lead agencies on determining significance for GHG emissions in their CEQA documents, SCAQMD has convened a Working Group. Based on the last Working Group meeting held in September 2010 (Meeting No. 15), SCAQMD proposed to adopt a tiered approach for evaluating GHG emissions for development projects where SCAQMD is not the lead agency:

- **Tier 1—Exemptions:** If a project is exempt from CEQA, project-level and cumulative GHG emissions are less than significant.

- **Tier 2—Consistency with a Locally Adopted GHG Reduction Plan:** If the project complies with a GHG emissions reduction plan or mitigation program that avoids or substantially reduces GHG emissions in the project's geographic area (i.e., city or county), project-level and cumulative GHG emissions are less than significant.

- **Tier 3—Numerical Screening Threshold:** If GHG emissions are less than the numerical screening-level threshold, project-level and cumulative GHG emissions are less than significant.

  For projects that are not exempt or where no qualifying GHG reduction plans are directly applicable, SCAQMD requires an assessment of GHG emissions. SCAQMD, under Option 1, is proposing a "bright-line" screening-level threshold of 3,000 metric tons (MT) of CO_2e (or MT CO_2e) per year (or MT CO_2e/year) for all land use types or, under Option 2, the following land use-specific thresholds: 1,400 MT CO_2e for commercial projects; 3,500 MT CO_2e for residential projects, or 3,000 MT CO_2e for mixed-use projects. This bright-line threshold is based on a review of the Governor's Office of Planning and Research (OPR) database of CEQA projects. Based on their review of 711 CEQA projects, 90 percent of CEQA projects would exceed the bright-line thresholds identified above. Therefore, projects that do not exceed the bright-line threshold would have a nominal and therefore less than cumulatively considerable impact on GHG emissions.

- **Tier 4—Performance Standards:** If emissions exceed the numerical screening threshold, a more detailed review of the project's GHG emissions is warranted. The SCAQMD has proposed an efficiency target for projects that exceed the bright-line threshold. The current recommended approach is per-capita efficiency targets. The SCAQMD is not recommending use of a percentage emissions reduction target. Instead, the SCAQMD proposes proposed a 2020 efficiency target of 4.8 MT CO_2e per year per service population for project-level analyses and 6.6 MT CO_2e per year per service population for plan-level projects (e.g., program-level projects such as General Plans).

For the purpose of this analysis, the proposed project will be compared to the threshold of 3,000 MT CO_2e per year for all land use types. The project is also evaluated for compliance with the CARB Scoping Plan and SCAG's RTP/SCS.

IMPACT ANALYSIS

This section identifies potential air quality and GHG impacts associated with implementation of the proposed project.

Air Quality Impacts

Air pollutant emissions associated with the project would occur over the short term from construction activities and over the long term from project-related vehicular trips and energy consumption.

Consistency with Applicable Air Quality Plans

A consistency determination plays an essential role in local agency project review by linking local planning and unique individual projects to the air quality plans. A consistency determination fulfills the CEQA goal of fully informing local agency decision makers of the environmental costs of the project under consideration at a stage early enough to ensure that air quality concerns are addressed. Air quality plan strategies are typically based on projections from local General Plans.

The proposed project would develop an existing undeveloped portion of SAWCO land into new SAWCO headquarters. It is anticipated that approximately 10 people would be employed in the new headquarters. The proposed project is not considered a project of statewide, regional, or area-wide significance (e.g., large-scale projects such as airports, electrical generating facilities, petroleum and gas refineries; a residential development of more than 500 dwelling units; or shopping center or business establishment employing more than 1,000 persons or encompassing more than 500,000 square feet of floor space) as defined in the California Code of Regulations (Title 14, Division 6, Chapter 3, Article 13, Section 15206(b)). Because the proposed project would not be defined as a regionally significant project under CEQA, it does not meet the SCAG's Intergovernmental Review criteria.

To comply with the City's General Plan and zoning regulations, the project will require a General Plan amendment and a zone change. Currently, the project site has an SFR-L General Plan designation and is within the Single-Family Residential 76,500 (RS-7.5) zone. The proposed use is not currently permitted at the site. However, the City plans to revise their General Plan and zoning to accommodate this project.

The City of Upland General Plan is consistent with the SCAG Regional Comprehensive Plan Guidelines[15] and the SCAQMD Air Quality Management Plan (AQMP).[16] The revisions to accommodate this project will not change that. Pursuant to the methodology provided in the SCAQMD *CEQA Air Quality Handbook*,[17] consistency with the Basin AQMP is affirmed when a project (1) would not increase the frequency or severity of an air quality standards violation or cause a new violation, and (2) is consistent with the growth assumptions in the AQMP. Consistency review is presented as follows:

1. The project would result in short-term construction and long-term operational pollutant emissions that are all less than the CEQA significance emissions thresholds established by SCAQMD, as demonstrated below; therefore, the project would not result in an increase in the frequency or severity of an air quality standards violation or cause a new air quality standards violation.

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15 SCAG. 2008. *Final 2008 Regional Comprehensive Plan*. Website: scag.ca.gov/sites/main/files/file-attachments/f2008rcp_complete.pdf?1604263359 (accessed November 2024).

16 SCAQMD. 2022. *2022 Air Quality Management Plan*. Website: www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/final-2022-aqmp/final-2022-aqmp.pdf?sfvrsn=16 (accessed November 2024).

17 SCAQMD. 1993. *CEQA Air Quality Handbook.* Website: www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/ceqa-air-quality-handbook-(1993) (accessed November 2024).

2. The *CEQA Air Quality Handbook* indicates that consistency with AQMP growth assumptions must be analyzed for new or amended General Plan elements, Specific Plans, and significant projects. Significant projects include airports, electrical generating facilities, petroleum and gas refineries, designation of oil drilling districts, water ports, solid waste disposal sites, and offshore drilling facilities; therefore, the proposed project is not defined as significant. According to SCAG's 2024–2050 RTP/SCS, the City of Upland households and jobs are forecast to increase by approximately 5,700 households and 4,900 jobs, respectively, between 2019 and 2050. Based on information provided by the Project Applicant, the proposed project would have approximately 10 employees. The number of new employees generated by the proposed project would fall within the 4,900 projected jobs for the City. Accordingly, the proposed project's labor demand would not be expected to substantially increase population, households, or employment in Upland since the number of employees associated with the proposed project would be a small fraction (approximately 0.2 percent) of the projected job growth for the City. Therefore, implementation of the proposed project would not interfere with SCAG's ability to implement the regional strategies outlined in the 2024–2050 RTP/SCS.

Based on the consistency analysis presented above, the proposed project would be consistent with the regional AQMP.

Criteria Pollutant Analysis

The Basin is currently designated as nonattainment for the federal and State standards for O_3 and $PM_{2.5}$. In addition, the Basin is in nonattainment for the PM_{10} standard. The Basin's nonattainment status is attributed to the region's development history. Past, present, and future development projects contribute to the region's adverse air quality impacts on a cumulative basis. By its very nature, air pollution is largely a cumulative impact. No single project is sufficient in size to, by itself, result in nonattainment of an ambient air quality standard. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's contribution to the cumulative impact is considerable, then the project's impact on air quality would be considered significant.

In developing thresholds of significance for air pollutants, SCAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions. Therefore, additional analysis to assess cumulative impacts is not necessary. The following analysis assesses the potential project-level air quality impacts associated with construction and operation of the proposed project.

Construction Emissions. During construction, short-term degradation of air quality may occur due to the release of particulate matter emissions (i.e., fugitive dust) generated by ground disturbance, paving, and other activities. Emissions from construction equipment are also anticipated and would include CO, nitrogen oxides (NO_x), VOC, directly emitted $PM_{2.5}$ or PM_{10}, and toxic air contaminants such as diesel exhaust particulate matter.

Project construction activities would include grubbing and land clearing, grading, drainage, utilities, building construction, and paving activities. Sources of fugitive dust would include disturbed soils at the construction site. Unless properly controlled, vehicles leaving the site would deposit dirt and mud on local streets, which could be an additional source of airborne dust after it dries. PM_{10} emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM_{10} emissions would depend on soil moisture, silt content of soil, wind speed, and amount of operating equipment. Larger dust particles would settle near the source, whereas fine particles would be dispersed over greater distances from the construction site.

Water or other soil stabilizers can be used to control dust, resulting in emission reductions of 50 percent or more. SCAQMD has established Rule 403: Fugitive Dust, which would require the applicant to implement measures that would reduce the amount of particulate matter generated during the construction period. The Rule 403 measures that were incorporated in this analysis include:[18]

- Water active sites at least twice daily (locations where earth disturbance is to occur shall be thoroughly watered prior to earthmoving).

- Cover all trucks hauling dirt, sand, soil, or other loose materials, or maintain at least 2 feet (0.6 meter) of freeboard (vertical space between the top of the load and the top of the trailer) in accordance with the requirements of California Vehicle Code Section 23114.

- Reduce traffic speeds on all unpaved roads to 15 miles per hour or less.

In addition to dust-related PM_{10} emissions, heavy trucks and construction equipment powered by gasoline and diesel engines would generate CO, sulfur oxides (SO_x), NO_x, VOCs, and some soot particulate ($PM_{2.5}$ and PM_{10}) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase slightly while those vehicles idle in traffic. These emissions would be temporary in nature and limited to the immediate area surrounding the construction site.

Construction emissions were estimated for the project using CalEEMod and are summarized in Table E. Attachment B includes the CalEEMod output sheets.

The results shown in Table E indicate the proposed project would not exceed the significance criteria for daily VOCs, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$ emissions. Therefore, construction of the proposed project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or State AAQS.

[18] SCAQMD. 2024. South Coast AQMD Rule Book. Website: www.aqmd.gov/home/rules-compliance/rules (accessed November 2024).

Table E: Short-Term Regional Construction Emissions

Construction Phase	Maximum Daily Regional Pollutant Emissions (lbs/day)					
	VOC	NO_X	CO	SO_X	Total PM_{10}	Total $PM_{2.5}$
Site Preparation	1.3	12.1	12.7	<1	2.3	1.3
Grading	1.6	14.1	15.3	<1	2.6	1.5
Building Construction	1.1	9.1	11.3	<1	<1	<1
Architectural Coating	0.4	0.9	1.3	<1	<1	<1
Paving	0.5	4.5	7.4	<1	<1	<1
Peak Daily Emissions	**1.6**	**14.1**	**15.3**	**<1**	**2.6**	**1.5**
SCAQMD Threshold	**75**	**100**	**550**	**150**	**150**	**55**
Significant?	**No**	**No**	**No**	**No**	**No**	**No**

Source: Compiled by LSA (November 2024).
Note: The maximum emissions of summer and winter modeling results were used to evaluate construction emissions impacts. CalEEMod output sheets are provided in Attachment B. Values may not appear to add up correctly due to rounding.
CO = carbon monoxide
lbs/day = pounds per day
NO_x = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
SCAQMD = South Coast Air Quality Management District
SO_x = sulfur oxides
VOC = volatile organic compounds

Operational Air Quality Impacts. Long-term air pollutant emissions associated with operation of the proposed project include emissions from area, energy, and mobile sources. Area-source emissions include architectural coatings, consumer products, and landscaping. Energy-source emissions result from utility plants generating electricity used by the project. Typically, energy-source emissions would also include emissions from natural gas consumption, however, the proposed project would not use natural gas. Mobile-source emissions are from vehicle trips associated with operation of the project. Mobile source emissions include VOC and NO_X emissions that contribute to the formation of O_3. Additionally, PM_{10} emissions result from running exhaust, tire and brake wear, and the entrainment of dust into the atmosphere from vehicles traveling on paved roadways.

Long-term operational emissions associated with the proposed project were calculated using CalEEMod. The proposed project is a new 3,698-square-foot SAWCO headquarters and associated improvements and a 4,066-square-foot maintenance building, maintenance yard, driveway, parking, solar cover, and landscaping. The SAWCO headquarters was represented in CalEEMod as a *Government Office Building* and the maintenance building as an *Automotive Care Center*. Additionally, a 1.19-acre parking lot was specified to include all pavement onsite and the driveway expansion. The trip generation rates were changed to match the Traffic Impact Analysis,[19] the natural gas use was set to zero with the electricity use increased to result in the same energy consumption, and all other parameters were left at CalEEMod defaults.

Table F provides the estimated existing emission estimates and the proposed project's estimated operational emissions.

[19] LSA Associates, Inc. (LSA). 2024. *Traffic Impact Analysis San Antonio Water Headquarters Project*. November.

Table F: Project Operational Emissions

Emission Type	Pollutant Emissions (lbs/day)					
	VOCs	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Mobile Sources	0.4	0.5	4.5	<0.1	1.1	0.3
Area Sources	0.2	<0.1	0.3	<0.1	<0.1	<0.1
Energy Sources	0	0	0	0	0	0
Total Project Emissions	**0.6**	**0.5**	**4.8**	**<0.1**	**1.1**	**0.3**
SCAQMD Threshold	55	55	550	150	150	55
Exceeds Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Source: Compiled by LSA (November 2024).
Note: The maximum of summer and winter modeling results were used to evaluate the operational emission impacts. CalEEMod output sheets are provided in Attachment B. Some values may not appear to add correctly due to rounding.
CO = carbon monoxide
lbs/day = pounds per day
NO_X = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
SCAQMD = South Coast Air Quality Management District
SO_X = sulfur oxides
VOCs = volatile organic compounds

The results shown in Table F indicate the proposed project would not exceed the significance criteria for daily VOC, NO_X, CO, SO_X, PM_{10}, or $PM_{2.5}$ emissions. Therefore, operation of the proposed project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under applicable NAAQS or CAAQS.

Long-Term Microscale (CO Hot-Spot) Analysis. Vehicular trips associated with the proposed project would contribute to congestion at intersections and along roadway segments in the vicinity of the proposed project site. Localized air quality impacts would occur when emissions from vehicular traffic increase as a result of the proposed project. The primary mobile-source pollutant of local concern is CO, a direct function of vehicle idling time and, thus, of traffic flow conditions. CO transport is extremely limited. Under normal meteorological conditions, it disperses rapidly with distance from the source. However, under certain extreme meteorological conditions, CO concentrations near a congested roadway or intersection may reach unhealthful levels, thereby affecting local sensitive receptors (e.g., residents, schoolchildren, the elderly, and hospital patients).

Typically, high CO concentrations are associated with roadways or intersections operating at unacceptable levels of service or with extremely high traffic volumes. In areas with high ambient background CO concentrations, modeling is recommended to determine a project's effect on local CO levels.

An assessment of project-related impacts on localized ambient air quality requires that future ambient air quality levels be projected. Existing CO concentrations in the immediate project vicinity are not available. Ambient CO levels monitored at the Fontana-Arrow Highway station (the closest station to the project site), showed a highest recorded 1-hour concentration of 1.9 ppm (the State standard is 20 ppm) and a highest 8-hour concentration of 1.4 ppm (the State standard is 9 ppm) from 2021 to 2023 (see Attachment C). The highest CO concentrations would normally occur during peak traffic hours; hence, CO impacts calculated under peak traffic conditions represent a worst-case analysis. Reduced speeds and vehicular congestion at intersections result in increased CO emissions.

The proposed project is expected to generate 85 new average daily trips, with 8 net new trips occurring in the a.m. peak hour and 10 net new trips occurring in the p.m. peak hour.[20] Therefore, given the extremely low level of CO concentrations in the project area and the lack of traffic impacts at any intersections, project-related vehicles are not expected to result in CO concentrations exceeding the State or federal CO standards. No CO hot spots would occur, and the project would not result in any project-related impacts on CO concentrations.

Localized Significance Thresholds Analysis

An LST analysis was completed to show the construction and operational impacts to the nearest sensitive receptors to the project site, based on a 4.92-acre daily disturbance area for construction and a 4.92-acre area for operations. As described in the Project Description section and in Table A, the nearest sensitive receptors are 90 feet to the west during construction and 300 feet to the north after construction during operations.

By design, the localized impact analysis only includes on-site sources; however, the CalEEMod outputs do not separate on-site and off-site emissions for mobile sources. For a worst-case scenario assessment, the emissions detailed in Table G assume all area- and energy-source emissions would occur on site, and 5 percent of the project-related new mobile sources (which is an estimate of the amount of project-related vehicle travel would occur on site). Considering the total trip length included in CalEEMod, the 5 percent assumption is conservative. Table G shows the results of the LST analysis during project construction and operation.

Table G: Project Localized Construction and Operational Emissions

Source	Pollutant Emissions (lbs/day)			
	NO_X	CO	PM_{10}	$PM_{2.5}$
Construction Emissions				
On-Site Emissions	14	15	3	2
Localized Significance Threshold	**270**	**2,230**	**18**	**9**
Significant?	**No**	**No**	**Yes**	**Yes**
Operational Emissions				
On-Site Emissions	<1	<1	<0.1	<0.1
Localized Significance Threshold	**361**	**4,742**	**18**	**5**
Significant?	**No**	**No**	**No**	**No**

Source: Compiled by LSA (November 2024).
Note: Source Receptor Area 32, emissions based on construction disturbing the entire site and operations occurring on the full project site. LSTs at a distance of 90 feet for construction and 300 feet for operations.
CO = carbon monoxide
lbs/day = pounds per day
NO_X = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size

As shown in Table G, the proposed project would not result in an exceedance of a SCAQMD LST during project construction or operation. During construction, construction contractors would be required to implement measures to reduce or eliminate emissions by implementing SCAQMD Rule

[20] LSA. 2024. *Traffic Impact Analysis San Antonio Water Headquarters Project*. November.

403 dust control measures.[21] In addition, the maximum daily emissions associated with project construction emissions are identified in Table E and indicate the project would not exceed the significance criteria for VOCs, NO, CO, SO_x, PM_{10}, or $PM_{2.5}$ emissions. Therefore, the emissions associated with construction of the proposed project would not be expected to exceed the most stringent applicable federal or State ambient air quality standards. It should be noted that the ambient air quality standards are developed and represent levels at which the most susceptible persons (children and the elderly) are protected. In other words, the ambient air quality standards are purposefully set low to protect children, the elderly, and those with existing respiratory problems. Therefore, given the temporary nature of short-term construction impacts, and the absence of any exceeded threshold of significance related to construction impacts, construction of the proposed project would not exceed SCAQMD thresholds and would not expose nearby sensitive receptors to substantial pollutant concentrations. No significant health risk would occur from project construction emissions.

Similarly, as indicated in Table F, operation of the proposed project would not exceed the significance criteria for VOCs, NO, CO, SO_x, PM_{10}, or $PM_{2.5}$ emissions.

The SCAQMD's numeric regional mass daily emissions thresholds are based in part on Section 180 (e) of the federal Clean Air Act. It should be noted that the numeric regional mass daily emissions thresholds have not changed since their adoption as part of SCAQMD's *CEQA Air Quality Handbook* published in 1993 (over 30 years ago).[22] The numeric regional mass daily emission thresholds are also intended to provide a means of consistency in significance determination within the environmental review process.

As noted in the Brief of Amicus Curiae by the SCAQMD,[23] the SCAQMD has acknowledged that for criteria pollutants, it would be extremely difficult, if not impossible, to quantify health impacts for various reasons, including modeling limitations as well as where in the atmosphere air pollutants interact and form.

Additionally, the SCAQMD acknowledges that health effects quantification from O_3, as an example, is correlated with the increases in ambient levels of O_3 in the air (concentration) that an individual person breathes. The SCAQMD goes on to state that it would take a large amount of additional emissions to result in a modeled increase in ambient O_3 levels over the entire region. The SCAQMD states that based on its own modeling in its 2012 AQMP,[24] a reduction of 432 tons (864,000 pounds) per day of NO_X and a reduction of 187 tons (374,000 pounds) per day of VOCs would reduce O_3 levels

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21 SCAQMD. 2024. South Coast AQMD Rule Book. Website: www.aqmd.gov/home/rules-compliance/rules (accessed November 2024).

22 SCAQMD. 1993. *CEQA Air Quality Handbook.* Website: www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/ceqa-air-quality-handbook-(1993) (accessed November 2024).

23 SCAQMD. 2015. *Amicus Curiae Brief of South Coast Air Quality Management District*. April. Website: www.courts.ca.gov/documents/9-s219783-ac-south-coast-air-quality-mgt-dist-041315.pdf (accessed November 2024).

24 SCAQMD. 2012. Final 2012 Air Quality Management Plan. Website: https://www.aqmd.gov/home/air-quality/air-quality-management-plans/air-quality-mgt-plan/final-2012-air-quality-management-plan (accessed November 2024).

at the highest monitored site by only 9 parts per billion (ppb). As such, the SCAQMD concludes that it is not currently possible to accurately quantify O_3-related health impacts caused by NO_X or VOC emissions from relatively small projects (defined as projects that are not regional in scope) due to photochemistry and regional model limitations (see page 11 of the SCAQMD Brief of Amicus Curiae).

To underscore this point, the SCAQMD goes on to state that it has only been able to correlate potential health outcomes for very large emissions sources. As part of its rulemaking activity, specifically 6,620 pounds per day (lbs/day) of NO_X and 89,180 lbs/day of VOCs were expected to result in approximately 20 premature deaths per year and 89,947 school absences due to O_3. As identified in Tables E and F, NO_X and VOC emissions during project construction and operation would be well below 6,620 lbs/day of NO_X and 89,180 lbs/day of VOCs.

Due to the small size of the proposed project in relation to the overall Basin, the level of emissions is not sufficiently high to use a regional modeling program to correlate health effects on a Basin-wide level. On a regional scale, the quantity of emissions from the project is incrementally minor. Because the SCAQMD has not identified any other methods to quantify health impacts from small projects and due to the size of the project, it is speculative to assign any specific health effects to small project-related emissions. However, based on this localized analysis, the proposed project would not expose sensitive receptors to substantial pollutant concentrations. Therefore, the project would not expose sensitive receptors to substantial levels of pollutant concentrations, impacts would be less than significant.

Odors

Heavy-duty equipment on the project site during construction would emit odors, primarily from equipment exhaust. However, the construction activity would cease after individual construction is completed. No other sources of objectionable odors have been identified for the proposed project during construction.

The proposed project would be required to comply with SCAQMD Rule 402. SCAQMD Rule 402 regarding nuisances states, "A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property."[25]

Examples of odor-generating projects are wastewater treatment plants, compost facilities, landfills, solid-waste transfer stations, fiberglass manufacturing facilities, paint/coating operations (e.g., auto body shops), dairy farms, petroleum refineries, asphalt batch plants, chemical manufacturing, and food manufacturing facilities. The proposed project would include a 1,350 sf Starbucks coffee shop with drive-through and associated improvements; therefore, the proposed project would not include land uses that would be expected to generate odors.

[25] SCAQMD. 2024. South Coast AQMD Rule Book. Website: www.aqmd.gov/home/rules-compliance/rules (accessed November 2024).

Once operational, the proposed project would involve minor odor-generating activities (e.g., trash, landscape equipment, application of exterior paints, etc.). However, unlike the odor-generating land uses identified above, these are not considered potential generators of odor that could affect a substantial number of people. Further, project-generated refuse would be stored in covered containers and would be removed at regular intervals to minimize odors. In addition, the proposed project be required to comply with the CalRecycle waste diversion program and recycling of solid and organic waste. Therefore, operational uses are not anticipated to emit any objectionable odors. Therefore, the proposed project would not result in other emissions (e.g., those leading to odors) adversely affecting a substantial number of people.

Greenhouse Gas Emission Impacts

The following sections describe the proposed project's construction- and operation-related GHG impacts and consistency with applicable GHG reduction plans.

Generation of Greenhouse Gas Emissions

This section describes the proposed project's construction- and operation-related GHG emissions and contribution to global climate change. The SCAQMD has not addressed emission thresholds for construction in its *CEQA Air Quality Handbook*; however, SCAQMD requires quantification and disclosure. Thus, this section discusses construction emissions.

Construction Greenhouse Gas Emissions. Construction activities associated with the proposed project would produce combustion emissions from various sources. Construction would emit GHGs through the operation of construction equipment and from worker and builder supply vendor vehicles for the duration of the approximately 15-month construction period. The combustion of fossil-based fuels creates GHGs such as CO_2, CH_4, and N_2O. Furthermore, the fueling of heavy equipment emits CH_4. Exhaust emissions from on-site construction activities would vary daily as construction activity levels change.

As indicated above, SCAQMD does not have an adopted threshold of significance for construction-related GHG emissions. However, lead agencies are required to quantify and disclose GHG emissions that would occur during construction. The SCAQMD then requires the construction GHG emissions to be amortized over the life of the project (which is defined as 30 years), added to the operational emissions, and compared to the applicable interim GHG significance threshold tier. Based on CalEEMod, it is estimated that the project would generate 396 MT CO_2e during construction of the project. When amortized over the 30-year life of the project, annual emissions would be 13 MT CO_2e.

Operational Greenhouse Gas Emissions. Long-term GHG emissions are typically generated from mobile sources (e.g., cars, trucks, and buses), area sources (e.g., maintenance activities and landscaping), indirect emissions from sources associated with energy consumption, and refrigerant fugitive emissions.

As described in the Project Description section above, the proposed project is a new 3,698-square-foot SAWCO headquarters and associated improvements and a 4,066-square-foot maintenance building, maintenance yard, driveway, parking, solar cover, and landscaping.

As discussed in the traffic memorandum[26] for the proposed project, upon completion of construction activities, operation of the proposed project would result in approximately 85 new daily vehicle trips.

GHG emissions were estimated using CalEEMod. Table H shows the estimated operational GHG emissions for the proposed project. Motor vehicle emissions are the largest source of GHG emissions for the project, at approximately 49 percent of the project total. Refrigerant sources are the next largest category, at approximately 35 percent. Energy, water, and waste sources represent approximately 14 percent, 1 percent, and 2 percent of the total emissions, respectively. Area sources make up less than 1 percent of the total emissions.

Table H: Greenhouse Gas Emissions

Emission Type	Operational Emissions (MT/yr)					
	CO_2	CH_4	N_2O	Refrigerant	CO_2e	Percentage of Total
Mobile Source	190	<0.1	<0.1	—	193	49
Area Source	<1	<0.1	<0.1	—	<1	<1
Energy Source	55	<0.1	<0.1	—	56	14
Water Source	3	<0.1	<0.1	—	4	1
Waste Source	2	<0.1	<0.1	—	6	2
Refrigerant Source	—	—	—	140	140	35
Total Operational Emissions						**399**
Amortized Construction Emissions						13
Total Annual Emissions						**412**
SCAQMD Threshold						**3,000**
Exceedance?						**No**

Source: Compiled by LSA (November 2024).
Note: Figures may not appear to add correctly due to rounding.
CH_4 = methane
CO_2 = carbon dioxide
CO_2e = carbon dioxide equivalent
MT/yr = metric tons per year
N_2O = nitrous oxide
SCAQMD = South Coast Air Quality Management District

As discussed above, a project would have less than significant GHG emissions if it would result in operational-related GHG emissions of less than 3,000 MT CO_2e per year. Based on the analysis results, the proposed project would result in approximately 412 MT CO_2e per year, which would not exceed the SCAQMD threshold of 3,000 MT CO_2e per year. Therefore, project-level and cumulative GHG emissions would be less than significant, and operation of the proposed project would not generate GHG emissions that would have a significant effect on the environment.

Consistency with Greenhouse Gas Reduction Plans

The following discussion evaluates the proposed project according to the goals of the 2022 Scoping Plan and SCAG's 2020–2045 RTP/SCS.

2022 Scoping Plan. EO B-30-15 added the immediate target of reducing GHG emissions to 40 percent below 1990 levels by 2030. SB 32 affirms the importance of addressing climate change by

[26] LSA. 2024. *Traffic Impact Analysis San Antonio Water Headquarters Project*. November.

codifying into statute the GHG emissions reduction target of at least 40 percent below 1990 levels by 2030 contained in EO B-30-15. CARB released the 2017 Scoping Plan to reflect the 2030 target set by EO B-30-15 and codified by SB 32.[27] SB 32 builds on AB 32 and keeps California on the path toward achieving the State's 2050 objective of reducing emissions to 80 percent below 1990 levels. AB 197, the companion bill to SB 32, provides additional direction to CARB that is related to the adoption of strategies to reduce GHG emissions. Additional direction in AB 197 that is intended to provide easier public access to air emission data collected by CARB was posted in December 2016. AB 1279 codifies the State goals of achieving net carbon neutrality by 2045 and maintaining net negative GHG emissions thereafter.

In addition, the 2022 Scoping Plan[28] assesses progress toward the statutory 2030 target while laying out a path to achieving carbon neutrality no later than 2045. The 2022 Scoping Plan focuses on outcomes needed to achieve carbon neutrality by assessing paths for clean technology, energy deployment, natural and working lands, and others, and is designed to meet the State's long-term climate objectives and support a range of economic, environmental, energy security, environmental justice, and public health priorities.

The 2022 Scoping Plan focuses on building clean energy production and distribution infrastructure for a carbon-neutral future, including transitioning existing energy production and transmission infrastructure to produce zero-carbon electricity and hydrogen, and utilizing biogas resulting from wildfire management or landfill and dairy operations, among other substitutes. The 2022 Scoping Plan states that in almost all sectors, electrification will play an important role. The 2022 Scoping Plan evaluates clean energy and technology options and the transition away from fossil fuels, including adding four times the solar and wind capacity by 2045 and about 1,700 times the amount of current hydrogen supply. As discussed in the 2022 Scoping Plan, EO N-79-20 requires that all new passenger vehicles sold in California be zero-emission by 2035 and that all other fleets transition to zero-emission as fully as possible by 2045, which will reduce the percentage of fossil fuel combustion vehicles.

- **Energy-efficient measures** are intended to maximize energy efficiency building and appliance standards, pursue additional efficiency efforts including new technologies and new policy and implementation mechanisms, and pursue comparable investment in energy efficiency from all retail providers of electricity in California. In addition, these measures are designed to expand the use of green building practices to reduce the carbon footprint of California's new and existing inventory of buildings. The proposed project would develop an existing undeveloped portion of SAWCO land into new SAWCO headquarters. As mentioned above, the proposed project would not be powered by natural gas, and no natural gas would be used during construction or operation of the proposed project. The elimination of natural gas in new development would help projects implement their "fair share" of achieving long-term 2045 carbon neutrality consistent with State goals. As such, if a project does not use natural gas, a lead agency can conclude that it would be consistent with achieving the 2045 neutrality goal and

[27] CARB. 2022. *2022 Scoping Plan for Achieving Carbon Neutrality.* December. Website: ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf (accessed November 2024).

[28] CARB. 2017. *California's 2017 Climate Change Scoping Plan*. November.

will not have a cumulative considerable impact on climate change. The proposed project does not include natural gas. In addition, the proposed project would comply with the latest Title 24 standards regarding energy conservation and green building standards. Therefore, the proposed project would comply with applicable energy measures.

- **Water conservation and efficiency measures** are intended to continue efficiency programs and use cleaner energy sources to move and treat water. Increasing the efficiency of water transport and reducing water use would reduce GHG emissions. As noted above, the project would be required to comply with the latest Title 24 standards, which include a variety of different measures, including reduction of wastewater and water use. The proposed project would also include low water landscape in their design. In addition, the proposed project would be required to comply with the California Model Water Efficient Landscape Ordinance. Therefore, the proposed project would not conflict with any of the water conservation and efficiency measures.

- The goal of **transportation and motor vehicle measures** is to develop regional GHG emissions reduction targets for passenger vehicles. Specific regional emission targets for transportation emissions would not directly apply to the proposed project. However, vehicles traveling to the project site would comply with the Pavley II (LEV III) Advanced Clean Cars Program. The second phase of Pavley standards reduces GHG emissions from new cars by 34 percent from 2016 levels by 2025, resulted in a 3 percent decrease in average vehicle emissions for all vehicles as of 2020. Therefore, the proposed project would not conflict with the identified transportation and motor vehicle measures.

The proposed project would comply with existing State regulations adopted to achieve the overall GHG emission reduction goals identified in the 2022 Scoping Plan, EO B-30-15, SB 32, AB 197, and AB 1279.

SCAG's Regional Transportation Plan/Sustainable Communities Strategy. SCAG's 2024–2050 RTP/SCS[29] identifies land use strategies that focus on new housing and job growth in areas served by high-quality transit, and other opportunity areas would be consistent with a land use development pattern that supports and complements the proposed transportation network. The core vision in the 2024–2050 RTP/SCS is to better manage the existing transportation system through design management strategies, integrate land use decisions and technological advancements, create complete streets that are safe for all roadway users, preserve the transportation system, and expand transit and foster development in transit-oriented communities. The 2024–2050 RTP/SCS contains transportation projects to help more efficiently distribute population, housing, and employment growth, as well as providing a forecast development pattern that is generally consistent with regional-level General Plan data. The forecast development pattern, when integrated with the financially constrained transportation investments identified in the 2024–2050 RTP/SCS, would reach the regional target of reducing GHG emissions from automobiles and light-duty trucks by 8 percent by 2020 and 19 percent by 2035 (compared to 2005 levels per capita

[29] SCAG. 2020. *Connect SoCal: The 2020–2045 Regional Transportation Plan/Sustainable Communities Strategy of the Southern California Association of Governments*. Website: scag.ca.gov/sites/main/files/file-attachments/0903fconnectsocal-plan_0.pdf?1606001176 (accessed November 2024).

emission levels). The 2024–2050 RTP/SCS does not require that local General Plans, Specific Plans, or zoning be consistent with the 2024–2050 RTP/SCS, but it provides incentives for consistency for governments and developers.

Implementing SCAG's RTP/SCS will greatly reduce the regional GHG emissions from transportation, helping to achieve statewide emissions reduction targets. As demonstrated in the Consistency with Applicable Air Quality Plans section, the proposed project does not meet the criteria identified in *State CEQA Guidelines* Section 15205.b.2 (Projects of Statewide, Regional, or Areawide Significance) for projects of statewide, regional, or areawide significance. In addition, while the proposed project would require a change to the General Plan land use designation and the current zoning, the City plans to update both the General Plan and zoning to accommodate the project. As demonstrated in Table H, the proposed project would not generate significant levels of GHGs, thus would not interfere with SCAG's ability to achieve the region's GHG reduction target of 19 percent below 2005 per capita emissions levels by 2035. Furthermore, the proposed project is not regionally significant per *State CEQA Guidelines* Section 15206, and, as such, it would not conflict with the SCAG RTP/SCS targets since those targets were established and are applicable on a regional level.

CONCLUSION

Based on the analysis presented above, construction and operation of the proposed project would not result in the generation of criteria air pollutants that would exceed SCAQMD thresholds of significance. Compliance with SCAQMD Rule 403: Fugitive Dust[30] would further reduce construction dust impacts. Emissions released during construction of the proposed project are estimated to be minimal and would not be cumulatively considerable. The proposed project is not expected to produce significant emissions that would affect nearby sensitive receptors. The proposed project would also not result in objectionable odors affecting a substantial number of people. GHG emissions released during construction and operation of the project are estimated to be minimal and would not be cumulatively considerable. In addition, the proposed project would generally be consistent with both the CARB Scoping Plan[31] and the SCAG RTP/SCS.[32]

Attachments: A: Figures
B: CalEEMod Output
C: Fontana-Arrow Highway Air Quality Monitoring Data

30 SCAQMD. 2024. South Coast AQMD Rule Book. Website: www.aqmd.gov/home/rules-compliance/rules (accessed November 2024).

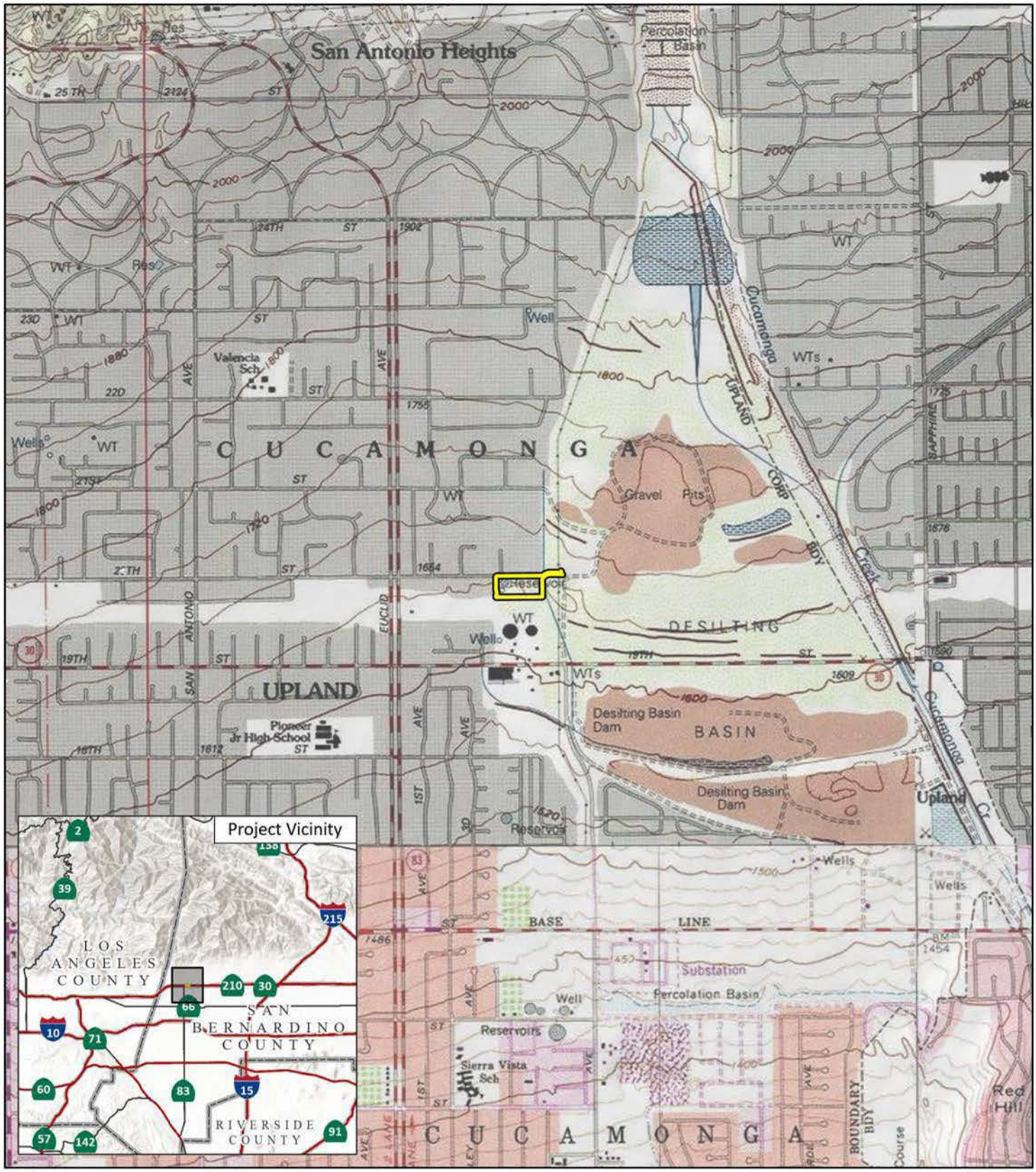
31 CARB. 2022. *2022 Scoping Plan for Achieving Carbon Neutrality.* December. Website: ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf (accessed November 2024).

32 SCAG. 2020. *Connect SoCal: The 2020–2045 Regional Transportation Plan/Sustainable Communities Strategy of the Southern California Association of Governments*. Website: scag.ca.gov/sites/main/files/file-attachments/0903fconnectsocal-plan_0.pdf?1606001176 (accessed November 2024).

ATTACHMENT A

FIGURES

Figure 1: Project Location and Vicinity
Figure 2: Site Plan
Figure 3: Project Location



LSA

FIGURE 1

0 1000 2000
FEET

San Antonio Water Company Headquarters

Project Location and Vicinity

SOURCE: *Mt. Baldy CA*, 7.5' Quad (USGS 1988)

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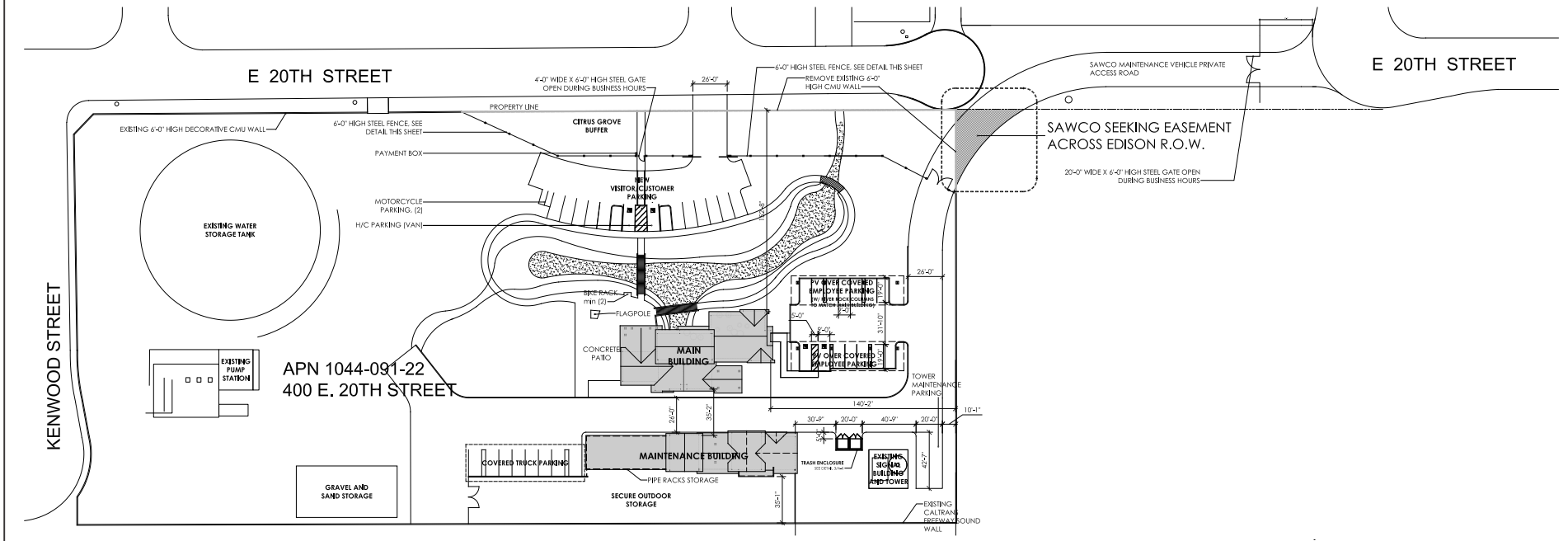

LSA

FIGURE 2

N

0 60 120

FEET

SOURCE: CEDG, Inc.

San Antonio Water Company Headquarters

Conceptual Site Plan

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LSA

Project Location

FIGURE 3

0 100 200
FEET

SOURCE: Google Imagery (2024)

San Antonio Water Company Headquarters

Project Location

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ATTACHMENT B

CALEEMOD OUTPUT

San Antonio Water HQ Custom Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

1.2. Land Use Types

1.3. User-Selected Emission Reduction Measures by Emissions Sector

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

2.2. Construction Emissions by Year, Unmitigated

2.4. Operations Emissions Compared Against Thresholds

2.5. Operations Emissions by Sector, Unmitigated

3. Construction Emissions Details

3.1. Site Preparation (2025) - Unmitigated

3.3. Grading (2025) - Unmitigated

3.5. Building Construction (2025) - Unmitigated

3.7. Building Construction (2026) - Unmitigated

3.9. Paving (2026) - Unmitigated

3.11. Architectural Coating (2026) - Unmitigated

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

4.3. Area Emissions by Source

4.3.1. Unmitigated

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

5. Activity Data

5.1. Construction Schedule

5.2. Off-Road Equipment

5.2.1. Unmitigated

5.3. Construction Vehicles

5.3.1. Unmitigated

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

5.5. Architectural Coatings

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

5.6.2. Construction Earthmoving Control Strategies

5.7. Construction Paving

5.8. Construction Electricity Consumption and Emissions Factors

5.9. Operational Mobile Sources

5.9.1. Unmitigated

5.10. Operational Area Sources

5.10.2. Architectural Coatings

5.10.3. Landscape Equipment

5.11. Operational Energy Consumption

5.11.1. Unmitigated

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

5.13. Operational Waste Generation

5.13.1. Unmitigated

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	San Antonio Water HQ
Construction Start Date	4/1/2025
Operational Year	2026
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.80
Precipitation (days)	2.20
Location	34.13563245525083, -117.64489903150591
County	San Bernardino-South Coast
City	Upland
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5225
EDFZ	10
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.28

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Government Office Building	3.70	1000sqft	0.08	3,698	26,077	0.00	—	Main Building

Automobile Care Center	4.07	1000sqft	0.09	4,066	20,000	0.00	—	Maintenance Building
Parking Lot	51.7	1000sqft	1.19	0.00	0.00	0.00	—	Total Paving

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.56	14.1	15.3	0.02	0.64	1.97	2.62	0.59	0.92	1.51	—	2,596	2,596	0.11	0.03	0.95	2,606
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.47	9.55	12.1	0.02	0.33	0.25	0.56	0.30	0.06	0.35	—	2,201	2,201	0.09	0.03	0.02	2,212
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.79	5.38	7.15	0.01	0.19	0.15	0.33	0.17	0.04	0.21	—	1,266	1,266	0.05	0.02	0.24	1,273
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.14	0.98	1.31	< 0.005	0.03	0.03	0.06	0.03	0.01	0.04	—	210	210	0.01	< 0.005	0.04	211
Exceeds (Daily Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	75.0	100	550	150	—	—	150	—	—	55.0	—	—	—	—	—	—	—
Unmit.	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—

Exceeds (Average Daily)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	75.0	100	550	150	—	—	150	—	—	55.0	—	—	—	—	—	—	—
Unmit.	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	1.56	14.1	15.3	0.02	0.64	1.97	2.62	0.59	0.92	1.51	—	2,596	2,596	0.11	0.03	0.95	2,606
2026	1.48	9.54	12.4	0.02	0.32	0.25	0.56	0.29	0.06	0.35	—	2,222	2,222	0.09	0.03	0.95	2,234
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	1.14	9.07	11.0	0.02	0.33	0.22	0.55	0.30	0.05	0.35	—	2,047	2,047	0.09	0.03	0.02	2,058
2026	1.47	9.55	12.1	0.02	0.32	0.25	0.56	0.29	0.06	0.35	—	2,201	2,201	0.08	0.03	0.02	2,212
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.62	4.96	6.01	0.01	0.18	0.15	0.33	0.17	0.04	0.21	—	1,111	1,111	0.05	0.02	0.22	1,117
2026	0.79	5.38	7.15	0.01	0.19	0.15	0.33	0.17	0.04	0.21	—	1,266	1,266	0.05	0.02	0.24	1,273
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.11	0.91	1.10	< 0.005	0.03	0.03	0.06	0.03	0.01	0.04	—	184	184	0.01	< 0.005	0.04	185
2026	0.14	0.98	1.31	< 0.005	0.03	0.03	0.06	0.03	0.01	0.04	—	210	210	0.01	< 0.005	0.04	211

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.61	0.46	4.84	0.01	0.01	1.04	1.05	0.01	0.26	0.27	12.4	1,567	1,579	1.31	0.06	847	2,477
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.53	0.49	3.66	0.01	0.01	1.04	1.05	0.01	0.26	0.27	12.4	1,489	1,501	1.31	0.06	843	2,395
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.57	0.50	4.04	0.01	0.01	1.04	1.05	0.01	0.26	0.27	12.4	1,502	1,514	1.31	0.06	845	2,410
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.10	0.09	0.74	< 0.005	< 0.005	0.19	0.19	< 0.005	0.05	0.05	2.05	249	251	0.22	0.01	140	399
Exceeds (Daily Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	55.0	55.0	550	150	—	—	150	—	—	55.0	—	—	—	—	—	—	—
Unmit.	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—
Exceeds (Average Daily)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	55.0	55.0	550	150	—	—	150	—	—	55.0	—	—	—	—	—	—	—
Unmit.	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—
Exceeds (Annual)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3,000
Unmit.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	No

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.37	0.45	4.51	0.01	0.01	1.04	1.05	0.01	0.26	0.27	—	1,214	1,214	0.05	0.05	4.18	1,234
Area	0.24	< 0.005	0.34	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.39	1.39	< 0.005	< 0.005	—	1.39
Energy	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	335	335	0.02	< 0.005	—	336
Water	—	—	—	—	—	—	—	—	—	—	2.14	16.8	18.9	0.22	0.01	—	26.1
Waste	—	—	—	—	—	—	—	—	—	—	10.2	0.00	10.2	1.02	0.00	—	35.8
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	843	843
Total	0.61	0.46	4.84	0.01	0.01	1.04	1.05	0.01	0.26	0.27	12.4	1,567	1,579	1.31	0.06	847	2,477
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.35	0.49	3.66	0.01	0.01	1.04	1.05	0.01	0.26	0.27	—	1,137	1,137	0.05	0.05	0.11	1,154
Area	0.18	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	335	335	0.02	< 0.005	—	336
Water	—	—	—	—	—	—	—	—	—	—	2.14	16.8	18.9	0.22	0.01	—	26.1
Waste	—	—	—	—	—	—	—	—	—	—	10.2	0.00	10.2	1.02	0.00	—	35.8
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	843	843
Total	0.53	0.49	3.66	0.01	0.01	1.04	1.05	0.01	0.26	0.27	12.4	1,489	1,501	1.31	0.06	843	2,395
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.35	0.50	3.81	0.01	0.01	1.04	1.05	0.01	0.26	0.27	—	1,149	1,149	0.05	0.05	1.80	1,168
Area	0.22	< 0.005	0.23	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.95	0.95	< 0.005	< 0.005	—	0.95
Energy	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	335	335	0.02	< 0.005	—	336
Water	—	—	—	—	—	—	—	—	—	—	2.14	16.8	18.9	0.22	0.01	—	26.1
Waste	—	—	—	—	—	—	—	—	—	—	10.2	0.00	10.2	1.02	0.00	—	35.8

Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	843	843
Total	0.57	0.50	4.04	0.01	0.01	1.04	1.05	0.01	0.26	0.27	12.4	1,502	1,514	1.31	0.06	845	2,410
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.06	0.09	0.70	< 0.005	< 0.005	0.19	0.19	< 0.005	0.05	0.05	—	190	190	0.01	0.01	0.30	193
Area	0.04	< 0.005	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.16	0.16	< 0.005	< 0.005	—	0.16
Energy	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	55.4	55.4	< 0.005	< 0.005	—	55.7
Water	—	—	—	—	—	—	—	—	—	—	0.35	2.78	3.14	0.04	< 0.005	—	4.31
Waste	—	—	—	—	—	—	—	—	—	—	1.69	0.00	1.69	0.17	0.00	—	5.92
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	140	140
Total	0.10	0.09	0.74	< 0.005	< 0.005	0.19	0.19	< 0.005	0.05	0.05	2.05	249	251	0.22	0.01	140	399

3. Construction Emissions Details

3.1. Site Preparation (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.31	12.1	12.1	0.02	0.56	—	0.56	0.52	—	0.52	—	2,065	2,065	0.08	0.02	—	2,072
Dust From Material Movement	—	—	—	—	—	1.63	1.63	—	0.78	0.78	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.07	0.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	11.3	11.3	< 0.005	< 0.005	—	11.4
Dust From Material Movement	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.87	1.87	< 0.005	< 0.005	—	1.88
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.58	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	106	106	< 0.005	< 0.005	0.39	107
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.54	0.54	< 0.005	< 0.005	< 0.005	0.55
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.09	0.09	< 0.005	< 0.005	< 0.005	0.09
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.3. Grading (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.51	14.1	14.5	0.02	0.64	—	0.64	0.59	—	0.59	—	2,455	2,455	0.10	0.02	—	2,463
Dust From Material Movement	—	—	—	—	—	1.84	1.84	—	0.89	0.89	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.15	0.16	< 0.005	0.01	—	0.01	0.01	—	0.01	—	26.9	26.9	< 0.005	< 0.005	—	27.0
Dust From Material Movement	—	—	—	—	—	0.02	0.02	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	< 0.005	0.03	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.45	4.45	< 0.005	< 0.005	—	4.47
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.04	0.78	0.00	0.00	0.13	0.13	0.00	0.03	0.03	—	141	141	0.01	< 0.005	0.52	143
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.44	1.44	< 0.005	< 0.005	< 0.005	1.46
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.24	0.24	< 0.005	< 0.005	< 0.005	0.24
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.5. Building Construction (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.07	8.95	10.0	0.02	0.33	—	0.33	0.30	—	0.30	—	1,801	1,801	0.07	0.01	—	1,807
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.07	8.95	10.0	0.02	0.33	—	0.33	0.30	—	0.30	—	1,801	1,801	0.07	0.01	—	1,807
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.56	4.67	5.24	0.01	0.17	—	0.17	0.16	—	0.16	—	941	941	0.04	0.01	—	944
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	0.85	0.96	< 0.005	0.03	—	0.03	0.03	—	0.03	—	156	156	0.01	< 0.005	—	156
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	1.25	0.00	0.00	0.21	0.21	0.00	0.05	0.05	—	225	225	0.01	0.01	0.84	229
Vendor	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	39.3	39.3	< 0.005	0.01	0.11	41.2
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.07	0.08	0.94	0.00	0.00	0.21	0.21	0.00	0.05	0.05	—	207	207	0.01	0.01	0.02	209
Vendor	< 0.005	0.05	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	39.3	39.3	< 0.005	0.01	< 0.005	41.1
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.52	0.00	0.00	0.11	0.11	0.00	0.03	0.03	—	110	110	0.01	< 0.005	0.19	111
Vendor	< 0.005	0.02	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	20.5	20.5	< 0.005	< 0.005	0.03	21.5
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.09	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	18.1	18.1	< 0.005	< 0.005	0.03	18.4
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.40	3.40	< 0.005	< 0.005	< 0.005	3.56
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.7. Building Construction (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.01	8.57	9.96	0.02	0.29	—	0.29	0.27	—	0.27	—	1,801	1,801	0.07	0.01	—	1,807
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.01	8.57	9.96	0.02	0.29	—	0.29	0.27	—	0.27	—	1,801	1,801	0.07	0.01	—	1,807
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.47	3.97	4.62	0.01	0.14	—	0.14	0.12	—	0.12	—	835	835	0.03	0.01	—	838
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.73	0.84	< 0.005	0.02	—	0.02	0.02	—	0.02	—	138	138	0.01	< 0.005	—	139
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	1.15	0.00	0.00	0.21	0.21	0.00	0.05	0.05	—	221	221	0.01	0.01	0.76	224
Vendor	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	38.6	38.6	< 0.005	0.01	0.10	40.5
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.07	0.87	0.00	0.00	0.21	0.21	0.00	0.05	0.05	—	203	203	< 0.005	0.01	0.02	205
Vendor	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	38.6	38.6	< 0.005	0.01	< 0.005	40.5
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.04	0.42	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	95.3	95.3	< 0.005	< 0.005	0.15	96.5
Vendor	< 0.005	0.02	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	17.9	17.9	< 0.005	< 0.005	0.02	18.8
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.08	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	15.8	15.8	< 0.005	< 0.005	0.03	16.0
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.96	2.96	< 0.005	< 0.005	< 0.005	3.11

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.9. Paving (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.47	4.41	6.48	0.01	0.18	—	0.18	0.17	—	0.17	—	991	991	0.04	0.01	—	995
Paving	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.47	4.41	6.48	0.01	0.18	—	0.18	0.17	—	0.17	—	991	991	0.04	0.01	—	995
Paving	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	0.94	1.38	< 0.005	0.04	—	0.04	0.04	—	0.04	—	212	212	0.01	< 0.005	—	213
Paving	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.17	0.25	< 0.005	0.01	—	0.01	0.01	—	0.01	—	35.1	35.1	< 0.005	< 0.005	—	35.2

Paving	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.90	0.00	0.00	0.16	0.16	0.00	0.04	0.04	—	173	173	0.01	0.01	0.59	175
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.68	0.00	0.00	0.16	0.16	0.00	0.04	0.04	—	158	158	< 0.005	0.01	0.02	160
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.15	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	34.3	34.3	< 0.005	< 0.005	0.05	34.8
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.68	5.68	< 0.005	< 0.005	0.01	5.75
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.11. Architectural Coating (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.86	1.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	0.26	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.86	1.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	0.26	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.38	0.51	< 0.005	0.01	—	0.01	0.01	—	0.01	—	60.0	60.0	< 0.005	< 0.005	—	60.2
Architectural Coatings	0.12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.07	0.09	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	9.93	9.93	< 0.005	< 0.005	—	9.97
Architectural Coatings	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.14	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	27.6	27.6	< 0.005	< 0.005	0.09	28.0
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.11	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	25.3	25.3	< 0.005	< 0.005	< 0.005	25.6
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.05	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	11.5	11.5	< 0.005	< 0.005	0.02	11.7
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.91	1.91	< 0.005	< 0.005	< 0.005	1.94
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Government Office Building	0.32	0.39	3.87	0.01	0.01	0.89	0.90	0.01	0.23	0.23	—	1,042	1,042	0.04	0.04	3.59	1,060
Automobile Care Center	0.05	0.06	0.64	< 0.005	< 0.005	0.15	0.15	< 0.005	0.04	0.04	—	171	171	0.01	0.01	0.59	174
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.37	0.45	4.51	0.01	0.01	1.04	1.05	0.01	0.26	0.27	—	1,214	1,214	0.05	0.05	4.18	1,234
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Government Office Building	0.30	0.42	3.15	0.01	0.01	0.89	0.90	0.01	0.23	0.23	—	976	976	0.04	0.05	0.09	991
Automobile Care Center	0.05	0.07	0.52	< 0.005	< 0.005	0.15	0.15	< 0.005	0.04	0.04	—	160	160	0.01	0.01	0.02	163
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.35	0.49	3.66	0.01	0.01	1.04	1.05	0.01	0.26	0.27	—	1,137	1,137	0.05	0.05	0.11	1,154
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Government Office Building	0.05	0.08	0.60	< 0.005	< 0.005	0.16	0.16	< 0.005	0.04	0.04	—	163	163	0.01	0.01	0.26	166

Automobile Care Center	0.01	0.01	0.10	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	26.8	26.8	< 0.005	< 0.005	0.04	27.3
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.06	0.09	0.70	< 0.005	< 0.005	0.19	0.19	< 0.005	0.05	0.05	—	190	190	0.01	0.01	0.30	193

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Government Office Building	—	—	—	—	—	—	—	—	—	—	—	137	137	0.01	< 0.005	—	138
Automobile Care Center	—	—	—	—	—	—	—	—	—	—	—	131	131	0.01	< 0.005	—	132
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	66.1	66.1	< 0.005	< 0.005	—	66.3
Total	—	—	—	—	—	—	—	—	—	—	—	335	335	0.02	< 0.005	—	336
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Government Office Building	—	—	—	—	—	—	—	—	—	—	—	137	137	0.01	< 0.005	—	138

Automob Care Center	—	—	—	—	—	—	—	—	—	—	—	131	131	0.01	< 0.005	—	132
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	66.1	66.1	< 0.005	< 0.005	—	66.3
Total	—	—	—	—	—	—	—	—	—	—	—	335	335	0.02	< 0.005	—	336
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Governm ent Office Building	—	—	—	—	—	—	—	—	—	—	—	22.7	22.7	< 0.005	< 0.005	—	22.8
Automob ile Care Center	—	—	—	—	—	—	—	—	—	—	—	21.8	21.8	< 0.005	< 0.005	—	21.8
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	10.9	10.9	< 0.005	< 0.005	—	11.0
Total	—	—	—	—	—	—	—	—	—	—	—	55.4	55.4	< 0.005	< 0.005	—	55.7

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Governm ent Office Building	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Automob ile Care Center	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

Total	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Government Office Building	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Automobile Care Center	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Government Office Building	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Automobile Care Center	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.06	< 0.005	0.34	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.39	1.39	< 0.005	< 0.005	—	1.39
Total	0.24	< 0.005	0.34	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.39	1.39	< 0.005	< 0.005	—	1.39
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	0.18	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.01	< 0.005	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.16	0.16	< 0.005	< 0.005	—	0.16
Total	0.04	< 0.005	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.16	0.16	< 0.005	< 0.005	—	0.16

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Government Office Building	—	—	—	—	—	—	—	—	—	—	1.41	10.5	11.9	0.15	< 0.005	—	16.6
Automobile Care Center	—	—	—	—	—	—	—	—	—	—	0.73	6.28	7.01	0.08	< 0.005	—	9.45
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	2.14	16.8	18.9	0.22	0.01	—	26.1
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Government Office Building	—	—	—	—	—	—	—	—	—	—	1.41	10.5	11.9	0.15	< 0.005	—	16.6
Automobile Care Center	—	—	—	—	—	—	—	—	—	—	0.73	6.28	7.01	0.08	< 0.005	—	9.45
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	2.14	16.8	18.9	0.22	0.01	—	26.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Governm Office Building	—	—	—	—	—	—	—	—	—	—	0.23	1.74	1.98	0.02	< 0.005	—	2.75
Automob ile Care Center	—	—	—	—	—	—	—	—	—	—	0.12	1.04	1.16	0.01	< 0.005	—	1.56
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	0.35	2.78	3.14	0.04	< 0.005	—	4.31

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Governm ent Office Building	—	—	—	—	—	—	—	—	—	—	1.85	0.00	1.85	0.19	0.00	—	6.48
Automob ile Care Center	—	—	—	—	—	—	—	—	—	—	8.37	0.00	8.37	0.84	0.00	—	29.3
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	10.2	0.00	10.2	1.02	0.00	—	35.8
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Government	—	—	—	—	—	—	—	—	—	—	1.85	0.00	1.85	0.19	0.00	—	6.48
Automobile Care Center	—	—	—	—	—	—	—	—	—	—	8.37	0.00	8.37	0.84	0.00	—	29.3
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	10.2	0.00	10.2	1.02	0.00	—	35.8
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Government Office Building	—	—	—	—	—	—	—	—	—	—	0.31	0.00	0.31	0.03	0.00	—	1.07
Automobile Care Center	—	—	—	—	—	—	—	—	—	—	1.39	0.00	1.39	0.14	0.00	—	4.85
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	1.69	0.00	1.69	0.17	0.00	—	5.92

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Government Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.01	0.01

Automob Care Center	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	843	843
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	843	843
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Governm ent Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.01	0.01
Automob ile Care Center	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	843	843
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	843	843
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Governm ent Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	< 0.005	< 0.005
Automob ile Care Center	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	140	140
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	140	140

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Site Preparation	Site Preparation	4/1/2025	4/2/2025	5.00	2.00	—
Grading	Grading	4/3/2025	4/8/2025	5.00	4.00	—
Building Construction	Building Construction	4/9/2025	8/25/2026	5.00	360	—

Paving	Paving	8/26/2026	12/11/2026	5.00	78.0	—
Architectural Coating	Architectural Coating	3/1/2026	10/15/2026	5.00	164	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Graders	Diesel	Average	1.00	8.00	148	0.41
Site Preparation	Rubber Tired Dozers	Diesel	Average	1.00	7.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	7.00	84.0	0.37
Building Construction	Cranes	Diesel	Average	1.00	6.00	367	0.29
Building Construction	Forklifts	Diesel	Average	1.00	6.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	1.00	6.00	84.0	0.37
Building Construction	Welders	Diesel	Average	3.00	8.00	46.0	0.45
Paving	Cement and Mortar Mixers	Diesel	Average	1.00	6.00	10.0	0.56
Paving	Pavers	Diesel	Average	1.00	6.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	1.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	1.00	7.00	36.0	0.38
Paving	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site Preparation	—	—	—	—
Site Preparation	Worker	7.50	18.5	LDA,LDT1,LDT2
Site Preparation	Vendor	—	10.2	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	10.0	18.5	LDA,LDT1,LDT2
Grading	Vendor	—	10.2	HHDT,MHDT
Grading	Hauling	0.00	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	16.0	18.5	LDA,LDT1,LDT2
Building Construction	Vendor	1.27	10.2	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	12.5	18.5	LDA,LDT1,LDT2
Paving	Vendor	—	10.2	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	2.00	18.5	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	10.2	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT

Architectural Coating	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Control Strategies Applied	PM10 Reduction	PM2.5 Reduction
Water unpaved roads twice daily	55%	55%
Limit vehicle speeds on unpaved roads to 25 mph	44%	44%
Sweep paved roads once per month	9%	9%

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	0.00	0.00	11,646	3,882	3,104

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Site Preparation	0.00	0.00	1.88	0.00	—
Grading	0.00	0.00	4.00	0.00	—
Paving	0.00	0.00	0.00	0.00	1.19

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	3	74%	74%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Government Office Building	0.00	0%
Automobile Care Center	0.00	0%
Parking Lot	1.19	36%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2025	0.00	532	0.03	< 0.005
2026	0.00	532	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Government Office Building	73.0	73.0	73.0	26,644	1,258	1,258	1,258	459,062
Automobile Care Center	12.0	12.0	12.0	4,378	207	207	207	75,430
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.10. Operational Area Sources

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
0	0.00	11,646	3,882	3,104

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	250

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Government Office Building	94,277	532	0.0330	0.0040	0.00
Automobile Care Center	90,187	532	0.0330	0.0040	0.00
Parking Lot	45,321	532	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Government Office Building	734,644	418,774
Automobile Care Center	382,534	321,182
Parking Lot	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Government Office Building	3.44	—

Automobile Care Center	15.5	—
Parking Lot	0.00	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Government Office Building	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
Government Office Building	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Automobile Care Center	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Automobile Care Center	Supermarket refrigeration and condensing units	R-404A	3,922	26.5	16.5	16.5	18.0

8. User Changes to Default Data

Screen	Justification
Construction: Construction Phases	No demolition planned. Construction from 4/25 thru 12/26. Assumed architectural coatings applied during the building construction and paving phases.
Construction: Architectural Coatings	Assume all architectural coatings comply with SCAQMD Rule 1113.
Construction: Paving	Project plans specify 33,312sf of concrete and 18,424sf of asphalt.
Operations: Vehicle Data	Trip rates per traffic study - 20 employee, 12 maintenance truck, and 53 customer trips per day. Assigned all employee and customer trips to the Govt Office Bldg.
Operations: Architectural Coatings	Assumed all architectural coatings comply with SCAQMD Rule 1113.
Construction: Trips and VMT	Adjusted worker trips from defaults to expected amounts.
Operations: Energy Use	No natural gas use allowed, adjusted electricity use up to compensate. Used 1 kWh = 3,412 BTU of natural gas.

ATTACHMENT C

FONTANA-ARROW HIGHWAY AIR QUALITY MONITORING DATA

Fontana-Arrow Highway Air Quality Monitoring Data

2021 Monitoring Data

Parameter Name	Duration Description	Pollutant Standard	Units of Measure	Arithmetic Mean	First Maximum Value	Second Maximum Value	Third Maximum Value	Fourth Maximum Value	50th Perecentile	75th Perecentile	90th Perecentile	95th Perecentile	98th Perecentile	99th Perecentile	Address
Carbon monoxide	1 HOUR	CO 1-hour 1971	Parts per million	0.283842	1.9	1.9	1.7	1.5	0.2	0.4	0.6	0.7	0.9	1	14360 ARROW BLVD., FONTANA
Carbon monoxide	8-HR RUN AVG E	CO 8-hour 1971	Parts per million	0.287105	1.4	1.4	1.3	1.3	0.2	0.4	0.6	0.7	0.8	0.9	14360 ARROW BLVD., FONTANA
Nitrogen dioxide (NO2)	1 HOUR	NO2 1-hour 2010	Parts per billion	34.070879	67.2	64.6	61.7	61.1	34.7	41.1	49.4	53.6	60.7	61.1	14360 ARROW BLVD., FONTANA
Nitrogen dioxide (NO2)	1 HOUR	NO2 Annual 1971	Parts per billion	18.951218	67.2	64.6	62.1	61.7	16.5	27.8	35.9	40.1	45.9	49.8	14360 ARROW BLVD., FONTANA
Ozone	1 HOUR	Ozone 1-hour 1979	Parts per million	0.06264	0.125	0.123	0.122	0.122	0.057	0.081	0.098	0.107	0.118	0.122	14360 ARROW BLVD., FONTANA
Ozone	8-HR RUN AVG E	Ozone 8-hour 2015	Parts per million	0.052427	0.103	0.101	0.101	0.099	0.05	0.069	0.081	0.089	0.094	0.099	14360 ARROW BLVD., FONTANA
PM10 Total 0-10um STP	24 HOUR	PM10 24-hour 2006	Micrograms/cubic n	32.886792	73	62	61	52	33	41	49	61	62	73	14360 ARROW BLVD., FONTANA
PM2.5 - Local Conditions	24 HOUR	PM25 24-hour 2012	Micrograms/cubic n	12.0975	55.1	43.7	33.4	33.4	11.3	14.2	16.9	29.4	33.4	43.7	14360 ARROW BLVD., FONTANA
PM2.5 - Local Conditions	24 HOUR	PM25 Annual 2012	Micrograms/cubic n	12.0975	55.1	43.7	33.4	33.4	11.3	14.2	16.9	29.4	33.4	43.7	14360 ARROW BLVD., FONTANA
Sulfur dioxide	1 HOUR	SO2 1-hour 2010	Parts per billion	0.552198	5	3.7	2.7	1.9	0.6	0.8	1	1.2	1.5	1.9	14360 ARROW BLVD., FONTANA
Sulfur dioxide	3-HR BLK AVG	SO2 3-hour 1971	Parts per billion	0.231348	2.7	2	1.5	1.2	0.3	0.4	0.6	0.7	0.8	0.9	14360 ARROW BLVD., FONTANA

2022 Monitoring Data

Parameter Name	Duration Description	Pollutant Standard	Units of Measure	Arithmetic Mean	First Maximum Value	Second Maximum Value	Third Maximum Value	Fourth Maximum Value	50th Perecentile	75th Perecentile	90th Perecentile	95th Perecentile	98th Perecentile	99th Perecentile	Address
Carbon monoxide	1 HOUR	CO 1-hour 1971	Parts per million	0.259474	1.6	1.5	1.5	1.3	0.2	0.3	0.5	0.6	0.8	0.9	14360 ARROW BLVD., FONTANA
Carbon monoxide	8-HR RUN AVG E	CO 8-hour 1971	Parts per million	0.263678	1.0	1.0	1.0	1.0	0.2	0.3	0.5	0.5	0.6	0.7	14360 ARROW BLVD., FONTANA
Nitrogen dioxide (NO2)	1 HOUR	NO2 1-hour 2010	Parts per billion	32.215042	68.7	55	53.2	52.5	33.8	40.1	45.2	48.7	50.5	52.5	14360 ARROW BLVD., FONTANA
Nitrogen dioxide (NO2)	1 HOUR	NO2 Annual 1971	Parts per billion	17.701232	68.7	55	53.2	52.8	15.3	26.4	34.1	37.9	41.7	44.2	14360 ARROW BLVD., FONTANA
Ozone	1 HOUR	Ozone 1-hour 1979	Parts per million	0.064081	0.144	0.122	0.121	0.119	0.06	0.083	0.098	0.106	0.115	0.119	14360 ARROW BLVD., FONTANA
Ozone	8-HR RUN AVG E	Ozone 8-hour 2015	Parts per million	0.053432	0.107	0.099	0.098	0.095	0.051	0.067	0.079	0.084	0.094	0.095	14360 ARROW BLVD., FONTANA
PM10 Total 0-10um STP	24 HOUR	PM10 24-hour 2006	Micrograms/cubic n	31.533333	62	62	60	58	29	43	53	60	62	62	14360 ARROW BLVD., FONTANA
PM2.5 - Local Conditions	24 HOUR	PM25 24-hour 2012	Micrograms/cubic n	10.915833	38.1	30.6	28.1	22.4	10.1	13.5	17.9	20.4	28.1	30.6	14360 ARROW BLVD., FONTANA
PM2.5 - Local Conditions	24 HOUR	PM25 Annual 2012	Micrograms/cubic n	10.915833	38.1	30.6	28.1	22.4	10.1	13.5	17.9	20.4	28.1	30.6	14360 ARROW BLVD., FONTANA
Sulfur dioxide	1 HOUR	SO2 1-hour 2010	Parts per billion	0.761143	2.7	2.4	2.1	1.9	0.7	0.9	1.2	1.4	1.7	2.1	14360 ARROW BLVD., FONTANA
Sulfur dioxide	3-HR BLK AVG	SO2 3-hour 1971	Parts per billion	0.431421	2.1	1.8	1.4	1.3	0.4	0.6	0.7	0.8	0.9	1	14360 ARROW BLVD., FONTANA

2023 Monitoring Data

Parameter Name	Duration Description	Pollutant Standard	Units of Measure	Arithmetic Mean	First Maximum Value	Second Maximum Value	Third Maximum Value	Fourth Maximum Value	50th Perecentile	75th Perecentile	90th Perecentile	95th Perecentile	98th Perecentile	99th Perecentile	Address
Carbon monoxide	1 HOUR	CO 1-hour 1971	Parts per million	0.199884	1.5	1.4	1.3	1.3	0.1	0.3	0.4	0.6	0.7	0.8	14360 ARROW BLVD., FONTANA
Carbon monoxide	8-HR RUN AVG E	CO 8-hour 1971	Parts per million	0.204426	1.0	1.0	1.0	0.9	0.2	0.3	0.4	0.5	0.6	0.7	14360 ARROW BLVD., FONTANA
Nitrogen dioxide (NO2)	1 HOUR	NO2 1-hour 2010	Parts per billion	30.390503	63.2	59.6	58.4	57.8	30.8	37.6	44.8	50.5	54.5	57.8	14360 ARROW BLVD., FONTANA
Nitrogen dioxide (NO2)	1 HOUR	NO2 Annual 1971	Parts per billion	16.59102	63.2	61.5	59.6	58.4	13.8	24.3	32.5	36.6	41.3	45.4	14360 ARROW BLVD., FONTANA
Ozone	1 HOUR	Ozone 1-hour 1979	Parts per million	0.062239	0.131	0.13	0.124	0.121	0.054	0.083	0.102	0.111	0.118	0.121	14360 ARROW BLVD., FONTANA
Ozone	8-HR RUN AVG E	Ozone 8-hour 2015	Parts per million	0.052491	0.111	0.107	0.106	0.105	0.047	0.068	0.083	0.091	0.099	0.105	14360 ARROW BLVD., FONTANA
PM10 Total 0-10um STP	24 HOUR	PM10 24-hour 2006	Micrograms/cubic n	33.068966	132	103	58	58	30	42	54	58	103	132	14360 ARROW BLVD., FONTANA
PM2.5 - Local Conditions	24 HOUR	PM25 24-hour 2012	Micrograms/cubic n	11.243697	101.1	27.3	25	22.7	9.7	12.8	17.2	19.8	25	27.3	14360 ARROW BLVD., FONTANA
PM2.5 - Local Conditions	24 HOUR	PM25 Annual 2012	Micrograms/cubic n	11.243697	101.1	27.3	25	22.7	9.7	12.8	17.2	19.8	25	27.3	14360 ARROW BLVD., FONTANA
Sulfur dioxide	1 HOUR	SO2 1-hour 2010	Parts per billion	0.440169	3.3	3	1.4	1.4	0.4	0.6	0.8	1	1.2	1.4	14360 ARROW BLVD., FONTANA
Sulfur dioxide	3-HR BLK AVG	SO2 3-hour 1971	Parts per billion	0.201126	2.9	1.5	1.4	1.2	0.2	0.3	0.5	0.5	0.7	0.8	14360 ARROW BLVD., FONTANA

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APPENDIX B

BIOLOGICAL RESOURCES ASSESSMENT

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BIOLOGICAL RESOURCES ASSESSMENT

SAN ANTONIO WATER COMPANY HEADQUARTERS

UPLAND, SAN BERNARDINO COUNTY, CALIFORNIA

(APN 1044-091-22)

LSA

September 2024

BIOLOGICAL RESOURCES ASSESSMENT

SAN ANTONIO WATER COMPANY HEADQUARTERS

UPLAND, SAN BERNARDINO COUNTY, CALIFORNIA

(APN 1044-091-22)

Submitted to:

Brian C. Lee, General Manager
San Antonio Water Company
139 North Euclid Avenue
Upland, California 91786

Prepared by:

LSA Associates, Inc.
1500 Iowa Avenue, Suite 200
Riverside, California 92507
(951) 781-9310

Project No. 20241723

LSA

September 2024

TABLE OF CONTENTS

TABLE OF CONTENTS i
LIST OF ABBREVIATIONS AND ACRONYMS ii
INTRODUCTION 1
Site Description 1
METHODS 2
Literature Review 2
Reconnaissance Field Survey 3
RESULTS 4
Existing Site Conditions 4
Topography and Soils 4
Vegetation and Land Cover 4
Wetlands and Other Jurisdictional Waters 5
Wildlife 6
Special-Status Species 6
IMPACT FINDINGS 22
Vegetation and Habitat Impacts 22
Threatened and Endangered Species 22
Non-Listed Special-Status Species 22
Nesting Birds 23
Wildlife Movement, Corridors, and Nursery Sites 24
Local Tree Ordinance 24
REFERENCES 25

TABLES

Table A: Mapped Soils Classification 4
Table B: Mapped Vegetation/Land Cover Classifications 5
Table C: Special-Status Species Occurrence Probability 7

APPENDICES

A: FIGURES 1–5
B: VASCULAR PLANT SPECIES OBSERVED

LIST OF ABBREVIATIONS AND ACRONYMS

APN	Assessor's Parcel Number
BRA	Biological Resources Assessment
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
City	City of Upland
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CWA	Clean Water Act
IPaC	Information for Planning and Consultation
NRCS	Natural Resources Conservation Service
Project	San Antonio Water Company Headquarters Project
RWQCB	Regional Water Quality Control Board
SAWCO	San Antonio Water Company
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

INTRODUCTION

The following Biological Resources Assessment (BRA) technical report prepared by LSA & Associates, and in accordance with the California Environmental Quality Act (CEQA), includes a description of the biological resources present or with the potential to occur within the proposed San Antonio Water Company (SAWCO) Headquarters Project (Project) and surrounding areas, and analyzes potential Project-related impacts to protected species and associated habitats.

SITE DESCRIPTION

The Project is located at 400 East 20th Street, on Assessor's Parcel Numbers (APN) 1044-091-22-0000 in Upland, San Bernardino County, California (Figure 1; all figures are provided in Appendix A). The Project would result in the construction of a new 3,698 square-foot SAWCO headquarters and associated improvements including a 4,066 square-foot maintenance building, maintenance yard, driveway, parking, solar cover, citrus grove, and ornamental landscaping on approximately 4.92 acres of SAWCO property (refer to Figure 2).

The Project site is located in northwest Upland in an area primarily consisting of residential, commercial, and industrial uses. The Project site is bound by East 20th Street to the north, undeveloped open space to the east, State Route 210 (SR-210) to the south, and Flower Court to the west.

METHODS

LITERATURE REVIEW

A literature review and record search were conducted in July 2024 to identify the existence and potential for occurrence of sensitive or special-status plant and animal species in the Project vicinity. A thorough search of the databases for published accounts of special-status plant and animal species was conducted for the *Mount Baldy* 7.5-minute quadrangle that contains the Project, and for the three surrounding quadrangles: *Cucamonga Peak, Guasti,* and *Ontario*. Federal and State lists of sensitive species were also examined. Current electronic database records reviewed included the following:

- **California Natural Diversity Database information (CNDDB – RareFind 5)** (California Department of Fish and Wildlife [CDFW] 2024), which is administered by the CDFW, formerly known as the California Department of Fish and Game. This database covers sensitive plant and animal species, as well as sensitive natural communities that occur in California.

- **California Native Plant Society's (CNPS) Electronic Inventory of Rare and Endangered Vascular Plants** (CNPS 2024), which uses four specific categories or "lists" of sensitive plant species to assist with the conservation of rare or endangered botanical resources. All of the plants constituting California Rare Plant Ranks 1A, 1B, 2A, and 2B are intended to meet the status definitions of "threatened" or "endangered" in the California Endangered Species Act (CESA) and the California Fish and Game Code and are considered by CNPS to be eligible for State listing. At the discretion of the CEQA Lead Agency, impacts to these species may be analyzed as such, pursuant to *State CEQA Guidelines* Sections 15125(c) and 15380. Plants in Rank 3 (limited information; review list), Rank 4 (limited distribution; watch list), or that are considered Locally Unusual and Significant may be analyzed under CEQA if there is sufficient information to assess potential significant impacts.

- **United States Fish and Wildlife Service's (USFWS) Information for Planning and Consultation (IPaC) Online System** (USFWS 2024a), which lists all proposed, candidate, threatened, and endangered species managed by the USFWS Endangered Species Program that have the potential to occur on or near a particular site. This database also lists all known critical habitats, national wildlife refuges, and migratory birds that could potentially be impacted by activities from a proposed project. An IPaC resource report was generated for the Project.

In addition to the databases listed above, historic and current aerial imagery, existing environmental reports for developments in the Project vicinity, and regional habitat conservation plans, and local land use policies related to biological resources were reviewed. Wetland resources including riparian corridors were determined using the USFWS Wetlands Mapper online edition (USFWS 2024d). Soil types were determined using the United States Department of Agriculture Natural Resources Conservation Service (NRCS) WebSoil Survey (NRCS 2024).

RECONNAISSANCE FIELD SURVEY

LSA Biologist Chrissy Kent conducted a general reconnaissance-level, pedestrian field survey on July 19, 2024, from 7:40 a.m. to 9:00 a.m. Weather conditions during the survey consisted of clear, sunny skies, with a temperature ranging from 76 to 81 degrees Fahrenheit and a light breeze of 2 to 5 miles per hour. All areas within the approximate 4.92-acre Project site were surveyed on foot, using binoculars to assist in identifying species present. Observations on general site conditions, vegetation, and habitat suitability for various special-status elements were recorded, and a list of observed and detected plant and animal species is provided in Appendix B.

RESULTS

EXISTING SITE CONDITIONS

The parcel is composed of existing developments including an underground one-million-gallon water storage tank located at the northwestern corner, a pump station located at the southwestern corner, and a signal building and tower located at the southeastern corner. Approximately five SAWCO employees within the Operations Department use the Project site on a daily basis for equipment and material storage. The existing water storage tank, pump station, and signal buildings and tower would remain in place.

The site is bordered by developed areas to the north, west, and south. Residential communities surround the north and west sides, while the south side features a developed roadway—Route 210, Foothill freeway. Directly adjacent to the Project site to the east is an undeveloped open space owned by Southern California Edison Company; this vacant lot connects to East 20th Street and is next to Holliday Rock, a ready-mix concrete supplier. The site itself primarily consists of nonnative, disturbed vegetation. The following sections discuss topography and soils, vegetation, and wildlife within the Project site.

Topography and Soils

The topography of the Project site is relatively level, with a slope of 3.9 percent and elevations ranging from 1,634 to 1,659 feet above mean sea level.

Three soil types were mapped on the Project site: Soboba stony loamy with 2 to 9 percent slopes, Soboba gravelly loamy sand with 0 to 9 percent slopes, and Hanford coarse sandy loam with 2 to 9 percent slopes (see Table A and Figure 3). These soils are not classified as hydric and have a drainage class of excessively drained and well drained (NRCS 2024). The existing soils across the Project site are highly compacted, which is indicative of long-term disturbance and consistent with the current site conditions.

Table A: Mapped Soils Classification

Soil	Drainage Class	Frequency of Flooding	Frequency of Ponding	Hydric Soil Rating
Soboba stony loamy, 2 to 0 percent slopes	Excessively Drained	Rare	None	No
Soboba gravelly loamy sand, 0 to 9 percent slopes	Excessively Drained	Rare	None	No
Hanford coarse sandy loam, 2 to 9 percent slopes	Well Drained	Rare	None	No

Source: United States Department of Agriculture (2024) https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx (July 2024).

Vegetation and Land Cover

The Project site is almost entirely disturbed and exhibits minimal cover by native species. However, there is a small portion of the site that is composed of native scale broom (*Lepidospartum squamatum*). Figure 4 shows a map of vegetation and land cover types existing on the Project site,

and Figure 5 provides representative photographs. The approximate acreages of each vegetation/land cover category occurring on site are shown in Table B, below.

Table B: Mapped Vegetation/Land Cover Classifications

Vegetation/Land Cover	Project Acreage
Developed	0.64
Disturbed	4.33
Scale broom scrub	0.18
Total	**5.12**

Source: Compilation from field surveys LSA conducted on July 19, 2024.

A total of nine vascular plant species were identified within the Project site during the field survey. A majority of these plant species represent non-native taxa. See Appendix B for a full list of plant species identified.

Areas mapped as disturbed land cover make up approximately 4.33 acres of the Project site and is dominated by the following nonnative plant species: erodium (*Erodium cicutarium*), flax-leaved horseweed (*Erigeron bonariensis*), and red brome (*Bromus rubens*).

Native land cover is entirely composed of scale broom scrub and approximately 0.18 acre would potentially be impacted by the Project.

Wetlands and Other Jurisdictional Waters

The United States Army Corps of Engineers (USACE), under Section 404 of the federal Clean Water Act (CWA), regulates discharges of dredged or fill material into "waters of the United States." These waters include wetlands and non-wetland bodies of water that meet specific criteria, including a connection to interstate commerce. This connection may be direct (through a tributary system linking a stream channel with traditional navigable waters used in interstate or foreign commerce) or it may be indirect (through a connection identified in USACE regulations). The USACE typically regulates as non-wetland waters of the United States any body of water displaying an "ordinary high-water mark." To be considered a "jurisdictional wetland" under Section 404, an area must possess hydrophytic vegetation, hydric soils, and wetland hydrology. The CDFW, under Sections 1600 et seq. of the California Fish and Game Code, regulates alterations to lakes, rivers, and streams. A stream is defined by the presence of a channel bed and banks and at least an occasional flow of water. The Regional Water Quality Control Board (RWQCB) is responsible for the administration of Section 401 of the CWA through water quality certification of any activity that may result in a discharge to jurisdictional waters of the United States. The RWQCB may also regulate discharges to "waters of the State," including wetlands, under the California Porter-Cologne Water Quality Control Act.

No drainage features, ponded areas, wetlands, or riparian habitat subject to jurisdiction of CDFW, USACE, and/or RWQCB were found within the Project site.

Wildlife

The disturbed vegetation occurring within the Project site is considered low-quality habitat for most native wildlife species. There are trees adjacent to the Project site and native vegetation that could contribute to nesting but would not be significantly impacted by the proposed development. A total of six wildlife species were observed in (or foraging over) the Project site during the field survey: mourning Dove (*Zenaida macroura*), lesser goldfinch (*Spinus psaltria),* northern mockingbird (*Mimus* polyglottos), Anna's hummingbird (*Calypte anna*), and western fence lizard (*Sceloporus occidentalis*). Each of these species commonly occur in and around developed areas throughout Southern California.

No federally listed, State-listed, or other special-status species or signs were observed during the field survey. The Project site lacks habitat that would attract special-status wildlife species. Based on field observations and a block security wall, there is no evidence that the site functions as a wildlife movement corridor or an important stopover point for migratory species.

Special-Status Species

No special-status plant or wildlife species were observed during the field survey, but there are three known occurrence records of special-status species within 0.5 mile of the Project. Table C, below, identifies those special-status plant and animal species with CNDDB occurrence record search, and includes detailed information about each species' habitat and distribution, as well as State and federal status designations and the probability of occurrence within the Project disturbance limits. It should be noted that the literature review and record search covered a large, geographically diverse area containing numerous habitat types not found within or around the Project.

None of the species identified in the literature review are expected to occur on the Project site due to historic and ongoing anthropogenic disturbances and the lack of suitable habitats for these species.

Table C: Special-Status Species Occurrence Probability

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Plants				
Aphyllon validum ssp. *validum* **Rock Creek broomrape**	US: – CA: –	Chaparral and pinyon and juniper woodlands, particularly in granitic soils between 1030 and 2,000 meters in elevation (3,380 to 6,560 feet). Found in Los Angeles, San Bernadino, and Ventura Counties.	Blooms May through September (Parasitic perennial herb)	**Absent**: Project site lacks suitable habitat (chaparral, pinyon, or juniper woodlands). Elevation and soil parameters for this species are not present.
Arctostaphylos glandulosa ssp. *gabierlensis* **San Gabriel manzanita**	US: – CA: –	Evergreen shrub. Rocky areas in chaparral from 595 to 1,500 meters (1,950 to 5,000 feet) elevation. Known only from Los Angeles, Santa Barbara, and San Bernardino Counties, California.	Blooms March	**Absent**: Project site lacks suitable habitat (evergreen shrubs, or rocky areas in chaparral).
Berberis nevinii **Nevin's barberry**	US: FE CA: CE	Perennial stem succulent that inhabits gravelly wash margins in alluvial scrub or coarse soils and rocky slopes in chaparral at 70 to 825 meters (220 to 2,700 feet) in elevation. Known occurrences at higher elevations are planted (not natural). Known only from Los Angeles, San Bernardino, Riverside, and San Diego counties, California.	Blooms May through June	**Absent:** Project site lacks suitable habitat (gravelly wash margins in alluvial scrub or coarse soils and rocky slopes in chaparral). Conspicuous perennial species not present.
Calochortus clavatus var. *gracilis* **Slender mariposa-lily**	US: - CA: -	Chaparral, coastal scrub, and grassland at in the Transverse Ranges at 320 to 1,000 meters (1,050 to 3,300 feet) elevation. Known only from the western transverse ranges and San Gabriel Mountains of Los Angeles and Ventura Counties, California.	Blooms March through June (November)	**Absent**: Outside known range of species and no suitable habitat (chaparral, coastal scrub, or grassland in transverse ranges) on site.
Calochortus weedii var. *intermedius* **Intermediate mariposa-lily**	US: – CA: –	Dry, open rocky slopes and rock outcrops in chaparral, coastal sage scrub, and grassland, at 105 to 855 meters (340 to 2,800 feet) elevation. Known only from Los Angeles, Orange, Riverside, and San Bernardino Counties, California. In the western Riverside County area, this species is known from the hills and valleys west of Lake Skinner and Vail Lake (*The Vascular Plants of Western Riverside County, California*. F.M. Roberts et al., 2004). Appears to intergrade with *Calochortus plummerae*, which is mostly east and north of Santa Ana Mountains.	Blooms May through July (perennial herb)	**Absent:** Project site lacks dry, open rocky slopes and rock outcrops. No observations were made of *Calochortus plummerae*, which this species likes to intergrade with. The nearest recorded observation was approximately 3.4 miles away in 2020.

Table C: Special-Status Species Occurrence Probability

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Calystegia felix **Lucky morning glory**	US: – CA: –	Annual or perennial rhizomatous herb. Wetland and marshy areas, sometimes alkaline, sometimes artificially watered, from 30 to 215 meters (100 to 700 feet) elevation. All of the known extant occurrences are associated with well-watered landscaping on recently completed industrial, commercial, and residential developments in the City of Chino within a historical area of artesian springs. Older collections are from areas that are now heavily urbanized areas (including one from South Los Angeles and another from Pico Rivera in Los Angeles County). Known to occur only in western San Bernardino County. Presumed extirpated from Riverside and Los Angeles Counties.	Blooms March through September	**Absent**: Project site is not within known elevation and lacks favorable annual or perennial rhizomatous herbs within the artificially watered area at the front entrance. No wetland and marshy areas, or alkaline soils present.
Chorizanthe parryi var. *parryi* **Parry's spineflower**	US: – CA: –	Sandy or rocky soils in chaparral, coastal scrub, oak woodlands, and grassland at 40 to 1,705 meters (100 to 5,600 feet) elevation. Known only from Los Angeles, Riverside, and San Bernardino Counties.	Blooms April through June (annual herb)	**Absent:** Project site lacks suitable habitat (sandy or rocky soils in chaparral, coastal scrub, oak woodlands, and grassland).
Cladium californicum **California saw-grass**	US: – CA: –	Marshes and seeps below 600 meters (2,000 feet) elevation. In California, known from Inyo, Riverside, Santa Barbara, San Bernardino and San Luis Obispo Counties. Believed to be extirpated from Los Angeles and perhaps San Bernardino Counties. Also occurs in Arizona, New Mexico, Nevada, Texas Utah, and Mexico.	Blooms June through September (perennial rhizomatous bulb)	**Absent:** Project site lacks suitable habitat. No marshes or seeps present.
Dodecahema leptoceras **Slender-horned spineflower**	US: FE CA: CE	In the Vail Lake area, occurs in gravel soils of Temecula arkose deposits in openings in chamise chaparral. In other areas, occurs in sandy cobbly riverbed alluvium in alluvial fan sage scrub (usually late seral stage), on floodplain terraces and benches that receive infrequent overbank deposits from generally large washes or rivers, where it is most often found in shallow silty depressions dominated by leather spineflower	Blooms April through June (annual herb)	**Absent:** Project site lacks suitable soils and is not within range of receiving infrequent overbank deposits from generally large washes or rivers. No water sources or cryptogamic soil crusts were observed.

Table C: Special-Status Species Occurrence Probability

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
		(*Lastarriaea coriacea*) and other native annual species, and is often associated with cryptogamic soil crusts composed of bryophytes, algae and/or lichens. Occurs at 200 to 760 meters (600 to 2,500 feet) elevation. Known only from Los Angeles, Riverside, and San Bernardino Counties, California.		
Dudleya multicaulis **Many-stemmed dudleya**	US: – CA: – CRPR: 1B.2	Heavy, often clay soils or around granitic outcrops in chaparral, coastal sage scrub, and grassland below 790 meters (2,600 feet) elevation. Known only from Los Angeles, Orange, Riverside, San Bernardino, and San Diego Counties.	Blooms April through July (perennial herb)	**Absent**: Project site lacks clay soils, chaparral, coastal sage scrub, and grassland habitat.
Eriogonum microthecum var. *johnstonii* **Johnston's buckwheat**	US: – CA: – CRPR: 1B.3	Upper montane and subalpine coniferous forest of the San Gabriel Mountains; 1,800 to 2,900 meters (5,900 to 9,500 feet) elevation.	Blooms June through October (perennial deciduous shrub)	**Absent:** Project site is not located within the subalpine or upper montane coniferous forest.
Horkelia cuneata var. *puberula* **Mesa horkelia**	US: – CA: – CRPR: 1B.1	Sandy or gravelly soils in chaparral, or rarely in cismontane woodland or coastal scrub at 70 to 825 meters (200 to 2,700 feet) elevation. Known only from San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Orange, and San Bernardino Counties, California. Believed extirpated from Riverside and San Diego Counties.	Blooms February through July (sometimes to September) (perennial herb)	**Absent:** Project site does not contain any sandy or gravelly soils and lacks cismontane woodland and coastal scrub.
Lilium parryi **Lemon lily**	US: – CA: – CRPR: 1B.2	Bulbiferous perennial herb of wet areas in meadows and riparian and montane coniferous forests at 1,220 to 2,790 meters (4,000 to 9,200 feet) elevation. In California, known from Los Angeles, Riverside, San Bernardino, and San Diego Counties. Also occurs in Arizona and Mexico.	Blooms July through August (perennial herb)	**Absent:** No meadows, riparian, or montane coniferous forest habitats within the Project site.
Linanthus concinnus **San Gabriel linathus**	US: – CA: – CRPR: 1B.2	Dry rocky slopes in lower and upper montane coniferous forest at 1,520 to 2,800 meters (5,000 to 9,200 feet) elevation; known only from Los Angeles and San Bernardino Counties.	Blooms April through July (annual herb)	**Absent:** No suitable habitat within the Project site (dry rocky slopes in lower and upper montane coniferous forest).

Table C: Special-Status Species Occurrence Probability

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Monardella austalis ssp. *jokerstii* **Jokerst's monardella**	US: – CA: – CRPR: 1B.1	Steep scree or talus slopes between breccia and secondary alluvial benches along drainages and washes, in lower montane coniferous forest and chaparral at 1,350 to 1,750 meters (4,430 to 5,740 feet). Known only from the San Gabriel Mountains of San Bernardino County, California.	Blooms July through September (perennial rhizomatous herb)	**Absent:** No suitable habitat within the Project site (steep scree or talus slopes between breccia and secondary alluvial benches along drainages and washes, in lower montane coniferous forest and chaparral).
Monardella breweri ssp. *glandulifera* **Brown's flat monardella**	US: – CA: – CRPR: 1B.2	Chaparral and lower montane coniferous forests, particularly in dry, grassy openings and ridgetops between elevations of 1,300 and 1,500 meters. Found in Los Angeles County.	Blooms May through August (Annual herb)	**Absent:** No suitable habitat within the Project site (chaparral and lower montane coniferous forests, particularly in dry, grassy openings and ridgetops).
Monardella macrantha ssp. hallii **Hall's monardella**	US: – CA: – CRPR: 1B.3	Dry slopes and ridges in openings in chaparral, woodland, and forest at 695 to 2,195 meters (2,280 to 7,200 feet) elevation. Known only from Los Angeles, San Diego, Orange, Riverside, and San Bernardino Counties, California. In the western Riverside County area, known only from higher elevations in the Santa Ana and Agua Tibia Mountains (*The Vascular Plants of Western Riverside County, California*. F.M. Roberts et al., 2004).	Blooms June through August (sometimes to October) (perennial herb)	**Absent:** No suitable habitat within the Project site (dry slopes and ridges in openings in chaparral, woodland, and forest).
Muhlenbergia utilis **Aparejo grass**	US: – CA: – CRPR: 2B.2	Wet sites along streams and ponds within meadows, coastal sage scrub, chaparral, and cismontane woodland below 2,325 meters (7,628 feet) elevation. In California, known from Inyo, Kern, Monterey, San Bernardino, San Luis Obispo, Santa Barbara, and Ventura Counties. Also occurs in Arizona, Nevada, New Mexico, and Mexico.	Blooms March through October (perennial herb)	**Absent:** No streams or ponds with meadows, coastal sage scrub, chaparral, and cismontane woodland are on site to provide suitable habitat.
Navarretia prostrata **Prostrate vernal pool navarretia**	US: – CA: – CRPR: 1B.2	Vernal pools, usually alkaline, from 15 to 1,210 meters (50 to 4,000 feet) elevation. Known only from Alameda, Fresno, Los Angeles, Merced, Monterey, Orange, Riverside, San Benito, San Diego, and San Luis Obispo Counties. Presumed extirpated from San Bernardino County.	Blooms April through July (annual herb)	**Absent:** No vernal pools present on Project site.

Table C: Special-Status Species Occurrence Probability

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Oreinana vestita **Woolly mountain-parsley**	US: – CA: – CRPR: 1B.3	Scree, talus, or gravel on high ridges in subalpine coniferous forest and upper montane coniferous forest at 1,615 to 3,500 meters (5,300 to 11,500 feet) elevation. Known only from Kern, Los Angeles, and San Bernardino Counties, California.	Blooms May through September (perennial herb)	**Absent:** No suitable habitat within the Project site (scree, talus, or gravel on high ridges in subalpine coniferous forest and upper montane coniferous forest).
Phacelia stellaris **Brand's star phacelia**	US: – CA: – CRPR: 1B.1	Dunes and sandy openings in coastal scrub communities at 5 to 400 meters (20 to 1,300 feet) elevation. In western Riverside County, this species appears to be restricted to sandy washes and benches in alluvial floodplains. Known only from Los Angeles (believed extirpated), Riverside and San Diego Counties, California. The most recent record of this species from Los Angeles County was in 1943.	Blooms March through June (annual herb)	**Absent:** No dunes or sandy areas on site. Project is also not within a sandy wash or bench.
Pseudognaphalium leucocephalum **White rabbit-tobacco**	US: – CA: – CRPR: 2B.2	Sand and gravel at the edges of washes or mouths of steep canyons at 0 to 2,100 meters (0 to 7,000 feet) elevation. In California, known from Los Angeles, Orange, Riverside, Santa Barbara, San Diego, San Luis Obispo, and Ventura Counties. Also occurs in Arizona, New Mexico, Texas, and Mexico.	Blooms usually August through November (perennial herb)	**Absent:** Site is not within the edge of a wash or mouth of a steep canyon. No sandy or gravelly soils present.
Sagittaria sanfordii **Sanford's arrowhead**	US: – CA: – CRPR: 1B.2	Marshes and swamps below 650 meters (2,100 feet) elevation. Occurs in standing or slow-moving fresh water (ponds, marshes, and ditches). Known only from Butte, Del Norte, El Dorado, Fresno, Merced, Mariposa, Placer, Sacramento, Shasta, San Joaquin, and Tehama Counties. Believed extirpated from Southern California.	Blooms May through October (perennial emergent herb)	**Absent:** No marshes or swamps occur at this Project site.
Sidalcea neomexicana **Salt Spring checkerbloom**	US: – CA: – CRPR: 2B.2	Alkaline springs and brackish marshes below 1,530 meters (5,000 feet) elevation. In California, known only from Kern, Orange, Riverside, San Bernardino, San Diego, and Ventura Counties. Believed extirpated from Los Angeles County. Also known from Arizona, New Mexico, Nevada, Utah, and Mexico.	Blooms March through June (perennial herb)	**Absent:** No alkaline or brackish habitats present on Project site.

Table C: Special-Status Species Occurrence Probability

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Symphyotrichum defoliatum **San Bernardino aster**	US: – CA: – CRPR: 1B.2	Vernally wet sites (such as ditches, streams, and springs) in many plant communities below 2,040 meters (6,700 feet) elevation. In California, known from Ventura, Kern, San Bernardino, Los Angeles, Orange, Riverside, and San Diego Counties. May also occur in San Luis Obispo County. In the western Riverside County area, this species is scarce, and documented only from Temescal and San Timoteo Canyons (*The Vascular Plants of Western Riverside County, California*. F.M. Roberts et al., 2004).	Blooms July through November (perennial herb)	**Absent:** No vernally wet areas are present on Project site.
Symphyotrichum greatae **Greata's aster**	US: – CA: – CRPR: 1B.3	Mesic places in canyons in chaparral and woodland habitats at 300 to 2,010 meters (1,000 to 6,600 feet) elevation. Known only from Los Angeles, San Bernardino, and Ventura Counties.	Blooms June through October (perennial herb)	**Absent:** No chaparral or woodland habitat present on Project site.
Thysanocarpus rigidus **Rigid fringepod**	US: – CA: – CRPR: 1B.2	Dry rocky slopes, in oak, pine, or juniper woodland at 600 to 2,200 meters (2,000 to 7,200 feet) elevation. In California, known from Los Angeles, Riverside, San Bernardino, and San Diego Counties. Also occurs in Mexico.	Blooms February through May (annual herb)	**Absent:** No suitable habitat within the Project site (dry rocky slopes, in oak, pine, or juniper woodland).
Viola pinetorum ssp. *grisea* **Grey-leaved violet**	US: – CA: – CRPR: 1B.2	Dry mountain peaks and slopes in meadows and upper montane and subalpine coniferous forest at 1,500 to 3,400 meters (5,000 to 11,000 feet) elevation. Known only from Fresno, Inyo, Kern, Los Angeles, Madera, San Bernardino, Tulare, and Ventura Counties, California.	Blooms April through July (perennial herb)	**Absent:** No suitable habitat within the Project site (dry mountain peaks and slopes in meadows and upper montane and subalpine coniferous forest).
Invertebrates				
Bombus crotchii **Crotch bumble bee**	US: – CA: SCE	Inhabits open scrub (including chaparral) and grassland from coastal California to crest of Sierra-Cascade and in desert edge areas, south into Mexico. Primarily nests underground. Suitable bumble bee habitat requires the continuous availability of flowers on which to forage throughout the duration of the colony (spring through fall), colony nest sites, and overwintering sites for the queens.	Spring and summer	**Absent:** Project site lacks scrub habitat. Site consists of minimal, non-native grassland that is often disturbed resulting in the destruction or removal of vegetation as seen in ariels throughout the years. Therefore, no suitable flower availability is present to support a colony.

Table C: Special-Status Species Occurrence Probability

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Bombus pensylvanicus **American bumble bee**	US: – CA: –	Inhabits open farmland and fields throughout the U.S. Also occurs in Canada and Mexico. Primarily nests at the ground surface in tall grass, but occasionally underground. Suitable bumble bee habitat requires the continuous availability of flowers on which to forage throughout the duration of the colony (spring through fall), colony nest sites, and overwintering sites for the queens.	Spring and Summer	**Absent:** Project site is not composed of open farmland or fields and lacks flower availability to support a colony. Site is often disturbed which does not allow the growth of tall grass that is needed for nesting.
Callophrys mossii hidakupa **San Gabriel Mountains elfin butterfly**	US: – CA: –	Inhabit rocky outcrops, woody canyons and cliffs. Larvae host plants for this species include *Dudleya* sp.	April through June	**Absent:** Project site lacks suitable habitat (rocky outcrops, woody canyons or cliffs). Larvae host plant *Dudleya* sp. not observed on site.
Gonidea angulata **Western ridges mussel**	US: – CA: –	Commonly found in stream and lakes. Prefer a constant waterflow and well-oxygenates stable substrates. Not commonly found in continuously turbid waters.	Spring and Summer	**Absent:** No water features are within the Project site.
Neolarra alba **White cuckoo bee**	US: – CA: –	Kleptoparasite that occurs in Southern California.	N/A	**Low:** Little is known about the habitat needs of this species. The Project site is within the range for this species. However, due to lack of vegetation on this site, the species is not expected to be present. There are no known records of occurrence within 5 miles of the Project.
Rhaphiomidas terminatus abdominalis **Delhi Sands flower-loving fly**	US: FE CA: SA	Restricted to Delhi series sands in western Riverside and San Bernardino Counties.	Above ground emergence August and September. Not visible during the rest of the year.	**Absent:** No Delhi series sands on Project site.

Table C: Special-Status Species Occurrence Probability

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Fish				
Catostomus santaanae **Santa Ana sucker**	US: FT CA: SSC	The Santa Ana sucker's historical range includes the Los Angeles, San Gabriel, and Santa Ana River drainage systems located in Southern California. An introduced population also occurs in the Santa Clara River drainage system in southern California. Found in shallow, cool, running water.	Year-round	**Absent:** Project site does not contain any water features.
Gila orcutti **Arroyo chub**	US: – CA: SSC	Perennial streams or intermittent streams with permanent pools; slow water sections of streams with mud or sand substrates; spawning occurs in pools. Native to Los Angeles, San Gabriel, San Luis Rey, Santa Ana, and Santa Margarita River systems; introduced in Santa Ynez, Santa Maria, Cuyama, and Mojave River systems and smaller coastal streams.	Year-round	**Absent:** Project site does not contain any water features.
Amphibians				
Anaxyrus (Bufo) californicus **Arroyo toad**	US: FE CA: SSC	Washes and arroyos with open water; sand or gravel beds; for breeding, pools with sparse overstory vegetation. Coastal and a few desert streams from Santa Barbara County to Baja California.	March through July	**Absent:** Project site lacks suitable habitat (washes or arroyos with open water; sand or gravel beds). Site does not contain any open water or water sources.
Batrachoseps gabrieli **San Gabreil slender salamander**	US: – CA: –	Found under rocks, wood, fern fronds and on soil at the base of talus slopes. This salamander is most active on the surface in winter and early spring. Known only from the San Gabriel Mountains.	Winter through early spring	**Absent:** Project site lacks suitable habitat (rocks, wood, fern fronds, or soil at the base of talus slopes).
Rana boylii **Foothill yellow-legged frog**	US: FE/FT CA: SE/ST/SSC	Partly-shaded, shallow streams and riffles with a rocky (at least some cobble-sized) substrate for egg-laying, and with water for at least 15 weeks until metamorphosis. Historically occurred in much of northern and central California, south along the western foothills of the Sierra Nevada to the edge of the Tehachapi Mountains, and south along the coast ranges to the San Gabriel Mountains (south to the San Gabriel River) in Los Angeles County.	Unknown	**Absent:** No suitable habitat is present on Project site. Outside the known range of this species and the site does not contain any water features.

Table C: Special-Status Species Occurrence Probability

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Rana mucosa **Southern mountain yellow-legged frog**	US: FE CA: CE	Ponds, lakes, and streams at moderate to high elevation; appears to prefer bodies of water with open margins and gently sloping bottom. Transverse Ranges in southern California from 370 to 2,290 meters (1,200 to 7,500 feet) elevation. Restricted to streams in ponderosa pine, montane hardwood-conifer, and montane riparian habitats.	March through June	**Absent:** No water features within the Project site.
Spea hammondii **Western spadefoot**	US: PT CA: SSC	Grasslands and occasionally hardwood woodlands; largely terrestrial but requires rain pools or other ponded water persisting at least three weeks for breeding; burrows in loose soils during dry season. Occurs in the Central Valley and adjacent foothills, the non-desert areas of southern California, and Baja California.	October through April (following onset of winter rains)	**Absent:** Site is highly disturbed and within a developed area. No vernal pools occur on site for breeding and soils are too compacted for burrowing.
Taricha torosa **Coast Range newt**	US: – CA: SSC	Breeds in ponds, reservoirs, and slow-moving streams with long-lasting (at least through July), clean water; uses nearby upland areas including grassland, chaparral, and woodland; coastal drainages from Mendocino County south to San Diego County, with populations from San Luis Obispo County south designated as sensitive.	October through May	**Absent:** Project site does not contain water features and lacks grassland, chaparral, or woodland habitat. No coastal drainages are present.
Reptiles				
Anniella stebbinsi **Southern California legless lizard**	US: – CA: SSC	Inhabits sandy or loose loamy soils with high moisture content under sparse vegetation in Southern California.	Nearly year round, at least in southern areas	**Absent:** Project site is highly disturbed and contains inadequate soils.
Arizona elegans occidentalis **California glossy snake**	US: – CA: SSC	Scrub and grassland habitats, often with loose or sandy soils. Patchily distributed from the eastern portion of San Francisco Bay to southern San Joaquin Valley and in non-desert areas of southern California. Also occurs in Baja California, Mexico.	Most active March through June (nocturnal)	**Absent:** Although ruderal/non-native grasslands are present, site soil textures do not meet the requirements needed to support suitable habitat and Project site is highly disturbed.

Table C: Special-Status Species Occurrence Probability

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Aspidoscelis tigris stejnegeri **Coastal whiptail**	US: – CA: SSC	Woodlands, riparian areas, and sparsely vegetated areas in a wide variety of habitats including coastal sage scrub and sparse grassland. Occurs in valleys and foothills from Ventura County to Baja California.	April through August	**Absent**: Although ruderal/non-native grasslands are present, site soil textures do not meet the requirements needed to support suitable habitat.
Phrynosoma blainvillii (coronatum) **Coast horned lizard**	US: – CA: SSC	Primarily in sandy soil in open areas, especially washes and floodplains, in many plant communities. Requires open areas for sunning, bushes for cover, patches of loose soil for burial, and an abundant supply of ants or other insects. Occurs west of the deserts from northern Baja California north to Shasta County below 2,400 meters (8,000 feet) elevation.	April through July with reduced activity August through October	**Absent:** Project site lacks sandy soils for burrowing and scrub needed for cover. Sparse vegetation on site is not expected to contribute to the abundance of insects or ants being present.
Thamnophis hammondii **Two-striped garter snake**	US: – CA: SSC	Highly aquatic. Only in or near permanent sources of water. Streams with rocky beds supporting willows or other riparian vegetation. From Monterey County to northwest Baja California.	Diurnal Year-round	**Absent:** No permanent water sources occur on the Project site.
Birds				
Agelaius tricolor (nesting colony) **Tricolored blackbird**	US: – CA: ST/SSC	Open country. Forages in grassland and cropland habitats. Nests in large groups near fresh water, preferably in emergent wetland with tall, dense cattails or tules, but also in thickets of willow, blackberry, wild rose, or tall herbs. Seeks cover for roosting in emergent wetland vegetation, especially cattails and tules, and also in trees and shrubs. Occurs in western Oregon, California, and northwestern Baja California.	Year-round	**Absent:** Project site lacks suitable habitat. No grassland or cropland is present, and site lacks emergent wetlands needed for nesting.
Aimophila ruficeps canescens **Southern California rufous-crowned sparrow**	US: – CA: WL	Coast lowlands and foothills in sage scrub, broken or burned chaparral, and grassland with scattered shrubs. Prefers open scrubby habitat on rocky xeric slopes.	Year-Round, diurnal active	**Absent:** Project site lacks suitable habitat. No scrubby habitat on rocky xeric slopes occur on site.

Table C: Special-Status Species Occurrence Probability

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Athene cunicularia (burrow sites) **Burrowing owl**	US: – CA: SSC	Open, treeless areas with low, sparse vegetation, usually on flat or gently sloping terrain, including grasslands, sparse scrub (cover less than 30 percent), farmland, airfields, airports, road embankments, cemeteries, urban vacant lots, desert areas, and other open habitat. They usually occupy ground squirrel burrows but may also utilize man-made structures such as culverts or debris piles, usually temporarily.	Year-round	**Low to Moderate:** Habitat on site has the potential to be suitable. However, species has not been seen within 10 miles of the Project site according to ebird records (2024). Site is also highly disturbed and no efficient size burrows were observed during the July field survey.
Beuto swansoni **Swainson's hawk**	US: – CA: CT	Open desert, grassland, or cropland containing scattered, large trees or small groves. Breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah in the Central Valley. Forages in adjacent grasslands or suitable grain or alfalfa fields, or livestock pastures. Breeds and nests in western North America; winters in South America. Uncommon breeding resident and migrant in the Central Valley, Klamath Basin, Northeastern Plateau, Lassen County, and Mojave Desert. Very limited breeding reported from Lanfair Valley, Owens Valley, Fish Lake Valley, and Antelope Valley. In Southern California, now mostly limited to spring and fall transient. Formerly abundant in California with wider breeding range.	Spring and Fall	**Absent:** Project site lacks suitable (open desert, grassland, or cropland containing scattered, large trees or small groves) habitat. Site also lacks trees in juniper-sage flats, riparian areas, or oak savannah necessary for breeding.
Cypseloides niger **Black swift**	US: – CA: SSC	Most frequently seen in the air feeding on tiny airborne insects. Usually seen near cliffs in mountainous regions; occasionally coastal. Nests in crevices in deep canyon cliffs near waterfalls or in sea cliffs. In California, breeds very locally in the Sierra Nevada and Cascade Range, the San Gabriel, San Bernardino, and San Jacinto Mountains, and in coastal bluffs and mountains from San Mateo County south to probably San Luis Obispo County.	Spring through Summer	**Absent:** Project site lacks suitable habitat (cliffs in mountainous regions or coastal terrain) for nesting and foraging.

Table C: Special-Status Species Occurrence Probability

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Laterallus jamaicensis coturniculus **California black rail**	US: – CA: ST/CFP	Requires shallow water in salt marshes, freshwater marshes, wet meadows, or flooded grassy vegetation. Prefers areas of moist soil vegetated by fine-stemmed emergent plants, rushes, grasses, or sedges, with scattered small pools. Known from coastal California, northwestern Baja California, the lower Imperial Valley, and the lower Colorado River of Arizona and California. Now extirpated from virtually all of coastal Southern California.	Year-round	**Absent:** No water sources, fresh or saltwater marshes, wet meadows, or flooded grassy vegetation present on Project site.
Polioptila californica californica **Coastal California gnatcatcher**	US: FT CA: SSC	Inhabits coastal sage scrub in low-lying foothills and valleys up to about 500 meters (1,640 feet) elevation in cismontane southwestern California and Baja California.	Year-round	**Absent:** Project site lacks suitable habitat. No coastal sage scrub in low-lying foothills or valleys are present.
Mammals				
Antrozous pallidus **Pallid bat**	US: – CA: SSC	Most common in open, dry habitats with rocky areas for roosting. Day roosts in caves, crevices, rocky outcrops, tree hollows or crevices, mines and occasionally buildings, culverts, and bridges. Night roosts may be more open sites, such as porches and open buildings. Grasslands, shrublands, woodlands, and forest in western North America.	Year-round; nocturnal	**Low:** Site does not contain preferred habitat for general roosting. However, adjacent more developed lands or trees may provide space for night roosting allowing them to present within the Project site for foraging.
Chaetodipus fallax fallax **Northwestern San Diego pocket mouse**	US: – CA: SSC	Found in sandy herbaceous areas, usually associated with rocks or coarse gravel in coastal scrub, chaparral, grasslands, and sagebrush, from Los Angeles County through southwestern San Bernardino, western Riverside, and San Diego Counties to northern Baja California.	Year-round	**Low:** Project lacks sandy herbaceous areas. Site is highly disturbed in which vegetation varies due to the destruction or disturbance of it.
Dipodomys merriami parvus **San Bernardino kangaroo rat**	US: FE CA: SE/SSC	Gravelly and sandy soils of alluvial fans, braided river channels, active channels and terraces; San Bernardino Valley (San Bernardino County) and San Jacinto Valley (Riverside County). In San Bernardino County, this species occurs primarily in the Santa Ana River and its tributaries north of	Nocturnal, active year-round	**Low:** Project site lacks preferred habitat. No gravelly or sandy soils of alluvial fans, braided river channels, active channels or terraces. Site is highly disturbed in which vegetation varies due to the

Table C: Special-Status Species Occurrence Probability

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
		Interstate 10, with small remnant populations in the Etiwanda alluvial fan, the northern portion of the Jurupa Mountains in the south Bloomington area, and in Reche Canyon. In Riverside County, this species occurs along the San Jacinto River east of approximately Sanderson Avenue, and along Bautista Creek. Remnant populations may also occur within Riverside County in Reche Canyon, San Timoteo Canyon, Laborde Canyon, the Jurupa Mountains, and the Santa Ana River Wash north of State Route 60.		destruction or disturbance of it as seen in ariels and during the field survey.
Dipodomys stephensi **Stephen's kangaroo rat**	US: FT CA: ST	Found in plant communities transitional between grassland and coastal sage scrub, with perennial vegetation cover of less than 50 percent. Most commonly associated with *Artemisia tridentata, Eriogonum fasciculatum*, and *Erodium*. Requires well-drained soils with compaction characteristics suitable for burrow construction (neither sandy nor too hard). Not found in soils that are highly rocky or sandy, less than 20 inches deep, or heavily alkaline or clay, or in areas exceeding 25 percent slope. Occurs only in western Riverside County, northern San Diego County, and extreme southern San Bernardino County, below 915 meters (3,000 feet) elevation. In northwestern Riverside County, known only from east of Interstate 15. Reaches its northwest limit in south Norco, southeast Riverside, and in the Reche Canyon area of Riverside and extreme southern San Bernardino Counties.	Year-round, nocturnal	**Absent:** Project site lacks suitable habitat No grassland or coastal sage scrub communities onsite. Site is also not within the known range of this species.
Eumops perotis californicus **Western mastiff bat**	US: – CA: SSC	Occurs in many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, chaparral, etc.; roosts in crevices in vertical cliff faces, high buildings, and tunnels, and in palm fronds; travels widely when foraging.	Year-round; nocturnal	**Low:** Project site lacks favorable roosting habitat, but species may forage over the site.

Table C: Special-Status Species Occurrence Probability

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Lasiurus cinereus **Hoary bat**	US: CA: SA	Forages over a wide range of habitats, but prefers open habitats with access to trees for roosting, and water. Ranges throughout most of California.	Primarily the warmer months; leaves colder areas during winter	**Low:** Project site contains open habitat and trees. However, very few trees are present and only make up a small portion of the Project site. The site itself lacks favorable habitat and sources of water, but species may forage over the site.
Lasiurus xanthinus **Western yellow bat**	US: – CA: SSC	Found mostly in desert and desert riparian areas of the southwest US, but also expanding its range with the increased usage of native and non-native ornamental palms in landscaping. Individuals typically roost amid dead fronds of palms, but have also been documented roosting in cottonwood trees. Forage over many habitats.	Year-round; nocturnal	**Absent:** Project site is not within a desert or desert riparian area.
Lepus californicus bennettii **San Diego black-tailed jackrabbit**	US: – CA: SA	Variety of habitats including herbaceous and desert scrub areas, early stages of open forest and chaparral. Most common in relatively open habitats. Restricted to the cismontane areas of Southern California, extending from the coast to the Santa Monica, San Gabriel, San Bernardino, and Santa Rosa Mountain ranges.	Year-round, diurnal and crepuscular activity	**Low:** Project site is within a heavily developed area. Site is highly disturbed in which vegetation varies due to the soil compaction and disturbance.
Neotoma lepida intermedia **San Diego desert woodrat**	US: – CA: SSC	Found in desert scrub and coastal sage scrub habitat, especially in association with cactus patches. Builds stick nests around cacti, or on rocky crevices. Occurs along the Pacific slope from San Luis Obispo County to northwest Baja California.	Year-round, mainly nocturnal, occasionally crepuscular and diurnal	**Absent:** Project site lacks desert or coastal scrub habitat and lacks cacti and rocky crevices for nesting.
Nyctinomops macrotis **Big free-tailed bat**	US: – CA: SSC	Inhabits rugged, rocky canyon country in southwestern United States. Found from northern South America and the Caribbean Islands northward to the western United States. In the southwestern U.S., populations appear to be scattered.	Year-round	**Absent:** Project site lacks suitable habitat. No rugged, rocky canyon country present on site.

Table C: Special-Status Species Occurrence Probability

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Ovis canadensis nelson **Desert bighorn sheep**	US: – CA: FP	Occurs in open, rocky, steep areas with available water and herbaceous forage; widely distributed from the White Mountains in Mono County to the Chocolate Mountains in Imperial County.	Year-round	**Absent:** Project site lacks open, rocky, steep areas with available water and herbaceous forage.
Perognathus longimembris brevinasus **Los Angeles pocket mouse**	US: – CA: SSC	Prefers sandy soil for burrowing, but has been found on gravel washes and stony soils. Found in coastal sage scrub in Los Angeles, Riverside, and San Bernardino Counties.	Nocturnal. Active late spring to early fall.	**Absent:** Site lacks appropriate soils for burrowing and coastal sage scrub.

Source: Compiled by LSA (2024).

US: Federal Classifications

FE Listed as Endangered.
FT Listed as Threatened.
FPE Proposed for listing as Endangered.
FPT Proposed for listing as Threatened.
FPD Proposed for delisting.
FC Candidate for listing as Threatened or Endangered.

CA: State Classifications

SE State-listed as Endangered.
ST State-listed as Threatened.
SR State-listed as Rare.
SCE Candidate for State-listing as Endangered.
SCT Candidate for State-listing as Threatened.
SC Candidate for State-listing as Threatened or Endangered.
SSC Species of Special Concern. Refers to animals with vulnerable or seriously declining populations.
CFP California Fully Protected. Refers to animals protected from take under Fish and Game Code sections 3511, 4700, 5050, and 5515.
SA Special Animal. Refers to any other animal monitored by the Natural Diversity Data Base, regardless of its legal or rarity status.
1A California Rare Plant Rank 1A – presumed extinct in California.
1B California Rare Plant Rank 1B – rare, threatened or endangered in California and elsewhere.
2B California Rare Plant Rank 2B – rare, threatened or endangered in California, but more common elsewhere.
3 California Rare Plant Rank 3 – a review list of plants about which more information is needed.
4 California Rare Plant Rank 4 – a watch list of plants of limited distribution.

MSHCP: Western Riverside County MSHCP Status

C Species is covered and adequately conserved under the MSHCP.
S Species is covered and adequately conserved under the MSHCP, but surveys are required within indicated habitats and/or survey areas.
P Species is covered and will be adequately conserved when MSHCP specified requirements are met.

CNDDB = California Natural Diversity Database

IMPACT FINDINGS

VEGETATION AND HABITAT IMPACTS

Based on the current conditions of the Project site, construction activities would result in less than significant impacts to native habitat and would not result in any direct impacts to sensitive natural communities. According to CNDDB, there are no recorded observations of natural communities of special concern with potential to occur within the Project site or vicinity. Additionally, no natural communities of special concern were observed during the biological survey.

THREATENED AND ENDANGERED SPECIES

Under provisions of Section 7(a)(2) of the federal Endangered Species Act, a federal agency that permits, licenses, funds, or otherwise authorizes a project activity must consult with the USFWS to ensure that its actions would not jeopardize the continued existence of any listed threatened or endangered species or destroy or adversely modify critical habitat. The USFWS designates as threatened or endangered species that are at risk of extinction and may also adopt recovery plans that identify specific areas that are essential to the conservation of a listed species. Critical habitat areas that may require special management considerations or protections can also be designated.

CESA is administered by the CDFW and prohibits the "take" of plant and animal species identified as either threatened or endangered in the State of California by the Fish and Game Commission (Fish and Game Code Sections 2050 to 2097). "Take" is defined as to hunt, pursue, catch, capture, or kill. Sections 2091 and 2081 of CESA allow the CDFW to authorize exceptions to the prohibition of "take" of State-listed threatened or endangered plant and animal species for purposes such as public and private development. The CDFW requires formal consultation to ensure that a proposed project's actions would not jeopardize the continued existence of any listed species or destroy or adversely affect listed species' habitats.

As described in Table C, no regionally occurring special-status animal species are expected to be present on the Project site or to be adversely affected by the Project due to the lack of suitable habitats and the developed/disturbed conditions within the direct disturbance limits of the Project.

Additionally, as described in Table C, no federal or State-listed endangered plant species are expected to occur on the Project site due to the lack of suitable soils. Therefore, the Project would have no effects on federally listed endangered plant species.

No USFWS designated critical habitat is present on the Project site. Therefore, the Project would have no effects on designated critical habitat.

NON-LISTED SPECIAL-STATUS SPECIES

The following non-listed special-status species as identified in Table C are not expected to occur on the Project site due to a lack of suitable habitat: Southern California legless lizard (*Anniella stebbinsi*), pallid bat (*Antrozous pallidus*), California glossy snake (*Arizona elegans occidentalis*), burrowing owl (*Athene cunicularia*), western yellow bat (*Lasiurus xanthinus*), San Diego desert

woodrat (*Neotoma lepida intermedia*), big free-tailed bat (*Nyctinomops macrotis*), and coast horned lizard (*Phrynosoma blainvillii*). These species all have a limited population distribution in Southern California. These animals have no official State or federal protection status but require consideration under CEQA.

Burrowing owls, however, have a low to moderate probability of occurrence within the Project site. Burrowing owls inhabit open country across much of North America, typically occupying ground squirrel burrows in open, dry grasslands, agricultural and range lands, and other developed/ ornamental areas. They often utilize man-made structures and avoid tall, thick vegetation and brush. While the Project site does have disturbed soils and minimal vegetation cover conducive to burrowing owl usage, no burrows or signs of burrowing owls were observed during the field survey. Given the probability of occurrence is "Low to Moderate," LSA recommends the following impact avoidance measure:

- **Preconstruction Presence/Absence Survey:** 14 days prior to the commencement of proposed project activities, a qualified biologist will conduct a Presence/Absence survey of suitable habitat on the project site as well as survey for signs of scat/ burrow usage. If burrowing owls/ active burrows are directly observed within the Project site during the preconstruction survey, a suitable buffer will be placed around the active burrow as determined by a qualified biologist and avoided until the individuals leave of their own accord. Additionally, if burrowing owl is found during the preconstruction survey, the Project proponent will need to inform the CDFW and USFWS and prepare a Burrowing Owl Protection and Relocation Plan for approval by these agencies prior to initiating ground disturbance.

NESTING BIRDS

There are trees adjacent to or within the Project site and construction activities could result in impacts to nesting bird species. To reduce the potential impact, construction activities should try and avoid the nesting bird season (February 1 through September 15) or perform a preconstruction nesting bird survey prior to any Project activities planned during the nesting bird season to ensure compliance with the federal Migratory Bird Treaty Act and California Fish and Game Code Sections 3500–3516. Implementation of the following measures will reduce potential impacts to nesting raptors, migratory birds, and special status birds to a less than significant level under CEQA and will ensure compliance with State and federal laws protecting these avian species.

- **Construction Activity:** The Project's construction activities will occur, if feasible, between September 16 and January 31 (outside of nesting bird season) in an effort to avoid impacts to nesting birds. If activities must occur within nesting bird season (February 1 to September 15), a qualified biologist will conduct a pre-construction survey no more than 3 days (72 hours) prior to any construction activities and vegetation removal. Should nesting birds be found, an exclusionary buffer will be established by the qualified biologist. The buffer will be clearly marked in the field by construction personnel under guidance of the qualified biologist. No construction activities will be allowed within this zone until the qualified biologist determines that the young have fledged, or the nest is no longer active.

- **Tree Trimming and Removal:** To the greatest extent feasible, tree trimming/removal activities will be performed outside of the nesting season for birds (February 1–September 15). If trimming or removal of trees during the nesting bird season cannot be avoided, a qualified biologist will monitor tree trimming and removal activities, if nest are found present during the pre-construction survey.

WILDLIFE MOVEMENT, CORRIDORS, AND NURSERY SITES

Wildlife movement includes seasonal migration along corridors as well as daily movements for foraging. Migration corridors may include areas of unobstructed movement of deer, riparian corridors providing cover for migrating birds, routes between breeding waters and upland habitat for amphibians, and areas between roosting and feeding areas for birds.

Wildlife species that occur in the Project vicinity are adapted to the urban-wildland interface and the study area is primarily developed as existing roadway infrastructure and residential development that already restrict wildlife movement. Although there is an undeveloped lot adjacent to the eastern boundary of the Project site, areas south, west, and north are fully developed and provide little to no value to wildlife movement. Because the Project site is surrounded by development and a brick wall, the Project's activities would not place any permanent barriers within any known wildlife movement corridors or interfere with habitat connectivity and therefore would not substantially limit wildlife movement more than current wildlife movement limitations. The Project site does not correspond to any landscape blocks or essential connectivity areas, as documented in the California Essential Habitat Connectivity Project report (Beier et al. 2011).

LOCAL TREE ORDINANCE

Removal of any City tree by anyone other than the City of Upland must comply by the City of Upland's local tree ordinance (12.24.100) (City of Upland Code of Ordinances 2024). Trees were observed within or adjacent to the Project site. However, the Project does not intend to disturb or remove them. Should any potential disturbance or removal of these trees become necessary, the regulations outlined in the City of Upland's Tree Ordinance would need to be followed.

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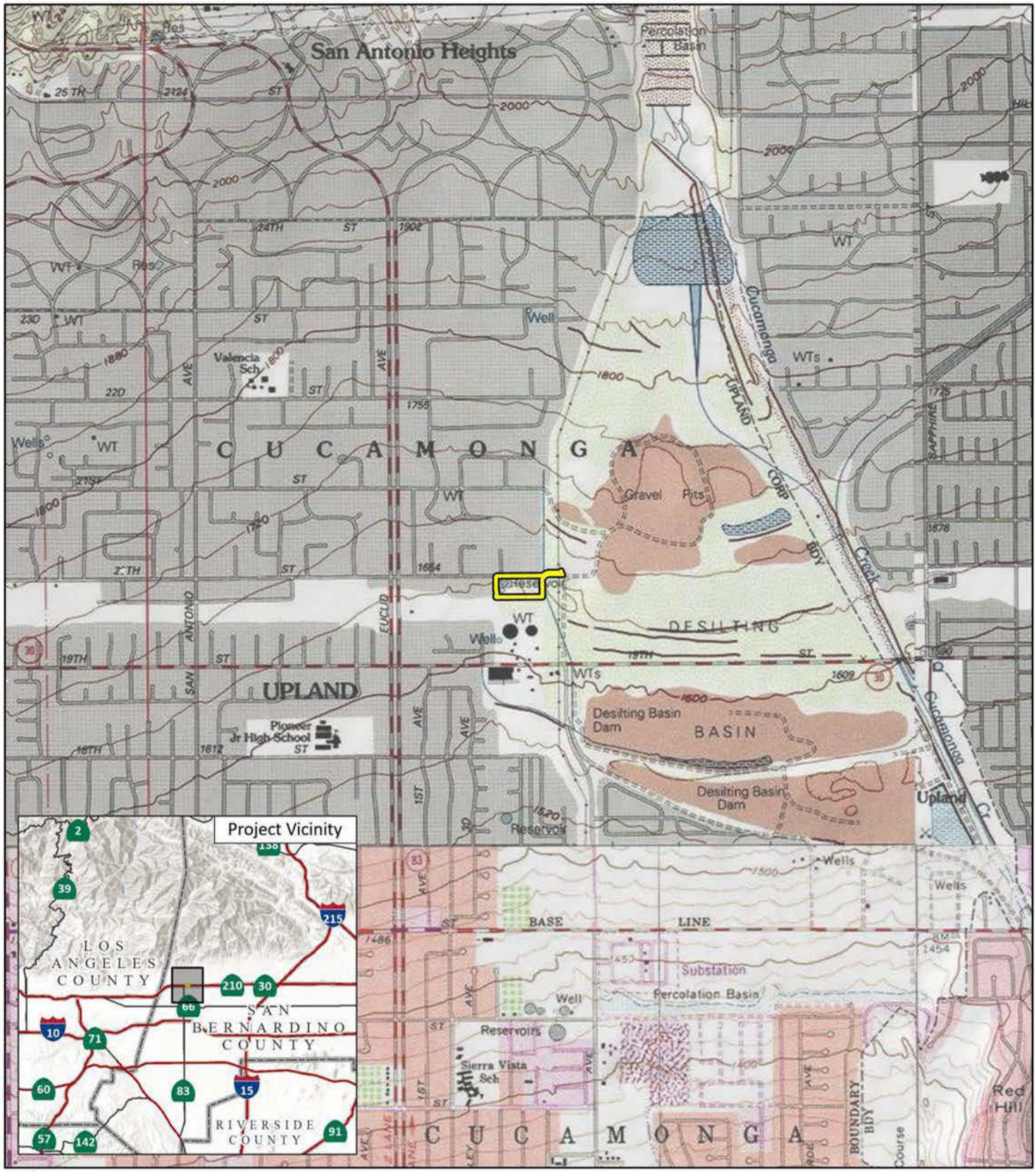
APPENDIX A

FIGURES 1–5

Figure 1: Project Location and Vicinity
Figure 2: Conceptual Site Plan
Figure 3: Soils
Figure 4: Vegetation, Land Cover, and Photo Points
Figure 5: Representative Site Photographs



LSA

FIGURE 1

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FEET

San Antonio Water Company Headquarters

Project Location and Vicinity

SOURCE: *Mt. Baldy CA*, 7.5' Quad (USGS 1988)

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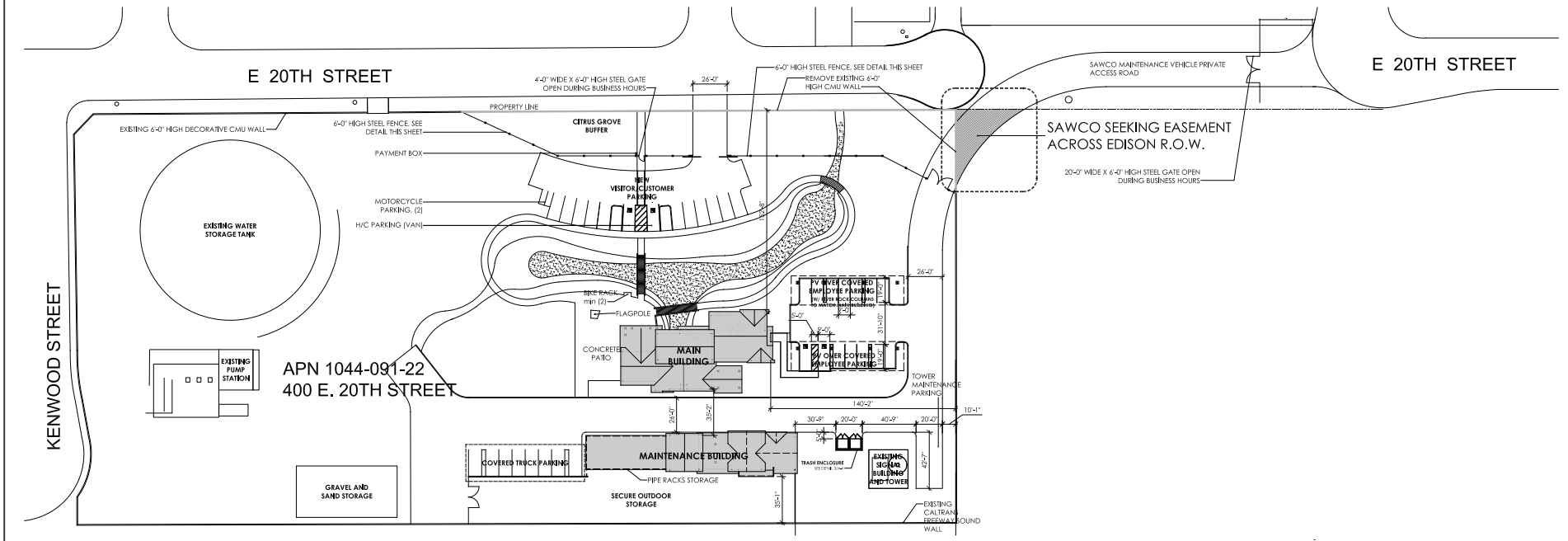

LSA

FIGURE 2

N

0 60 120

FEET

SOURCE: CEDG, Inc.

San Antonio Water Company Headquarters

Conceptual Site Plan

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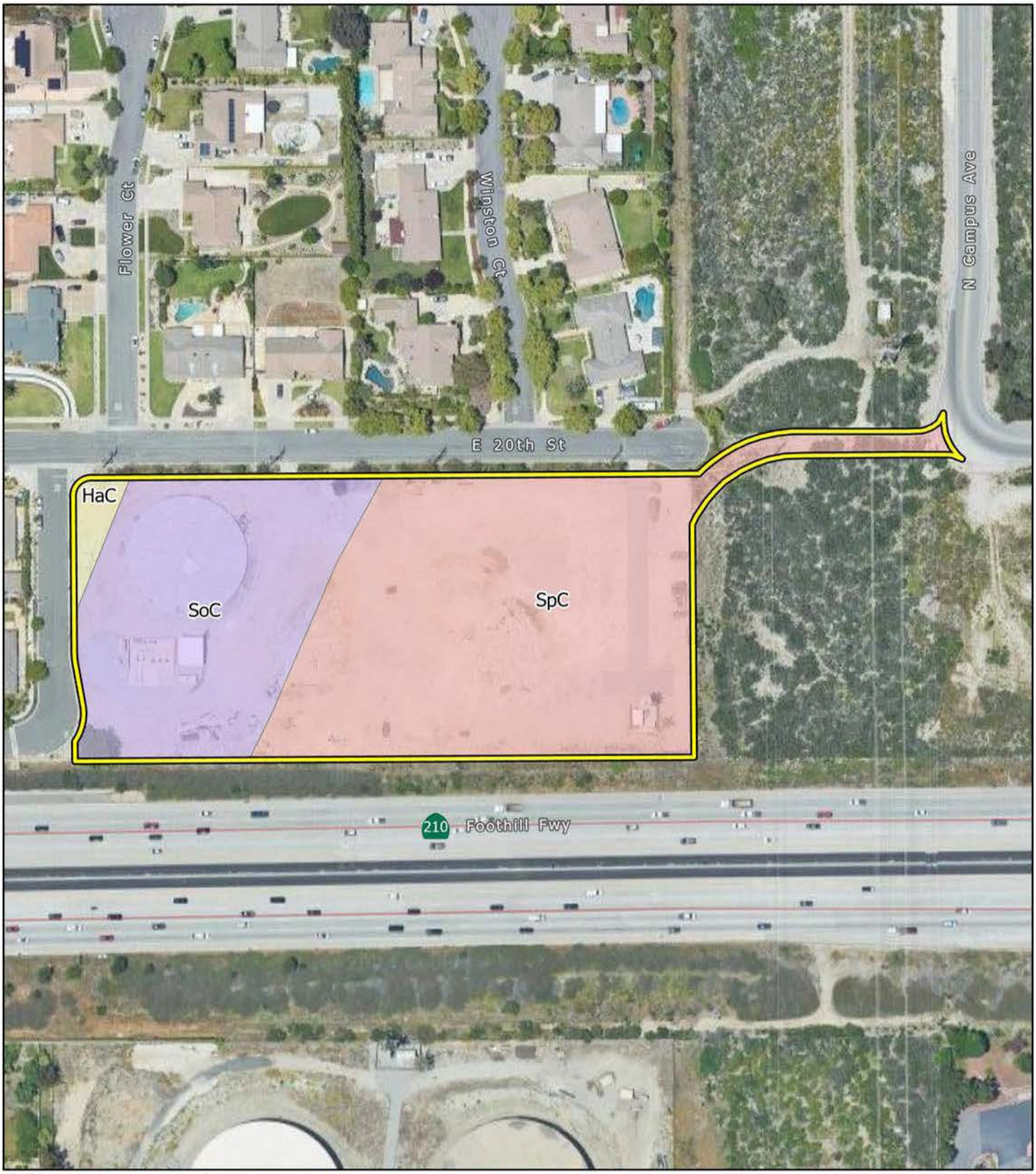

LSA

Project Location

Soils

HaC - Hanford coarse sandy loam, 2 to 9 percent slopes

SoC - Soboba gravelly loamy sand, 0 to 9 percent slopes

SpC - Soboba stony loamy sand, 2 to 9 percent slopes

0 75 150
FEET

FIGURE 3

San Antonio Water Company Headquarters

Soils

SOURCE: Google Maps (2023)

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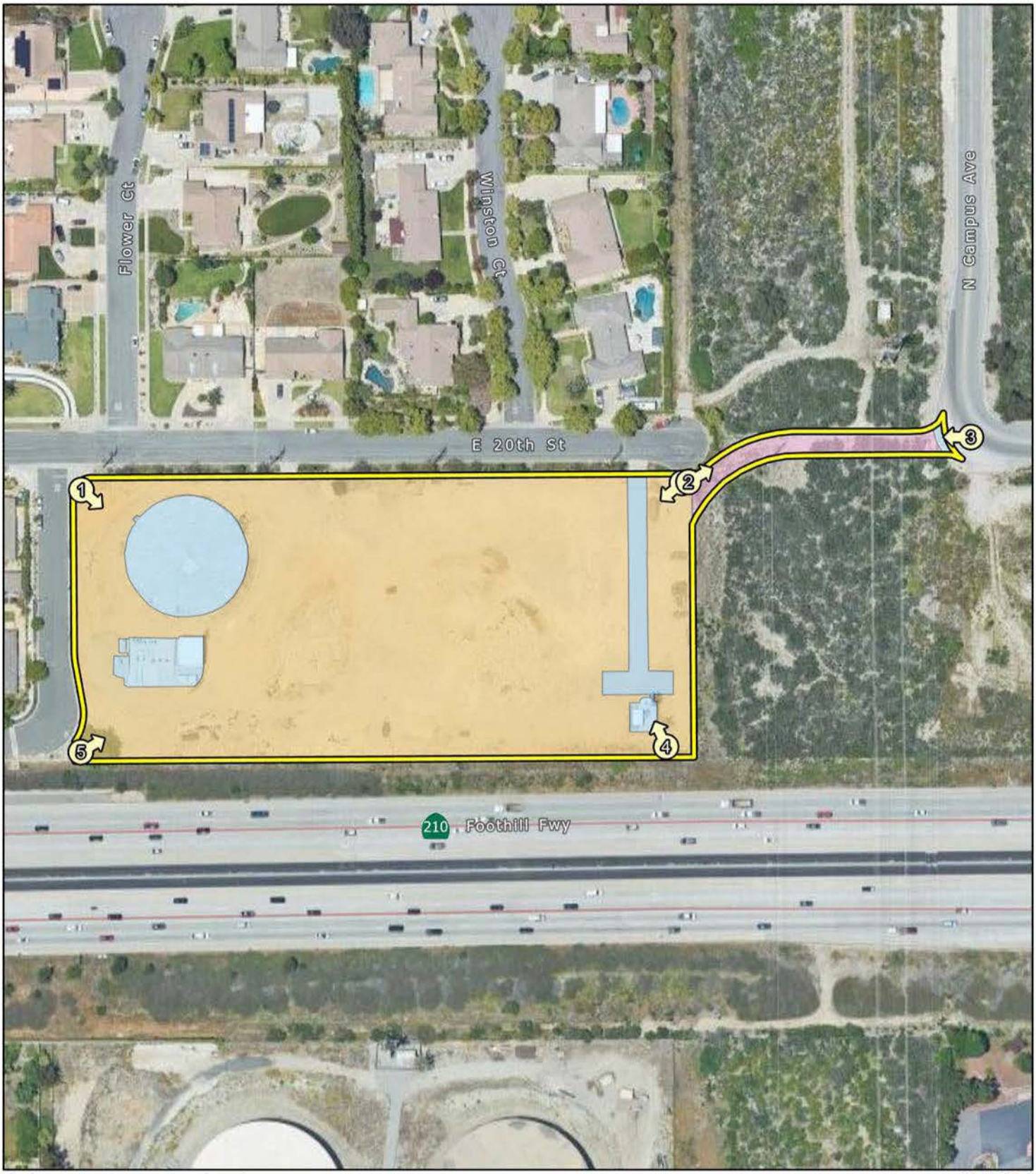

LSA

Project Location
Photo Point

Vegetation/Land Use
Developed
Disturbed
Scale Broom Scrub

FIGURE 4

N

0 75 150
FEET

SOURCE: Google Maps (2023)

San Antonio Water Company Headquarters
Vegetation, Land Cover, and Photo Points

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Photograph 1: View looking southeast along western boundary of Project site.

Photograph 2: View looking west along eastern boundary of Project site.

LSA

FIGURE 5

San Antonio Water Company Headquarters
Site Photographs

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Photograph 2.1: View looking northeast where Project road will exist.

Photograph 3: View looking west at scale broom scrub and where Project road will exist.

LSA

FIGURE 5

San Antonio Water Company Headquarters
Site Photographs

I:\2024\20241723\G\PhotoPage.cdr (8/19/2024)

Photograph 4: View looking north along eastern boundary of Project site.

Photograph 5: View looking east along western boundary of Project site.

LSA

FIGURE 5

San Antonio Water Company Headquarters
Site Photographs

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APPENDIX B

VASCULAR PLANT SPECIES OBSERVED

LSA biologist Chrissy Kent observed the following vascular plant species on the Project site.

EUDICOT FLOWERING PLANTS	
Asteraceae	**Sunflower family**
*Erigeron bonariensis**	Flax-leaved horseweed
Lepidospartum squamatum	Scalebroom
Chenopodiaceae	**Salt family**
Chenopodium sp.*	Clammy goosefoot
Crassulaceae	**Stonecrop family**
Crassula connata	Sand pygmyweed
Geraniaceae	**Geranium family**
*Erodium cicutarium**	Redstem stork's bill
Portulacaceae	**Purslane family**
*Portulaca oleracea**	Common purslane
Zygophyllaceae	**Gallweed family**
*Tribulus terrestris**	Puncture vine
MONOCOT FLOWERING PLANTS	
Poaceae	**Grass family**
*Bromus rubens**	Red brome
*Schismus barbatus**	Common Mediterranean grass

* Introduced species not native to California

Taxonomy and scientific nomenclature generally conform to Baldwin, B.G., D.H. Goldman et al., eds. (2012; The Jepson Manual: Vascular Plants of California, 2nd edition; University of California Press, Berkeley and Los Angeles, California).

Common names for each taxa generally conform to Roberts, F.M., Jr. (2008; The Vascular Plants of Orange County, California: An Annotated Checklist; F.M. Roberts Publications, San Luis Rey, California) except where Abrams, L. (1923, 1944, and 1951; Illustrated Flora of the Pacific States: Washington, Oregon, and California, vols. I–III; Stanford University Press, Stanford, California) and Abrams, L. and Ferris, R.S. (1960; Illustrated Flora of the Pacific States: Washington, Oregon, and California, vol. IV; Stanford University Press, Stanford, California) were used, particularly when species-specific common names were not identified in Roberts, F.M., Jr. (2008).

APPENDIX C

CULTURAL RESOURCES ASSESSMENT

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CULTURAL RESOURCES ASSESSMENT

SAN ANTONIO WATER COMPANY HEADQUARTERS PROJECT

UPLAND, SAN BERNARDINO COUNTY, CALIFORNIA

LSA

September 2024

CULTURAL RESOURCES ASSESSMENT

SAN ANTONIO WATER COMPANY HEADQUARTERS PROJECT

UPLAND, SAN BERNARDINO COUNTY, CALIFORNIA

Prepared for:

San Antonio Water Company
139 North Euclid Avenue
Upland, California 91786

Prepared by:

Casey Tibbet, M.A., and Riordan Goodwin, RA
LSA Associates, Inc.
1500 Iowa Avenue, Suite 200
Riverside, California 92507
(951) 781-9310

LSA Project No. 20241723

National Archaeological Database Information:

Type of Study: Records Search, Survey, Architectural Evaluation
USGS Quadrangle: *Mt Baldy, California*
Acreage: 5.12

LSA

September 2024

MANAGEMENT SUMMARY

LSA conducted a cultural resources assessment for the proposed San Antonio Water Company (SAWCo) Headquarters Project (Project) located at the southeast corner of East 20th Street and Flower Court (Assessor's Parcel Number [APN] 1044-091-22) in Upland, San Bernadino County, California. The subject property is approximately 5 acres in size and is currently developed with an underground water reservoir tank and related infrastructure. The Project involves developing an undeveloped portion of the subject property into a new headquarters for SAWCo, which will include two new buildings, a driveway from the intersection of Campus Avenue and East 20th Street, a vehicle gate, employee and visitor parking, a solar cover over the employee parking area, landscaping, and a citrus grove. The City of Upland (City), as Lead Agency for the Project, required this study as part of the environmental review process to comply with the California Environmental Quality Act (CEQA).

The purpose of the study is to provide the City with the necessary information and analysis to determine, as mandated by CEQA, whether the Project would cause substantial adverse changes to any historical/archaeological resources that may exist in or around the Project area. In order to identify and evaluate such resources, LSA conducted a historical/archaeological resources records search, pursued historical background research, and carried out intensive-level field surveys.

No archaeological resources are documented within 0.5 mile of the Project area, and none were identified during the archaeological survey. Despite the lack of surface visibility, the parcel has been severely disturbed, and the sensitivity for subsurface resources appears low.

One historic-period (50 years of age or older) built environment resource, a 1930 water reservoir, was documented in the Project area and evaluated under the criteria for listing in the California Register of Historical Resources (California Register) and for designation as a Cultural Resource under the City's Historic Preservation Ordinance (Chapter 17.26 of the City of Upland Municipal Code; Appendix A). As a result of this evaluation, LSA recommends that the water reservoir is not eligible for listing in the California Register or for designation under the local ordinance.

Through the various avenues of research, this study did not encounter any "historical resources," as defined by CEQA within the Project area. Therefore, LSA recommends to the City a finding of *No Impact* regarding cultural (historic or prehistoric) resources. No further cultural resources investigation and no mitigation measures are recommended for the Project unless development plans undergo such changes as to include areas not covered by this study. However, standard regulatory compliance measures regarding buried cultural resources are required in conformance with Section 15064.5(e) of the *State CEQA Guidelines*, Public Resources Code (PRC) Section 5097.98, and State Health and Safety Code Section 7050.5.

If buried cultural materials are encountered during earthmoving operations associated with the Project area, all work in that area should be halted or diverted until a qualified archaeologist can evaluate the nature and significance of the finds.

In the event human remains are encountered, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. The County Coroner must be notified of the find immediately. If the remains are determined to be Native American, the County Coroner will notify the Native American Heritage Commission (NAHC), which will determine and notify a Most Likely Descendant (MLD). With permission from the landowner or his/her authorized representative, the MLD may inspect the site of the discovery. The MLD shall complete the inspection within 48 hours of notification by the NAHC. The MLD will have the opportunity to offer recommendations for the disposition of the remains.

TABLE OF CONTENTS

MANAGEMENT SUMMARY i
TABLE OF CONTENTS iii
FIGURES AND TABLES iv
INTRODUCTION 1
SETTING 4
Current Natural Setting 4
Biology 4
Geology 4
Cultural Setting 4
Prehistory 4
Ethnography 5
History 5
METHODS 9
Records Search 9
Archival Research 9
Native American Consultation Assistance 9
Archaeological Field Survey 9
Architectural Survey 9
RESULTS 10
Records Search 10
Archival Research 10
Previous Studies 12
Native American Consultation Assistance 12
Archaeological Field Survey 12
Architectural Field Survey 12
SIGNIFICANCE EVALUATION 15
Definitions 15
California Register of Historical Resources 15
City of Upland—Chapter 17.26 Historic Preservation 16
Evaluation 16
RECOMMENDATIONS 19
REFERENCES 20

APPENDICES

A: DEPARTMENT OF PARKS AND RECREATION (DPR) 523 FORMS
B: RECORDS SEARCH RESULTS
C: NATIVE AMERICAN CONSULTATION ASSISTANCE

FIGURES AND TABLES

FIGURES

Figure 1: Regional and Project Location 2
Figure 2: Project Location 3

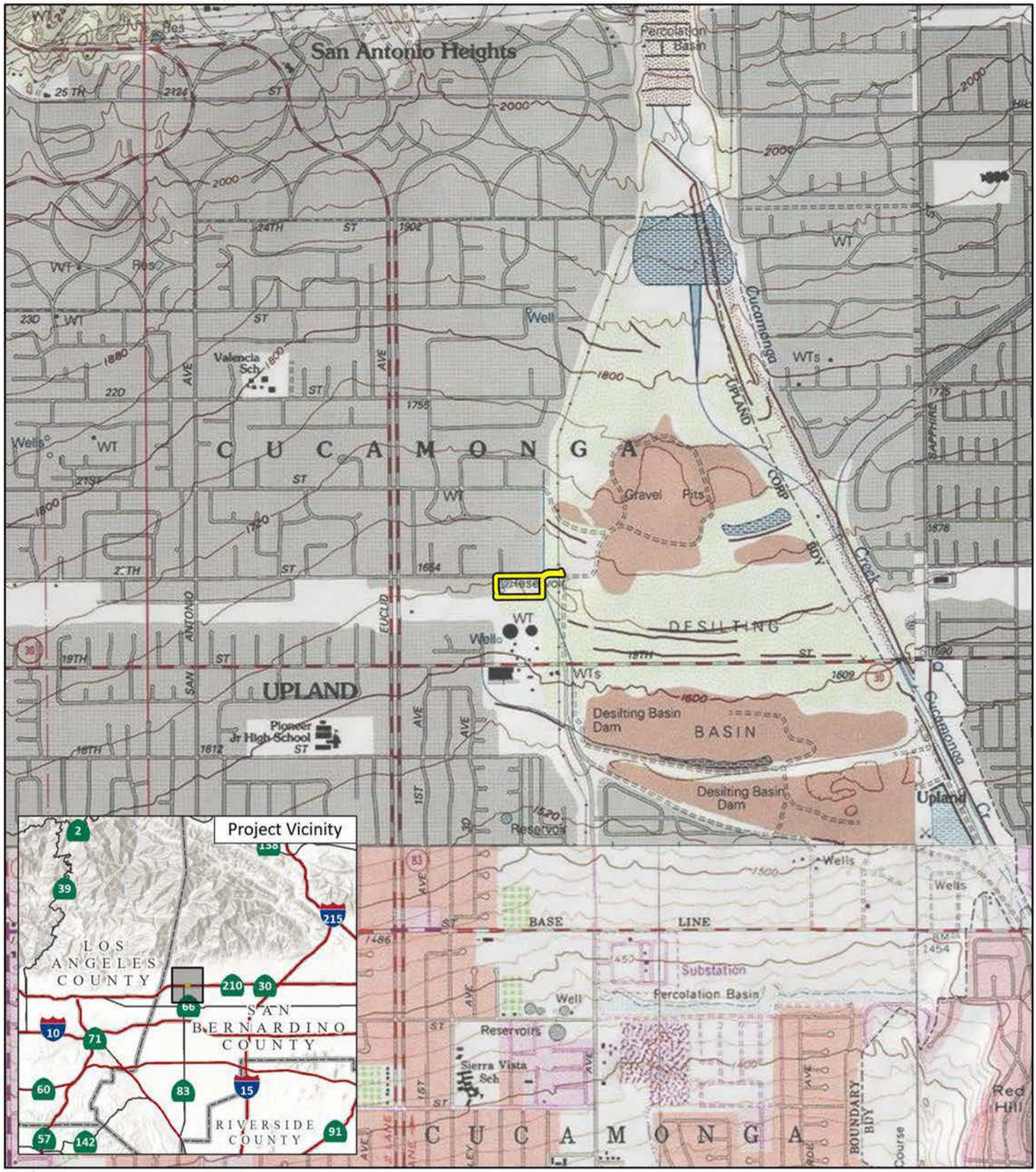
TABLE

Table A: Cultural Resources Within 0.5 Mile 10

INTRODUCTION

At the request of the San Antonio Water Company (SAWCo), LSA completed a cultural resources study on approximately 5 acres of land in the northeastern part of Upland, San Bernadino County, California (see Figures 1 and 2). The subject property of the study is located at the southeastern corner of East 20th Street and Flower Court (Assessor's Parcel Number [APN] 1044-091-22) in an unsectioned portion of Township 1 North, Range 7 West, San Bernardino Baseline and Meridian, as depicted on the United States Geological Survey (USGS) *Mt. Baldy, California* 7.5-minute topographic quadrangle map. The study is part of the environmental review process for the proposed development of an undeveloped portion of the subject property into a new SAWCo Headquarters Project (Project). The Project proposes two new buildings, a driveway from the intersection of Campus Avenue and East 20th Street, a vehicle gate, employee and visitor parking, a solar cover over the employee parking area, landscaping, and a citrus grove. The City of Upland (City), as Lead Agency for the Project, required the study in compliance with California Environmental Quality Act (CEQA) (Public Resource Code [PRC] § 21000, et seq.) and the City's Historic Preservation Ordinance (Chapter 17.26 of the City of Upland Municipal Code).

LSA performed the present study to provide the City with the necessary information and analysis to determine, as mandated by CEQA, whether the proposed Project would cause substantial adverse changes to any historical/archaeological resources that may exist in or around the Project area. In order to identify and evaluate such resources, LSA conducted a historical/archaeological resources records search, pursued historical background research, and carried out intensive-level field surveys. This report is a complete account of the methods, results, and final conclusion of the study.



LSA

FIGURE 1

0 1000 2000
FEET

San Antonio Water Company Headquarters

Project Location and Vicinity

SOURCE: *Mt. Baldy CA*, 7.5' Quad (USGS 1988)

I:\2024\20241723\GIS\Pro\San Antonio Water Company Headquarters\San Antonio Water Company Headquarters.aprx (8/21/2024)

LSA

Project Location

FIGURE 2

N

0 100 200
FEET

SOURCE: Google Imagery (2024)

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San Antonio Water Company Headquarters

Project Location

SETTING

CURRENT NATURAL SETTING

Biology

At an elevation of approximately 1,600 feet above mean sea level (amsl), the Project is within the Lower Sonoran Life Zone of California (Schoenherr 1992), which ranges from below sea level to 3,500 feet amsl. Species such as mustard, red brome, Russian thistle, hare oats, and xeric grasses were noted on the property. Common animals of this region include rodents, rabbits, coyotes, raptors, reptiles, vultures, and insects.

Geology

The Project is located at the northern end of the Peninsular Ranges Geomorphic Province that extends from the Transverse Ranges to the tip of Baja California and includes the Los Angeles Basin (California Geological Survey 2002; Norris and Webb 1976). This region is characterized by a series of mountain ranges separated by northwest-trending valleys subparallel to faults branching from the San Andreas Fault. The geology of this province is similar to that of the Sierra Nevada, with numerous rock outcroppings useful to the Native Americans for resource milling, shelter, and ceremonial art.

CULTURAL SETTING

Prehistory

Chronologies of prehistoric cultural change in Southern California have been attempted numerous times, and several are reviewed in Moratto (1984). No single description is universally accepted, as the various chronologies are based primarily on material developments identified by researchers familiar with sites in a particular region and variation exists essentially due to the differences in those items found at the sites. Small differences occur over time and space, which combine to form patterns that are variously interpreted.

Currently, two primary regional culture chronology syntheses are commonly referenced in the archaeological literature. The first, Wallace (1955), describes four cultural horizons or time periods: Horizon I – Early Man (9000–6000 BC), Horizon II – Milling Stone Assemblages (6000–3000 BC), Horizon III – Intermediate Cultures (3000 BC–AD 500), and Horizon IV – Late Prehistoric Cultures (AD 500–historic contact). This chronology was refined (Wallace 1978) using absolute chronological dates obtained after 1955.

The second cultural chronology (Warren 1968) is based broadly on Southern California prehistoric cultures and was also revised (Warren 1984; Warren and Crabtree 1986). Warren's (1984) chronology includes five periods in prehistory: Lake Mojave (7000–5000 BC), Pinto (5000–2000 BC), Gypsum (2000 BC–AD 500), Saratoga Springs (AD 500–1200), and Protohistoric (AD 1200–historic contact). Changes in settlement pattern and subsistence focus are viewed as cultural adaptations to a changing environment, which begins with gradual environmental warming in the late Pleistocene, continues with the desiccation of the desert lakes, followed by a brief return to pluvial conditions,

and concludes with a general warming and drying trend, with periodic reversals that continue to the present (Warren and Crabtree 1986).

Ethnography

The study area is within the traditional cultural territory of the Gabrielino (Kroeber 1925; Heizer 1968). Tribal territories were somewhat fluid and changed over time. The first written accounts of the Gabrielino are attributed to the Spanish mission fathers, and later documentation was by Johnston (1962), Blackburn (1962–1963), Hudson (1971), and others.

Gabrielino

The territory of the Gabrielino included portions of Los Angeles, Orange, and San Bernardino counties during ethnohistoric times, and extended inland into northwestern Riverside County (Kroeber 1925; Heizer 1968). It encompassed an extremely diverse environment that included coastal beaches, lagoons and marshes, inland river valleys, foothills and mountains (Bean and Shipek 1978).

The Gabrielino caught and collected seasonally available food resources, and led a semi-sedentary lifestyle, living in permanent communities along inland watercourses and coastal estuaries. Individuals from these villages took advantage of the varied resources available. Groups moved to temporary camps on a seasonal rotation to collect plant foods such as acorns, buckwheat, chía, berries, and fruits, and to conduct communal rabbit and deer hunts. They also established seasonal camps along the coast and near bays and estuaries to gather shellfish and hunt waterfowl (Hudson 1971).

The Gabrielino lived in small communities, which were the focus of family life. Patrilineally linked, extended families occupied each village (Kroeber 1925; Bean and Smith 1978). Both clans and villages were apparently exogamous, marrying individuals from outside the clan or village (Heizer 1968). Gabrielino villages were politically independent and were administered by a chief, who inherited his position from his father. Shamans guided religious and medical activities, while group hunting or fishing was supervised by individual male specialists (Bean and Smith 1978).

The nearest historically known Native American village to the Project area was the Gabrielino community of *Tooypinga* (also described to Alfred Kroeber as *Toibi*), 2.7 miles to the south in the general area of Pomona (Kroeber 1925; McCawley 1996).

History

The historic period in California is generally divided into three periods: Spanish/Mission (1776–1821), Mexican/Rancho (1821–1846), and American (1846–present). Because the resource being evaluated dates to 1933 (Historicaerials.com var), the early periods are only briefly discussed. Instead, the following historical overview is focused on the settlement and development of Upland.

Spanish, Mexican, and Early American Periods

Upland is situated along a trail once used by Native Americans and Spanish missionaries now known as the Old Spanish Trail (Masters 2011). In 1774, Juan Bautista de Anza, a Spanish explorer,

established an overland route from Arizona to California that passed through today's Upland en route to the San Gabriel mission (Anonymous 2024a). This route was later used for expeditions that founded San Francisco and Los Angeles (Ibid.). Mission San Gabriel became an important place for expeditions traveling between Arizona and California since it was the first place where supplies could be obtained after crossing the desert (Ibid.). In 1810, under the leadership of Padre Dumetz, a collection of missionaries, soldiers, and Native Americans from the mission set out to locate an intermediary spot for a supply station, which they found in an area they named the San Bernardino Valley (Ibid.). They also named the area around Upland Cucamonga (Ibid.).

In 1821, Mexico won independence from Spain and gained control over California. In 1826, Jedediah Smith was the first American to enter California overland (Anonymous 2024a). He pioneered the route over the Cajon Pass and then followed Anza's route to San Gabriel. A few years later, in 1829, Antonio Armijo led an expedition from Santa Fe, New Mexico, that partially followed Smith's and Anza's routes (Ibid.). The success of this trip resulted in commerce between Santa Fe and Los Angeles, which meant travelers crossed through Cucamonga, Upland, and El Monte on their journeys (Ibid.).

During the Spanish Period, the Mission San Gabriel had established the area around today's Upland as grazing land for their cattle (Anonymous 2024b). In 1839, during the Mexican Period, this area was granted to Tiburcio Tapia by the Mexican governor (Ibid.). Known as the Cucamonga Rancho, it consisted of approximately 13,000 acres and formed parts of today's cities of Rancho Cucamonga and Upland.

In 1846, California became part of the United States. The Gold Rush of 1849 brought numerous settlers to California, but the Upland area remained relatively uninhabited and primarily used for grazing into the early 1880s.

City of Upland

Except where noted, the following was excerpted from the History of Early Upland (Upland Heritage 2024).

The Cucamonga Rancho changed hands several times, but, as noted above, the area that present-day Upland occupies was little more than an uninhabited ranchland and a place to pass through until the arrival of George and William Chaffey in 1882. George Chaffey, a Canadian shipbuilder from the province of Ontario, had already established the Etiwanda irrigation community in 1881, irrigating the land with a series of flumes that carried water from the mountains to a reservoir from which water would then be sent to the relative land sites. In 1882, Chaffey purchased 6,216 acres of land in the Cucamonga Rancho, along with significant water rights from San Antonio Creek, for $60,000. Additional purchases brought the size of the land to over 8,000 acres for a total purchase price of $90,000. The Chaffeys' master plan called for distributing the water over the whole tract to each farm lot in cement pipes, with each holder to share in the water proportionately to his holding irrespective of distance from the source. Also in 1882, the Chaffeys laid out the main thoroughfare for the "Model Irrigation Colony" (also known as Ontario) which ran from one end of the settlement to the other (City of Ontario 2013). The thoroughfare was named Euclid in honor of George's favorite mathematician.

Euclid Avenue, which is approximately 0.25 mile west of the Project area, was 7 miles long and planned as a 200-foot-wide avenue with a center parkway flanked by a 65-foot-wide drive on each side. The avenue stretched from the colony's southernmost boundaries to the "tableland at the mouth of San Antonio Canyon on the north," an ideal location for gravity irrigation (City of Ontario n.d.). The first 4 miles of the avenue were completed in 1884 (City of Ontario 2013). Chaffey also planned for electricity in Ontario with streetlights being placed 1 mile apart on Euclid and an electric streetcar that would travel up and down the avenue daily.

Ontario was available for settlement on November 1, 1882. During the first week, Chaffey sold 190 acres for a total value of $28,500. To ensure the success of this irrigation plan and to appeal to potential land buyers, the Chaffeys created a "mutual water company" in which each landowner became a stockholder. The San Antonio Water Company was incorporated on October 25, 1882. The Ontario colony eventually became known for its citrus groves, but in 1882, orange trees were too scarce and expensive at $100 an acre to turn to citrus, so at first other types of fruit were planted. By 1884, Ontario Nursery owner D.A. Shaw reported that there were 40,000 peach trees, 29,000 pear trees, 15,000 seedling apple trees, 16,000 grafted apple trees, 1,000 cherry trees, and 16,000 grape cuttings set out in orchards and vineyards. However, by 1889, some 2,000 acres of citrus orchards had been planted in Ontario, and Ontario was rated as having the second largest citrus acreage in the State.

The present-day City was originally the northern part of Chaffey's Ontario Model Colony and was known as North Ontario and sometimes as Magnolia after a local hotel. Many documents (e.g., deeds and census records) refer to the area as Mongolia Township, but it was Magnolia Tract that was the correct reference. However, there was another city in California named Magnolia, so the name had to be changed. The name Upland was first used as the name of the Upland Citrus Association, but by 1902, the entire area of North Ontario was referred to as Upland.

The railway came to North Ontario in 1887. When the Ontario Colony was founded, downtown was located next to the Southern Pacific tracks. In 1887, the Atchison, Topeka, and Santa Fe completed its connection adjacent to the newly founded Magnolia Tract in North Ontario. Subdividers of Magnolia, the Bedford Brothers, announced plans to erect a depot at the foot of Second Avenue, the primary business street. A notice in the December 1887 *Ontario Record* indicated that the cost of the station would be $7,000. In the next decades numerous packing houses were built close to the tracks on both sides of A Street, nearly 3 miles south of the Project area. Used for commuting of residents and tourists as well as for freight, the railroad linked Upland to Los Angeles to the west and the rest of the Santa Fe network to the east.

Ontario officially incorporated in 1891, but the size of incorporation was relatively small: half of a square mile bordered by the Southern Pacific tract to the south, G Street to the north, Sultana Avenue to the east, and Vine Avenue to the west. In 1901, residents of Ontario learned that those living in North Ontario were also thinking of incorporating as their own city. To eliminate this possibility, the City expanded their half of a square mile to over 10 square miles. When Ontario started to push for a larger area of incorporation, Upland residents expressed concern. The area that Ontario wanted included the Upland Post Office; the tracks for the Atchison, Topeka, and Santa Fe Railroad; and the train depot. On March 12, 1906, the San Bernardino Board of Supervisors conducted a 2-day hearing and agreed that a vote for incorporation should take place. On May 5,

1906, Upland approved their vote for incorporation with 183 in favor and 19 against. The City was officially created on May 15, 1906, by the Secretary of State in Sacramento. In 1935, Upland's boundary lines were redrawn to include the land that was annexed in Ontario's 1902 expansion.

In the decade following incorporation, the City built its first hospital (1907), and the local citizens created a volunteer fire department (1911) and built the City's first fire station (1915) (Anonymous 2024a). In 1912, the National Old Trails Road (NOTR) was established as the first national coast-to-coast highway, and it ran through Upland along today's Foothill Boulevard (Ibid.). The NOTR followed the early Spanish explorers' route, and, in 1926, the western portion became part of Route 66. A mule-pulled trolley, which was later converted to electricity, went from Ontario to Upland along the Euclid Avenue median; it was discontinued in 1928 (Ibid.). The citrus industry thrived in Upland and neighboring communities throughout the early part of the 20th century and was the dominate crop by the 1930s (Ibid.). At the height of production, the California citrus "industry produced sixty percent of the nation's citrus and twenty percent of the world's supply" (Ibid.). This success continued until the end of World War II when land values increased dramatically and citrus groves throughout Southern California gave way to housing tracts. The San Bernardino Freeway (Interstate 10) was completed in 1954, reducing travel time between San Bernardino and Los Angeles and accelerating Upland's transition from a rural, citrus growing community to the suburban city it is today (Ibid.).

METHODS

RECORDS SEARCH

On July 11, 2024, a cultural resources record search was conducted for the Project area at the South Central Coastal Information Center (SCCIC) at California State University, Fullerton. It included a review of all recorded historic and prehistoric archaeological sites and cultural resource reports within 1 mile of the Project area.

ARCHIVAL RESEARCH

LSA completed archival research during the months of August and September 2024. Research methodology focused on the review of a variety of primary and secondary source materials relating to the history and development of the Project area. Sources included, but were not limited to, online sources, published literature in local and regional history, news articles, historic aerial photographs, and historic maps.

NATIVE AMERICAN CONSULTATION ASSISTANCE

On July 8, 2024, the results of a request for a search of the Sacred Lands File (SLF) were received from the Native American Heritage Commission (NAHC), who indicated that the results in the vicinity of the Project area were positive and provided a list of 25 recommended contacts representing local Native American tribes. Pending finalization of initial contact letters, all of the contacts designated by the NAHC, along with four individuals representing three groups specified by the City, will be notified via official letters by the City to solicit Section 106, Assembly Bill (AB) 52, and Senate Bill (SB) 18 consultation (see Appendix C for details of the SLF search and a representative sample of draft letters to tribes).

ARCHAEOLOGICAL FIELD SURVEY

The pedestrian survey for the Project was conducted on July 30, 2024, by LSA Archaeologist Cassidy Sharp utilizing 10-meter transects. The Project site was photographed using a digital format camera.

ARCHITECTURAL SURVEY

On August 6, 2024, LSA architectural historian Casey Tibbet and field photographer Dennis Lechner conducted the intensive-level architectural survey. During the survey, Mr. Lechner took digital photographs of the Project area, focusing mainly on the water reservoir. In addition, Ms. Tibbet made detailed notations regarding the materials, design characteristics, and current condition of the water reservoir. She also observed the remainder of the Project area and the adjacent properties, which include modern residences, undeveloped land, and Route 210.

RESULTS

RECORDS SEARCH

Data from the SCCIC indicate there have been 11 cultural resource studies previously conducted within 0.5 mile of the proposed Project, 4 of which included portions or the entirety of the Project area (SB-01595, SB-02530, SB-05800, and SB-057873; see Appendix B). Two cultural resources are documented within or partially within the Project area (36-006255 and 36-020141), and 12 others are recorded within 0.5 mile. All were documented in the built environment (see Table A).

Table A: Cultural Resources Within 0.5 Mile

Primary #	Trinomial #	Site Description	Status Codes
36-006255	CA-SBR-006255/H	Historic-period Cucamonga Spreading Grounds	—
36-015982*		Roadway segment (Euclid Avenue), route c. 1883	7W (segment in Ontario outside Project area)
36-015983		Railroad route (mule car track on Euclid Avenue) c. 1887	—
36-018105*		430 East 19th Street c. 1936 commercial building	7M
36-018592		1891 North Euclid Avenue c. 1924 residence	—
36-018593		1894 North Euclid Avenue c. 1908 residence	—
36-018594		1936 North Euclid Avenue c. 1931 residence	—
36-018595		1960 North Euclid Avenue c. 1896 residence	—
36-018596		1997 North Euclid Avenue c. 1906 residence	—
36-018597		2008 North Euclid Avenue c. 1912 residence	—
36-018598		2009 North Euclid Avenue c. 1927 residence	—
36-018599		2031 North Euclid Avenue c. 1929 residence	—
36-020140		216 East 20th Street c. 1945 residence	
36-020141		Reservoir (water tank) c. 1930	

Source: South Central Coastal Information Center (2024).
*Listed in the Built Environment Resources Directory

ARCHIVAL RESEARCH

In 1882, George and William Chaffey incorporated SAWCo (Upland Heritage 2024). Intended to appeal to potential land buyers, this “mutual water company” made each landowner a stockholder and was the second mutual water company to be formed in California (Ibid.; SAWCo 2024a).
A December 1882 news article stated that SAWCo would “construct a reservoir on the northern part of the colony of Ontario” that would “hold a sufficient supply for distribution over the lands sold and to be sold in said colony” (*Ontario Fruit Grower* 1882a). Furthermore, waters were to be conveyed from San Antonio Canyon or Creek to the reservoir “as rapidly as the lands sold” and be “ready for irrigation to the highest corner on each 10-acre lot owned by the stockholders” of the SAWCo (Ibid.). This was to occur no later than July 15, 1883 (Ibid.). The Chaffey brothers transferred one share of stock with each acre sold (*Ontario Fruit Grower* 1882b). An 1882 map of the Ontario Colony Lands shows 1,023 lots, a grid pattern of streets including Euclid Avenue, a planned college campus at the northwest corner of Euclid Avenue and 4th Street, and a reservoir located in the foothills northwest of Euclid Avenue (The Claremont Colleges n.d.).

A November 1883 news article stated that progress was being made on the Ontario water system. According to the article, men were working day and night building an approximately 4,000-foot-long tunnel, an approximately 1,500-foot-long cement ditch, and installing nearly 3,000 feet of cement pipe (*Ontario Fruit Grower* 1883). In addition, more than 2,000 feet of canal was under construction from the tunnel to the north end of Euclid Avenue where waters would be dropped into a reservoir (Ibid.). By May 1884, referring to the mutual water company system used in Redlands, Etiwanda, and Ontario, the *Ontario Fruit Grower* stated that the system "seems to be perfect" (*Ontario Fruit Grower* 1884). Later articles (late 1880s into the 1890s) tout the excellent water supply as an important part of the success of Ontario as a fruit growing colony.

In summer 1928, it was reported that SAWCo adopted a recommendation that "a reservoir to equalize the flow and prevent fluctuation of the heads, be constructed on the Nineteenth street well pipe line just west of Campus avenue and Twentieth street [in the Project area] and that booster pumps be installed there and a steel booster line constructed from that point north to Twenty-second street and west thereon to San Antonio avenue. This would permit boosting water to the upper section in periods of shortage or if the East Twenty-third street pump should break down. Estimated cost, $44,530" (*The Daily Report* 1928). The company also adopted recommendations to install a similar reservoir, booster pumps, and booster line on the 16th Street well pipeline and develop a well at or near 4th Avenue and San Antonio Avenue in the Chino basin (Ibid.).

According to SAWCo, the reservoir, which is known as Reservoir 1, is a 1-million-gallon tank that was built in the 1930s to provide irrigation water for the local citrus groves (SAWCo 2024b). Although no news articles regarding the construction process or its completion were found, 1930 advertisements related to Schulhof ranch reference the "new reservoir" east of Euclid Avenue and north of 19th Street (*The Daily Report* 1930). The Schulhof ranch residence was located on the northwest corner of 20th Street and Sapphire Street (now Flower Court). The reservoir first appears on topographic maps dated 1933 and is clearly visible in aerial photographs from 1938 (Historicaerials.com var.). The lands adjacent to the Project area to the west and north were cultivated with agricultural uses that likely dated to at least the 1890s, when they were owned and farmed by early pioneer Hugo Sontag (*San Bernardino County Sun* 1923). Sontag was reportedly producing Zinfandel grapes on the property as early as 1886 and built his stone cabin there in 1889 (*The Ontario Record* 1886; *San Bernardino County Sun* 1924). The ranch was purchased from Sontag by the Schulhof family in 1923 (*San Bernardino County Sun* 1923). Research indicates they operated the ranch, where they grew fruits, nuts, and melons, until the mid-1970s (*San Bernardino County Sun* 1923, 1974). Today, Reservoir 1 is primarily used to supply nonpotable water to Holliday Rock Quarry, located approximately 400 feet to the east of the Project area, generally at the northeast corner of East 20th Street and North Campus Avenue (SAWCo 2024b).

Historic aerial photographs reveal that in 1938, lands to the north and west of the Project area were developed with groves, while the property to the south and east was largely undeveloped (Historicaerials.com var.). By the mid-1960s, there was a new water tank south of the Project area and some residential development southwest of it, but it was not until after 1985 that the nearby groves disappeared completely (Ibid.). Although there were two above-ground tanks (still extant) south of the 1930 reservoir by the mid-1990s, the Project area appears to have remained largely undeveloped (Ibid.). Route 210 was constructed adjacent to the south of the Project area by 2005;

at that time, the reservoir appears to be the only structure on site (Ibid.). The residences on East Kenwood Street and Flower Court, south of East 20th Street and adjacent to the west of the Project area, were not constructed until after 2012 (Ibid.).

Previous Studies

In 1988, the subject reservoir (36-020141) was documented and evaluated by the California Department of Transportation (Caltrans) as not eligible for listing in the National Register of Historic Places (National Register) (Parks and Gallup 1988; see Appendix A). At that time, it was noted that the reservoir was in excellent condition and still supplied irrigation water to the few remaining citrus groves in the immediate vicinity. However, it was one of many such facilities in the area and did not appear to have "made significant individual contributions to local history and development" (Parks and Gallup 1988:2).

In 1989, an Archaeological Site Record was prepared for the Cucamonga Spreading Grounds (36-006255) located north and east of the Project area. The Archeological Site Location Map associated with that documentation includes the subject property (Hammond 1989:9). The site record states that "A concrete circular reservoir (Reservoir 1) recorded during the Historical Architectural Survey for this project is associated with the Cucamonga Spreading grounds. Water from well Nos. 14 and 19, (located east of the spreading grounds, between 19th St and 20th St), traveled to the reservoir via a 22" San Antonio Water Company Pipeline, which is aligned along Distributing Ditch No. 4" (Hammond 1989:3). The Archaeological Site Record did not evaluate the reservoir or the spreading grounds.

In 2014, a water system associated with the Cucamonga Spreading Grounds was documented on a Department of Parks and Recreation (DPR) 523 form but was not evaluated for significance (ECORP 2014).

NATIVE AMERICAN CONSULTATION ASSISTANCE

Please see Appendix C for results of the SLF search and consultation assistance. Please note consultation is an ongoing process throughout the life of the Project, and, as such, the City will continue to consult with any interested Native American Tribes as the Project moves forward.

ARCHAEOLOGICAL FIELD SURVEY

The July 30, 2024, field survey revealed that there was severe disturbance in the area caused by earth-moving and development. Although overall visibility of the surface was 100 percent, no intact native soil was exposed because it was completely obscured by a highly disturbed dirt surface and modern development (see Photos 1 through 3). Access was easily gained via gate. Construction and concrete debris were noted throughout the Project area. No cultural resources were identified.

ARCHITECTURAL FIELD SURVEY

During the architectural field survey, the following were observed in the Project area: a partially subterranean water reservoir, a modern metal building, a metal cargo container, a concrete slab with metal cabinets, large pipes, various equipment, and piles of rubble (see Photos 1 through 3).

A solid wall surrounds the property and screens it from view from the public right-of-way. Aside from the water reservoir, all of the built environment features in the Project area are modern. The setting consists of modern single-family residences to the north and west, Route 210 to the south, and undeveloped land to the east and northeast. The historic-period water reservoir is described below. Photographs were taken by reaching over the wall.

The water reservoir is located in the northwestern part of the Project area. It is round and approximately 130 feet in diameter. Depending on the terrain, approximately 2 to 3 feet of the reservoir, including the roof, are above grade. The reservoir wall is concrete. There is a wood truss system mounted on top of the wall to support the roof. The conical roof has a very slight pitch, is sheathed with composition sheets, extends slightly beyond the reservoir walls, and has a center-mounted monitor (see Photo 1). There is a large, in-ground, elbow pipe that enters the reservoir on the west side (see Photo 1). There is also a board-formed concrete box on the northwest side of the reservoir (see Photo 1). Equipment is attached to the northeast side of the reservoir (see Photo 2).

Photo 1: *Water reservoir, view east (8/6/24).*

Photo 2: *Equipment on the northeast side of the reservoir, view southwest (8/6/24).*

Photo 3: *Water reservoir behind (north of) modern building and equipment, view northeast (8/6/24).*

SIGNIFICANCE EVALUATION

Based on the research results discussed above, the following sections present the historical significance evaluation for the historic-period water reservoir in the Project area and the conclusion on whether it qualifies as a "historical resource" as defined by CEQA.

DEFINITIONS

CEQA (PRC Chapter 2.6, Section 21083.2 and California Code of Regulations [CCR] Title 145, Chapter 3, Article 5, Section 15064.5) calls for the evaluation and recordation of historical resources. The criteria for determining the significance of impacts to historical resources are based on Section 15064.5 of the *State CEQA Guidelines* and Guidelines for the Nomination of Properties to the California Register. Properties eligible for listing in the California Register of Historical Resources (California Register) and subject to review under CEQA are those meeting the criteria for listing in the California Register or National Register, or designation under a local ordinance.

California Register of Historical Resources

The California Register criteria are based on National Register criteria. For a property to be eligible for inclusion in the California Register, one or more of the following criteria must be met:

1. It is associated with the events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States;

2. It is associated with the lives of persons important to local, California, or national history;

3. It embodies the distinctive characteristics of a type, period, region, or method or construction, or represents the work of a master, or possesses high artistic values; and/or

4. It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

In addition to meeting one or more of the above criteria, the California Register requires that sufficient time has passed since a resource's period of significance to "obtain a scholarly perspective on the events or individuals associated with the resource." Fifty years is used as a general estimate of time needed to develop the perspective to understand the resource's significance (CCR 4852 [d][2]).

The California Register also requires that a resource possess integrity, which is defined as "the authenticity of an historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance" (California Office of Historic Preservation 1999:2). To retain integrity, a resource should have its original location, design, setting, materials, workmanship, feeling, and association. Which of these factors is most important depends on the particular criterion under which the resource is considered eligible for listing (California Office of Historic Preservation 1999).

City of Upland—Chapter 17.26 Historic Preservation

The City of Upland provides the criteria for designating a cultural resource to the Local Register (Chapter 17.26.100(F)). The cultural resource must meet one or more of the following criteria:

1. It embodies distinguishing architectural characteristics, valuable to the study of a period, style, method of construction, or the use of indigenous materials or craftsmanship.

2. It exemplifies, symbolizes, or manifests elements of the cultural, social, economic, political, or architectural history of the city.

3. It is identified with historic persons or with important events in local, state, or national history.

4. It is representative of the work or product of a notable builder, designer, or architect.

5. Its unique location or singular physical characteristics represent an established and familiar visual feature of a neighborhood.

6. It contributes to the continuity or character of a visually or thematically cohesive street, neighborhood, or area.

7. It has integrity as a natural or manmade environment that strongly contributes to the well-being of the people of the community.

EVALUATION

In summary, the Project area includes a historic-period, concrete reservoir that is predominantly subterranean. Known as Reservoir 1, it was built in 1930 by SAWCo to provide irrigation water to local citrus groves. Originally, its setting included undeveloped land to the northeast, east, and south and groves to the north, west, and southwest. Today, there are modern residential neighborhoods to the north and west, a modern section of Route 210 to the south, a small piece of undeveloped land to the east, and a rock quarry to the northeast. The reservoir's primary purpose now is to provide nonpotable water to the nearby Holliday Rock Quarry. The reservoir is evaluated below using the California Register and City criteria.

Many of the City's criteria for designation are similar to those of the California Register. Where appropriate, these have been grouped together to avoid redundancy.

California Register Criterion 1: It is associated with the events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.

City Criterion 3: It is identified with historic persons or with important events in local, state, or national history.

This reservoir is associated with SAWCo which was incorporated in 1882 and developed a water system that played a critical role in the early settlement and development of the City and

neighboring Ontario. However, this reservoir, which was built in 1930, nearly 50 years after the company incorporated, did not contribute to the early success of the community. It is one of many facilities built by the company over several decades to support the continued growth of the area. No indication was found that it made any important contributions to local history or development. It is not significant under these criteria.

California Register Criterion 2: It is associated with the lives of persons important to local, California, or national history.

City Criterion 3: It is identified with historic persons or with important events in local, state, or national history.

No evidence was found that this reservoir is associated with historically significant people. It is not significant under these criteria.

California Register Criterion 3: It embodies the distinctive characteristics of a type, period, region, or method or construction, or represents the work of a master, or possesses high artistic values.

City Criterion 4: It is representative of the work or product of a notable builder, designer, or architect.

The reservoir is identifiable as an early 20th century reservoir based on its construction materials (poured in place concrete and wood truss roof supports). However, those materials and the related methods of construction are common for the period and region. No evidence was found that the reservoir is the work of a master engineer or builder, and it does not possess high artistic values. It is not significant under these criteria.

California Register Criterion 4: It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the Nation.

City Criterion 1: It embodies distinguishing architectural characteristics, valuable to the study of a period, style, method of construction, or the use of indigenous materials or craftsmanship.

The reservoir was built in 1930 using common methods and materials and is not valuable to the study of a period, style, method of construction, or the use of indigenous materials or craftsmanship. It does not have the potential to yield information important to the prehistory or history of the area. It is not significant under these criteria.

The following addresses the remaining City criteria for designation.

City Criterion 2: It exemplifies, symbolizes, or manifests elements of the cultural, social, economic, political, or architectural history of the city.

The reservoir is one element of the SAWCo water system that played an important role in the development of the Ontario and Upland communities in the late 1800s and early 1900s. As a relatively late piece of infrastructure (1930), this reservoir is not associated with the early

settlement of those communities and did not play a role in the development or success of the citrus industry. It does not exemplify or symbolize that system and is not significant under this criterion.

City Criterion 5: Its unique location or singular physical characteristics represent an established and familiar visual feature of a neighborhood.

The reservoir has existed in this location for nearly 100 years. However, there is nothing unique about its location and it does not have unusual physical characteristics that cause it to stand out. Furthermore, because it is mostly subterranean it has never been particularly visible from beyond its immediate surroundings. For these reasons, despite its long history in this location, it is not a familiar visual feature. It is not significant under this criterion.

City Criterion 6: It contributes to the continuity or character of a visually or thematically cohesive street, neighborhood, or area.

The reservoir was constructed in 1930, when the surrounding area was developed with citrus groves. Today, the area is developed with modern homes that have no relationship to the agricultural past of the area or the reservoir. It is not significant under this criterion.

City Criterion 7: It has integrity as a natural or manmade environment that strongly contributes to the well-being of the people of the community.

The reservoir is part of the manmade environment. Originally, it contributed to the irrigation system that supported nearby citrus groves. Today, it supports the quarry located to the northeast. It is not strongly connected to the well-being of the people in the community. It is not significant under this criterion.

RECOMMENDATIONS

The foregoing report has provided background information on the Project area, outlined the methods used in the current study, and presented the results of the various avenues of research. The only historic-period (50 years of age or older) resource that was identified in the Project area is a mostly subterranean, concrete water reservoir that was built in 1930 as part of the irrigation system for nearby citrus groves. The reservoir was evaluated for historical significance using the criteria for listing in the California Register and designation as a City Cultural Resource. It did not meet any of the State or local criteria.

No archaeological resources are documented within a 0.5 mile, and none were identified during the archaeological survey. Despite the lack of surface visibility, the parcel has been severely disturbed and the sensitivity for subsurface resources appears low.

Throughout the course of the study, no "historical resources," as defined by CEQA, were encountered within or adjacent to the Project area. Therefore, the City may reach a finding of *No Impact* regarding cultural (historic or prehistoric) resources. No mitigation measures are recommended for cultural resources. However, the following standard regulatory compliance measures regarding buried cultural resources are required in conformance with Section 15064.5(e) of the *State CEQA Guidelines*, PRC Section 5097.98, and State Health and Safety Code Section 7050.5.

- In the event that archaeological materials are encountered during construction, all construction work should be halted and a qualified archaeologist consulted to determine the appropriate treatment of the discovery (CCR Title 14, Chapter 3, Section 15064.5(f)).

- In the event human remains are encountered, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to PRC Section 5097.98. The County Coroner must be notified of the find immediately. If the remains are determined to be Native American, the County Coroner will notify the NAHC, which will determine and notify a Most Likely Descendant (MLD). With permission from the landowner or his/her authorized representative, the MLD may inspect the site of the discovery. The MLD shall complete the inspection within 48 hours of notification by the NAHC. The MLD will have the opportunity to offer recommendations for the disposition of the remains.

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APPENDIX A

DEPARTMENT OF PARKS AND RECREATION (DPR) 523 FORMS

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # 36-020141
HRI #
Trinomial
NRHP Status Code 6Z
Other Listings
Review Code Reviewer Date

 Resource Name or #: Reservoir #1

P1. Other Identifier: San Antonio Water Company Reservoir #1

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County:** San Bernardino **and** (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad:** *Mt. Baldy, CA* **Date:** **T** 1N; **R** 7W; unsectioned land, S.B.**B.M.**

c. Address: **City:** Upland, CA **Zip:**

d. UTM: Zone: 11; mE/ mN (G.P.S.)

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate): APN 1044-091-22; southeast corner of East 20th Street and Flower Court, north of Route 210.

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

The water reservoir is located in the northwestern part of the property. It is round and approximately 130 feet in diameter. Depending on the terrain, approximately 2 to 3 feet of the reservoir, including the roof, are above grade. The reservoir wall is concrete. There is a wood truss system mounted on top of the wall to support the roof. The conical roof has a very slight pitch, is sheathed with composition sheets, extends slightly beyond the reservoir walls, and has a center-mounted monitor. There is a large, in-ground, elbow pipe that enters the reservoir on the west side. There is also a board-formed concrete box on the northwest side of the reservoir. Equipment is attached to the northeast side of the reservoir. The reservoir appears to be in fair condition.

The property also includes a modern metal building, a metal cargo container, a concrete slab with metal cabinets, large pipes, various equipment, and piles of rubble. A solid wall surrounds the property and screens it from view from the public right-of-way. Aside from the water reservoir, all of the built environment features on the property are modern. The setting consists of modern single-family residences to the north and west, Route 210 to the south, and undeveloped land to the east and northeast.

***P3b. Resource Attributes:** (Original uses) HP22-Reservoir

***P4. Resources Present:** ☒Building ☐Structure ☐Object ☐Site ☐District ☐Element of District ☐Other (Isolates, etc.)

P5a. Photo or Drawing (Photo required for buildings, structures, and objects.)

P5b. Description of Photo: (View, date, accession #) Reservoir #1, view east (8/6/24)

***P6. Date Constructed/Age and Sources:** ☒Historic ☐Prehistoric ☐Both
1930 (*The Daily Report* 1928 and 1930)

***P7. Owner and Address:**
San Antonio Water Company
139 North Euclid Avenue
Upland, CA 91786

***P8. Recorded by:** (Name, affiliation, and address)
Casey Tibbet, M.A.
LSA Associates, Inc.
1500 Iowa Avenue, Suite 200
Riverside, CA 92507

***P9. Date Recorded:**
August 6, 2024

***P10. Survey Type:** (Describe) Intensive-level CEQA compliance

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") Cultural Resources Assessment, San Antonio Water Company Headquarters, City of Upland, San Bernardino County, California. Prepared by LSA Associates, Inc. in 2024.

***Attachments:** ☐NONE ☒Location Map ☐Sketch Map ☒Continuation Sheet ☒Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

BUILDING, STRUCTURE, AND OBJECT RECORD

*NRHP Status Code 6Z

*Resource Name or # (Assigned by recorder) Reservoir #1

B1. Historic Name:
B2. Common Name:
B3. Original Use: Reservoir **B4. Present Use:** Reservoir
***B5. Architectural Style:** Utilitarian
***B6. Construction History:** (Construction date, alterations, and date of alterations)

No original permits or plans for this reservoir were found. According to the San Antonio Water Company, it was built in the 1930s (San Antonio Water Company 2024). A search of news articles found that in summer 1928, the San Antonio Water Company adopted a recommendation that "a reservoir to equalize the flow and prevent fluctuation of the heads, [should] be constructed on the Nineteenth street well pipe line just west of Campus avenue and Twentieth street [location of subject property] and that booster pumps [should] be installed there and a steel booster line constructed from that point north to Twenty-second street and west thereon to San Antonio avenue. This would permit boosting water to the upper section in periods of shortage or if the East Twenty-third street pump should break down. Estimated cost, $44,530" (*The Daily Report* 1928). Although no news articles regarding the construction process or its completion were found, 1930 advertisements related to Schulhof ranch reference the "new reservoir" east of Euclid Avenue and north of 19th Street (*The Daily Report* 1930). The Schulhof ranch residence was located on the northwest corner of 20th and Sapphire Streets (now Flower Court). The reservoir first appears on topographic maps dated 1933 and is clearly visible in aerial photographs from 1938 (Historicaerials.com var.).

***B7. Moved?** ☒No ☐Yes ☐Unknown **Date:** **Original Location:**
***B8. Related Features:** A modern metal building, a metal cargo container, a concrete slab with metal cabinets, large pipes, and various equipment.

B9a. Architect: None found **b. Builder:** San Antonio Water Company
***B10. Significance: Theme:** **Area:**
Period of Significance: **Property Type:** **Applicable Criteria:** NA
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

This 1930 concrete reservoir does not meet the criteria for listing in the California Register of Historical Resources (California Register) or designation under the City of Upland Cultural Resources ordinance. It is not a "historical resource" for purposes of the California Environmental Quality Act (CEQA). (*See Continuation Sheet*)

Historic Context. Refer to the related report (see P11 on page 1).

B11. Additional Resource Attributes: (List attributes and codes)

***B12. References:**

Historicaerials.com
Var. Historic aerial photographs and historic topographic maps of the project area and vicinity. Various years reviewed. Accessed online in September 2024 at: https://www.historicaerials.com/viewer.

San Antonio Water Company
2024 Personal communication via email with Brian C. Lee, General Manager/CEO, San Antonio Water Company on September 9.

The Daily Report
1928 Stockholders of Concern Approve $215,000 Project. August 1, page 3.

1930 For sale advertisement. August 13, page 8.

B13. Remarks:

***B14. Evaluator:** Casey Tibbet, M.A., LSA Associates, Inc., 1500 Iowa Avenue, Suite 200, Riverside, CA 92507

(This space reserved for official comments.)

(Sketch Map with north arrow required.)

Refer to Location Map

***Date of Evaluation:** September 2024

***B10. Significance** (continued from page 2)
This resource is being evaluated under the criteria for listing in the California Register and designation as a City of Upland Cultural Resource (Chapter 17.26.100(F) of the City's Municipal Code). Many of the City's criteria for designation are similar to those of the California Register. Where appropriate, these have been grouped together to avoid redundancy.

California Register Criterion 1: It is associated with the events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.

City Criterion 3: It is identified with historic persons or with important events in local, state, or national history.
This reservoir is associated with the San Antonio Water Company, which was incorporated in 1882 and developed a water system that played a critical role in the early settlement and development of Upland and neighboring Ontario. However, this reservoir, which was built in 1930, nearly 50 years after the company incorporated, did not contribute to the early success of the community. It is one of many facilities built by the company over several decades to support the continued growth of the area. No indication was found that it made any important contributions to local history or development. It is not significant under these criteria.

California Register Criterion 2: It is associated with the lives of persons important to local, California, or national history.

City Criterion 3: It is identified with historic persons or with important events in local, state, or national history.
No evidence was found that this reservoir is associated with historically significant people. It is not significant under these criteria.

California Register Criterion 3: It embodies the distinctive characteristics of a type, period, region, or method or construction, or represents the work of a master, or possesses high artistic values.

City Criterion 4: It is representative of the work or product of a notable builder, designer, or architect.
The reservoir is identifiable as an early 20th century reservoir based on its construction materials (poured-in-place concrete and wood truss roof supports). However, those materials and the related methods of construction are common for the period and region. No evidence was found that the reservoir is the work of a master engineer or builder, and it does not possess high artistic values. It is not significant under these criteria.

California Register Criterion 4: It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the Nation.

City Criterion 1: It embodies distinguishing architectural characteristics, valuable to the study of a period, style, method of construction, or the use of indigenous materials or craftsmanship.
The reservoir was built in 1930 using common methods and materials and is not valuable to the study of a period, style, or method of construction, or the use of indigenous materials or craftsmanship. It does not have the potential to yield information important to the prehistory or history of the area. It is not significant under these criteria.

The following addresses the remaining City criteria for designation.

City Criterion 2: It exemplifies, symbolizes, or manifests elements of the cultural, social, economic, political, or architectural history of the city.
The reservoir is one element of the San Antonio Water Company water system that played an important role in the development of the Ontario and Upland communities in the late 1800s and early 1900s. As a relatively late piece of infrastructure (1930), this reservoir is not associated with the early settlement of those communities and did not play a role in the development or success of the citrus industry. It does not exemplify or symbolize that system and is not significant under this criterion.

City Criterion 5: Its unique location or singular physical characteristics represent an established and familiar visual feature of a neighborhood.
The reservoir has existed in this location for nearly 100 years. However, there is nothing unique about its location and it does not have unusual physical characteristics that cause it to stand out. Furthermore, because it is mostly subterranean it has never been particularly visible from beyond its immediate surroundings. For these reasons, despite its long history in this location, it is not a familiar visual feature. It is not significant under this criterion.

See Continuation Sheet

***B10. Significance** (continued from page 3)

City Criterion 6: It contributes to the continuity or character of a visually or thematically cohesive street, neighborhood, or area.
The reservoir was constructed in 1930, when the surrounding area was developed with citrus groves. Today, the area is developed with modern homes that have no relationship to the agricultural past of the area or the reservoir. It is not significant under this criterion.

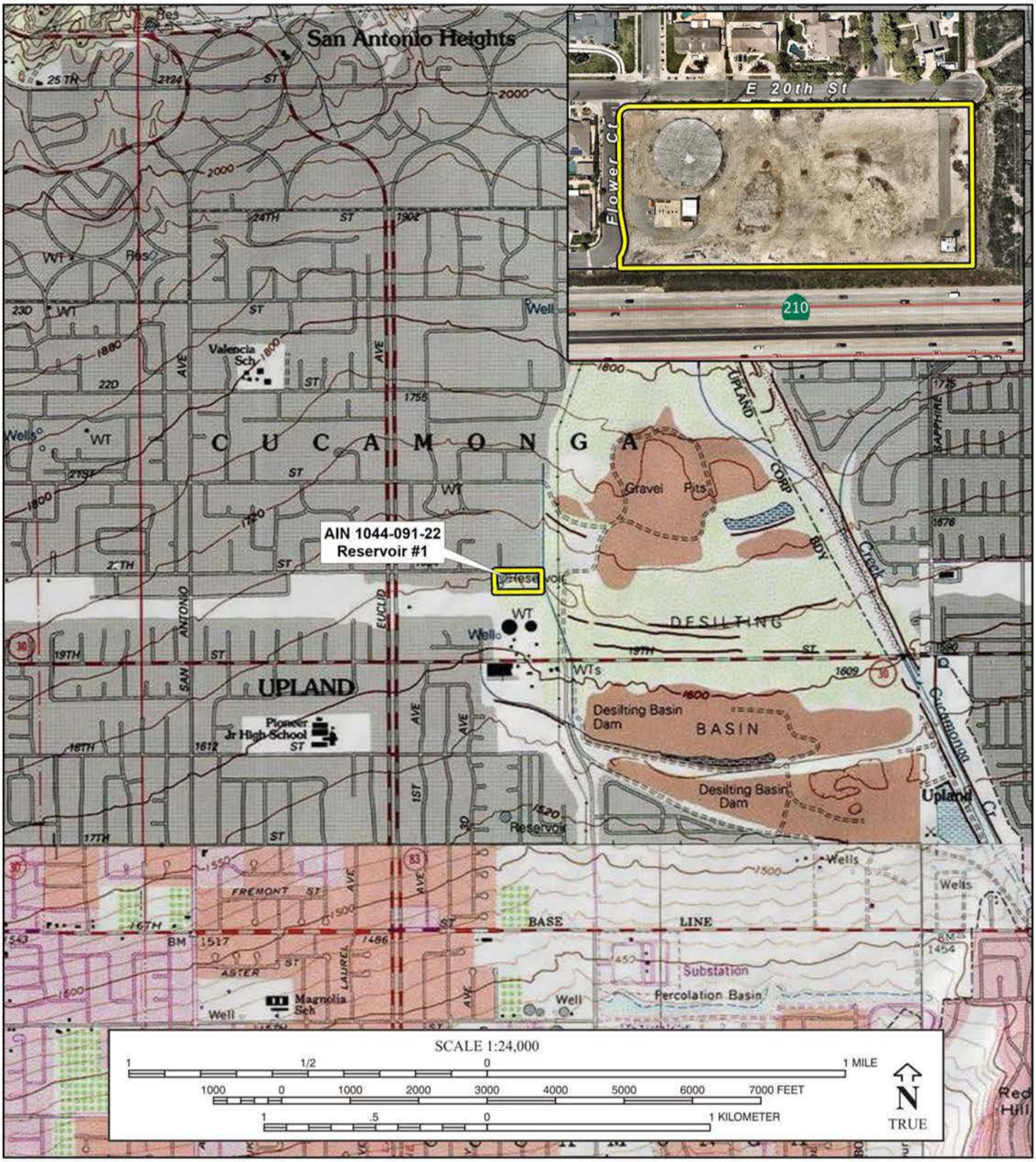
City Criterion 7: It has integrity as a natural or manmade environment that strongly contributes to the well-being of the people of the community.
The reservoir is part of the manmade environment. Originally, it contributed to the irrigation system that supported nearby citrus groves. Today, it supports the quarry located to the northeast. It is not strongly connected to the well-being of the people in the community. It is not significant under this criterion.

State of California - Resource Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary # 36-020141
HRI #
Trinomial

*Resource Name or Reservoir #1

*Map Name: USGS 7.5' Quad, Mt. Baldy; Nearmap *Scale: 1:24000 *Date of Map: 1988; 2024



I:\2024\20241723\GIS\Pro\San Antonio Water Company Headquarters\San Antonio Water Company Headquarters.aprx (8/23/2024)

*Required Information

~~P1082-21H~~
P36-020141

CALIFORNIA DEPARTMENT OF TRANSPORTATION
ARCHITECTURAL INVENTORY/EVALUATION FORM

MAP REFERENCE NO. 31

County - Route - Postmile: SBd-30 0.0/22.8

( ) LISTED ( ) DETERMINED ELIGIBLE
( ) APPEARS ELIGIBLE (xx) APPEARS INELIGIBLE

PART OF SBR-6255H/P36-006255

IDENTIFICATION

1.Common Name: Reservoir

2.Historic Name: Unknown

3.Street or rural address: South side of 20th Street, east of Euclid Avenue

City: Upland **Zip Code:** 91786 **County:** San Bernardino

4.Parcel Number: 1044-091-01 **Present Owner:** San Antonio Water Company

Address: P. O. Box 877 **City:** Upland **Zip Code:** 91786

5.Ownership is: ( ) Public (x) Private

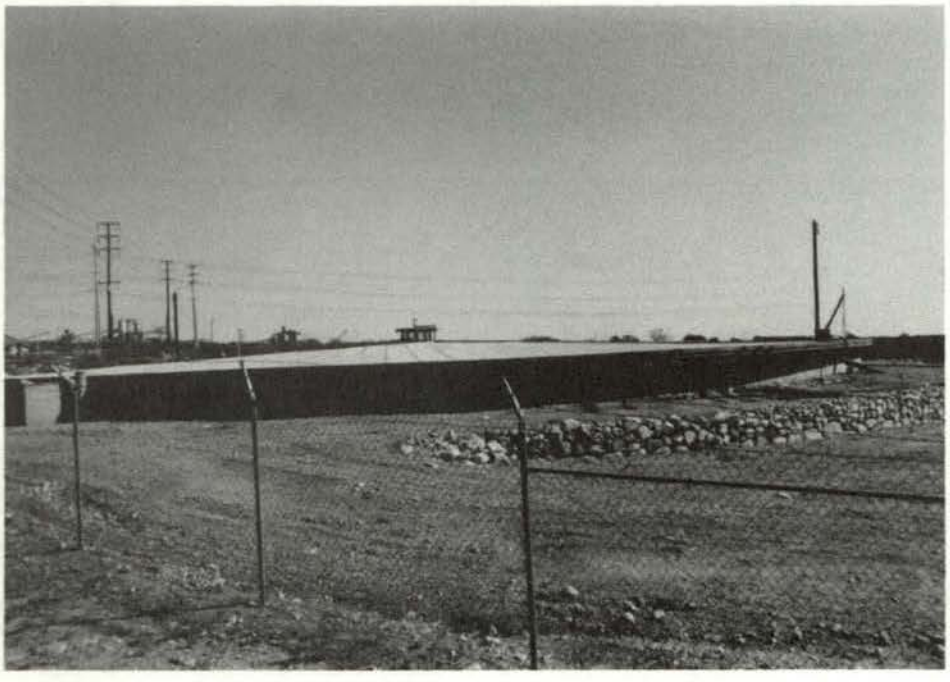
6.Present Use: Reservoir **Original Use:** Reservoir

DESCRIPTION

7a.Architectural Style: n/a

7b.Briefly describe the present PHYSICAL CONDITION of the site or structure and describe any major alterations from its original condition:

This large, circular reservoir is covered by a low pitched conical roof with a monitor in the center. The reservoir is concrete. The roof is supported on evenly spaced 2x4s with occasional diagonal braces between them, providing a one foot air space between the reservoir and the roof. The roof surface is rolled composition. There is a dry laid cobblestone retaining wall on the southwest perimeter of the reservoir. Below the retaining wall on the south is a concrete settling tank. Immediately to the southwest of the tank is a corrugated metal pumping plant, with a cross gable roof, on which is inscribed "S.A.W. Co. B.1" (San Antonio Water Company). The property is surrounded by a chain link fence.



8. **Construction date**
   Estimated: (1930) **Factual:** ( )
9. **Architect:** Unknown
10. **Builder:** Unknown
11. **Approx. property size (in feet)**
    Frontage: 695' **Depth:** 627'
12. **Date(s) of enclosed photograph(s):**
    November 1988

P36-020141

13.Condition: Excellent (x) Good ( ) Fair ( ) Deteriorated ( )

14.Alterations: As noted in item 7b.

15.Surroundings: (Check more than one if necessary) Open land (x) Scattered buildings ( ) Densely built-up ( ) Residential (x) Industrial ( ) Commercial ( ) Other:

16.Threats to site: None known ( ) Private Development ( ) Zoning ( ) Vandalism ( ) Public Works Project (x)

17.Is the structure: On its original site? (x) Moved? ( ) Unknown? ( )

18.Related features: As noted in item 7b.

SIGNIFICANCE

19.Briefly state historical and/or architectural importance (include dates, events, and persons associated with the site):

An aerial photo from 1930 shows this reservior newly built with the land around it scarred by the construction. Subsequent photos show vegetation returning. The reservoir and corrugated metal pumping plant belongs to the San Antonio Water Company; it still supplies irrigation water to the few remaining citrus groves in the immediate vicinity. This is one of many such facilities built throughout the local area. It does not appear to have made significant individual contributions to local history and development, and does not appear to meet the eligibility criteria of the National Register.

Location sketch map (draw & label site and surrounding streets, roads, and prominent landmarks): See Map 3.

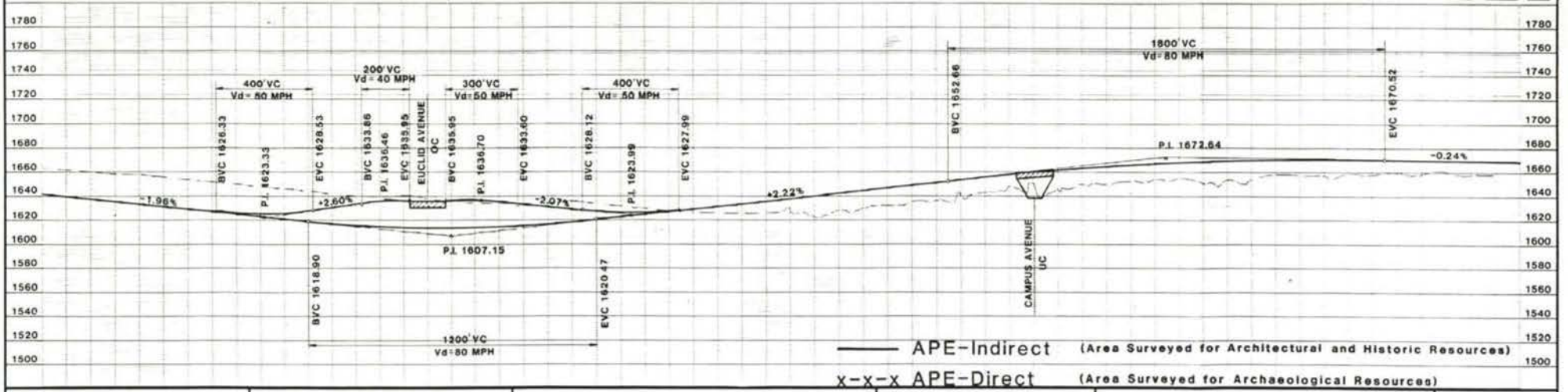
20.Main theme of the historic resource: (If more than one is checked, number in order of importance.)

Architecture ( ) Arts & Leisure ( )
Economic/Industrial ( ) Exploration/Settlement ( )
Government ( ) Military ( ) Religion ( )
Social/Education ( )

21.Sources (List books, documents, surveys, personal interviews and their dates.)

Fairchild Aerial Photo Collection, Whittier College (Photos C829-19/20, 1930; 4061-39, 1936, C5042-25/6, 1938; 13990 3-54, 1949); San Bernardino County Assessor, Map 1044

22.Date form prepared: December 14, 1988
By: Bonnie Parks, Aaron Gallup
Organization: Caltrans
Address: 1120 N Street
City: Sacramento **Zip Code:** 95814
Phone: (916) 920-7680



—— APE-Indirect (Area Surveyed for Architectural and Historic Resources)

x-x-x APE-Direct (Area Surveyed for Archaeological Resources)

Parsons Brinckerhoff

Parsons Brinckerhoff Quade & Douglas
Engineers Architects Planners
Orange Commerce Center 505 South Main Street Suite 410
Orange CA 92668 714-971-4660

Caltrans

ROUTE 30
ALTERNATIVE ANALYSIS/
ENVIRONMENTAL ASSESSMENT

SCALE
HORIZ. 200 0 200 400
VERT. 40 0 40 80

ROUTE 30 FREEWAY ALTERNATIVE
CITY OF
UPLAND

FIGURE
10 OF 27

P36-020141 PART OF SBR-6255A
#31 ON MAP

APPENDIX B

RECORDS SEARCH RESULTS

Report List

LSA2412

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SB-01595	NADB-R - 1061595; Voided - 86-10.3	1986	BISSELL, RONALD M.	CULTURAL RESOURCES ASSESSMENT OF PROPOSED CONSTRUCTION OF CAMPUS AVENUE BETWEEN 19TH STREET AND 22ND STREET, CITY OF UPLAND, SAN BERNARDINO COUNTY, CALIFORNIA		
SB-01601	NADB-R - 1061601; Voided - 86-11.5	1986	HATHEWAY, ROGER G. and ROGER D. MASON	HISTORIC PROPERTY SURVEY REPORT: EUCLID AVENUE IMPROVEMENT PROJECT, CITY OF UPLAND, CALIFORNIA, PROJECT 3645	SCIENTIFIC RESOURCE SURVEYS	
SB-01660	NADB-R - 1061660; Voided - 87-3.14	1987	GROSS, LORRAINE S., KEVIN J. PETER, and WILLIAM B. GILMOUR	CULTURAL AND PALEONTOLOGICAL RESOURCE INVESTIGATIONS OF THE LAKES AT SAN ANTONIO PROJECT, CITY OF UPLAND, SAN BERNARDINO COUNTY, CALIFORNIA	SCIENTIFIC RESOURCE SURVEYS	
SB-02530	NADB-R - 1062530; Voided - 89-3.12	1989	GALLUP, AARON A., BONNIE W. PARKS, DENISE O'CONNOR, and STEPHEN D. MIKESELL	HISTORICAL ARCHITECTURAL SURVEY REPORT AND HISTORIC RESOURCE EVALUATION REPORT FOR A PROPOSED HIGHWAY ON NEW ALIGNMENT	HARVEY SAWYER	36-016474
SB-03568	NADB-R - 1063568	1979	KING, L.D.	EUCLID AVE. TRAFFIC IMPROVEMENT PROJECT M-5083 INFORMATIONAL REPORT ON EFFECTS SEC 106-HISTORIC PRESERVATION ACT. 75PP		36-002910, 36-018222, 36-018593, 36-018594, 36-018596, 36-018598, 36-018600, 36-018602, 36-018603, 36-018604
SB-03781	NADB-R - 1063781	2000	DUKE, CURT	CULTURAL RESOURCE ASSESSMENT FOR AT&T WIRELESS SERVICES FACILITY C960.1, COUNTY OF SAN BERNARDINO, CA. 4PP	LSA	36-006255
SB-03782	NADB-R - 1063782	2002	DUKE, CURT	CULTURAL RESOURCE ASSESSMENT: AT&T WIRELESS SERVICES FACILITY C960A, SAN BERNARDINO COUNTY, CA. 7PP	LSA	36-006255
SB-05800	NADB-R - 1065800	2007	Bonner, Wayne H. and Marnie Aislin-Kay	Cultural Resource Record Search and Site Visit for Royal Street Communications, LLC Candidate LA22154A (SCE Campus & 20th) Southwest Corner of the Intersection at Campus Street and 24th Street, Upland, San Bernardino County, California.		
SB-05801	NADB-R - 1065801	2007	Eddy, John J. and Daniel Ballester	Historical/Archaeological Resources Survey Report: Proposed Zone III Reservoir, City of Upland, San Bernardino County, California.		

Report List

LSA2412

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SB-06624	NADB-R - 1066624	2009	Wlodarski, Robert J.	Record Search and Field Reconnaissance Phase for the Proposed AT&T Wireless Communications Site LAC960 (Euclid Highway 30) located at 1933 Campus Drive, Upland, California.		
SB-07873	NADB-R - 1067873	2014	Wills, Carrie D. and Kathleen A. Crawford	Cultural Resource Records Search and Site Visit Results for Verizon Wireless Candidate 'Winston', East 20th Street, Upland, San Bernardino County, California.	First Carbon Soluitions	

APPENDIX C

NATIVE AMERICAN CONSULTATION ASSISTANCE

NATIVE AMERICAN HERITAGE COMMISSION

CHAIRPERSON
Reginald Pagaling
Chumash

VICE-CHAIRPERSON
Buffy McQuillen
Yokayo Pomo, Yuki, Nomlaki

SECRETARY
Sara Dutschke
Miwok

PARLIAMENTARIAN
Wayne Nelson
Luiseño

COMMISSIONER
Isaac Bojorquez
Ohlone-Costanoan

COMMISSIONER
Stanley Rodriguez
Kumeyaay

COMMISSIONER
Laurena Bolden
Serrano

COMMISSIONER
Reid Milanovich
Cahuilla

COMMISSIONER
Bennae Calac
Pauma-Yuima Band of Luiseño Indians

EXECUTIVE SECRETARY
Raymond C. Hitchcock
Miwok, Nisenan

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

July 8, 2024

Jaimi Starr
LSA Associates, Inc.

Via Email to: Jaimi.Starr@lsa.net

Re: San Antonio Water Co. Headquarters & Driveway (20241723) Project, San Bernardino County

To Whom It May Concern:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information submitted for the above referenced project. The results were positive. Please contact the Gabrieleno Band of Mission Indians - Kizh Nation on the attached list for information. Please note that tribes do not always record their sacred sites in the SLF, nor are they required to do so. A SLF search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with a project's geographic area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites, such as the appropriate regional California Historical Research Information System (CHRIS) archaeological Information Center for the presence of recorded archaeological sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. Please contact all of those listed; if they cannot supply information, they may recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify the NAHC. With your assistance, we can assure that our lists contain current information.

If you have any questions or need additional information, please contact me at my email address: Murphy.Donahue@NAHC.ca.gov

Sincerely,

Murphy Donahue

Murphy Donahue
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Native American Contact List
San Bernardino County
7/8/2024

County	Tribe Name	Fed (F) Non-Fed (N)	Contact Person	Contact Address	Phone #	Fax #	Email Address	Cultural Affiliation	Counties	Last Updated
San Bernardino	Agua Caliente Band of Cahuilla Indians	F	Lacy Padilla, Director of Historic Preservation/THPO	5401 Dinah Shore Drive Palm Springs, CA, 92264	(760) 333-5222	(760) 699-6919	ACBCI-THPO@aguacaliente.net	Cahuilla	Imperial,Riverside,San Bernardino,San Diego	1/11/2024
	Cahuilla Band of Indians	F	Erica Schenk, Chairperson	52701 CA Highway 371 Anza, CA, 92539	(951) 590-0942	(951) 763-2808	chair@cahuilla-nsn.gov	Cahuilla	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego	2/1/2024
	Cahuilla Band of Indians	F	Anthony Madrigal, Tribal Historic Preservation Officer	52701 CA Highway 371 Anza, CA, 92539	(951) 763-5549		anthonymad2002@gmail.com	Cahuilla	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego	6/28/2023
	Cahuilla Band of Indians	F	BobbyRay Esparza, Cultural Director	52701 CA Highway 371 Anza, CA, 92539	(951) 763-5549		besparza@cahuilla-nsn.gov	Cahuilla	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego	6/28/2023
	Gabrieleno Band of Mission Indians - Kizh Nation	N	Andrew Salas, Chairperson	P.O. Box 393 Covina, CA, 91723	(844) 390-0787		admin@gabrielenoindians.org	Gabrieleno	Los Angeles,Orange,Riverside,San Bernardino,Santa Barbara,Ventura	8/18/2023
	Gabrieleno Band of Mission Indians - Kizh Nation	N	Christina Swindall Martinez, Secretary	P.O. Box 393 Covina, CA, 91723	(844) 390-0787		admin@gabrielenoindians.org	Gabrieleno	Los Angeles,Orange,Riverside,San Bernardino,Santa Barbara,Ventura	8/18/2023
	Gabrieleno/Tongva San Gabriel Band of Mission Indians	N	Anthony Morales, Chairperson	P.O. Box 693 San Gabriel, CA, 91778	(626) 483-3564	(626) 286-1262	GTTribalcouncil@aol.com	Gabrieleno	Los Angeles,Orange,Riverside,San Bernardino,Santa Barbara,Ventura	12/4/2023
	Gabrielino Tongva Indians of California Tribal Council	N	Robert Dorame, Chairperson	P.O. Box 490 Bellflower, CA, 90707	(562) 761-6417	(562) 761-6417	gtongva@gmail.com	Gabrielino	Los Angeles,Orange,Riverside,San Bernardino,Santa Barbara,Ventura	3/16/2023
	Gabrielino Tongva Indians of California Tribal Council	N	Christina Conley, Cultural Resource Administrator	P.O. Box 941078 Simi Valley, CA, 93094	(626) 407-8761		christina.marsden@alumni.usc.edu	Gabrielino	Los Angeles,Orange,Riverside,San Bernardino,Santa Barbara,Ventura	3/16/2023
	Gabrielino/Tongva Nation	N	Sandonne Goad, Chairperson	106 1/2 Judge John Aiso St., #231 Los Angeles, CA, 90012	(951) 807-0479		sgoad@gabrielino-tongva.com	Gabrielino	Los Angeles,Orange,Riverside,San Bernardino,Santa Barbara,Ventura	3/28/2023
	Gabrielino-Tongva Tribe	N	Sam Dunlap, Cultural Resource Director	P.O. Box 3919 Seal Beach, CA, 90740	(909) 262-9351		tongvatcr@gmail.com	Gabrielino	Los Angeles,Orange,Riverside,San Bernardino,Santa Barbara,Ventura	5/30/2023
	Gabrielino-Tongva Tribe	N	Charles Alvarez, Chairperson	23454 Vanowen Street West Hills, CA, 91307	(310) 403-6048		Chavez1956metro@gmail.com	Gabrielino	Los Angeles,Orange,Riverside,San Bernardino,Santa Barbara,Ventura	5/30/2023
	Morongo Band of Mission Indians	F	Ann Brierty, THPO	12700 Pumarra Road Banning, CA, 92220	(951) 755-5259	(951) 572-6004	abrierty@morongo-nsn.gov	Cahuilla Serrano	Imperial,Kern,Los Angeles,Riverside,San Bernardino,San Diego	
	Morongo Band of Mission Indians	F	Robert Martin, Chairperson	12700 Pumarra Road Banning, CA, 92220	(951) 755-5110	(951) 755-5177	abrierty@morongo-nsn.gov	Cahuilla Serrano	Imperial,Kern,Los Angeles,Riverside,San Bernardino,San Diego	
	Quechan Tribe of the Fort Yuma Reservation	F	Manfred Scott, Acting Chairman Kw'ts'an Cultural Committee	P.O. Box 1899 Yuma, AZ, 85366	(928) 210-8739		culturalcommittee@quechantribe.com	Quechan	Imperial,Kern,Los Angeles,Riverside,San Bernardino,San Diego	5/16/2023
	Quechan Tribe of the Fort Yuma Reservation	F	Jill McCormick, Historic Preservation Officer	P.O. Box 1899 Yuma, AZ, 85366	(928) 261-0254		historicpreservation@quechantribe.com	Quechan	Imperial,Kern,Los Angeles,Riverside,San Bernardino,San Diego	5/16/2023
	Quechan Tribe of the Fort Yuma Reservation	F	Jordan Joaquin, President, Quechan Tribal Council	P.O.Box 1899 Yuma, AZ, 85366	(760) 919-3600		executivesecretary@quechantribe.com	Quechan	Imperial,Kern,Los Angeles,Riverside,San Bernardino,San Diego	5/16/2023
	San Manuel Band of Mission Indians	F	Alexandra McCleary, Senior Manager of Cultural Resources Managemen	26569 Community Center Drive Highland, CA, 92346	(909) 633-0054		alexandra.mccleary@sanmanuel-nsn.gov	Serrano	Kern,Los Angeles,Riverside,San Bernardino	1/16/2024
	Santa Rosa Band of Cahuilla Indians	F	Vanessa Minott, Tribal Administrator	P.O. Box 391820 Anza, CA, 92539	(951) 659-2700	(951) 659-2228	vminott@santarosa-nsn.gov	Cahuilla	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego	4/8/2024
	Santa Rosa Band of Cahuilla Indians	F	Steven Estrada, Tribal Chairman	P.O. Box 391820 Anza, CA, 92539	(951) 659-2700	(951) 659-2228	sestrada@santarosa-nsn.gov	Cahuilla	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego	4/8/2024
	Serrano Nation of Mission Indians	N	Wayne Walker, Co-Chairperson	P. O. Box 343 Patton, CA, 92369	(253) 370-0167		serranonation1@gmail.com	Serrano	Kern,Los Angeles,Riverside,San Bernardino	10/10/2023
	Serrano Nation of Mission Indians	N	Mark Cochrane, Co-Chairperson	P. O. Box 343 Patton, CA, 92369	(909) 578-2598		serranonation1@gmail.com	Serrano	Kern,Los Angeles,Riverside,San Bernardino	10/10/2023
	Soboba Band of Luiseno Indians	F	Jessica Valdez, Cultural Resource Specialist	P.O. Box 487 San Jacinto, CA, 92581	(951) 663-6261	(951) 654-4198	jvaldez@soboba-nsn.gov	Cahuilla Luiseno	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego	7/14/2023
	Soboba Band of Luiseno Indians	F	Isaiah Vivanco, Chairperson	P.O. Box 487 San Jacinto, CA, 92581	(951) 654-5544	(951) 654-4198	ivivanco@soboba-nsn.com	Cahuilla Luiseno	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego	7/14/2023
	Soboba Band of Luiseno Indians	F	Joseph Ontiveros, Tribal Historic Preservation Officer	P.O. Box 487 San Jacinto, CA, 92581	(951) 663-5279	(951) 654-4198	jontiveros@soboba-nsn.gov	Cahuilla Luiseno	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego	7/14/2023

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed San Antonio Water Co. Headquarters & Driveway (20241723) Project, San Bernardino County.

Record: PROJ-2024-003374
Report Type: List of Tribes
Counties: San Bernardino
NAHC Group: All

City of Upland
AB52 Tribal Consultation Notification

Gabrieleno Band of Mission Indians - Kizh Nation
Andrew Salas, Chairperson
P.O. Box 393
Covina, California 91723
admin@gabrielenoindians.org

Gabrieleno/Tongva San Gabriel Band of Mission Indians
Anthony Morales, Chairperson
P.O. Box 693
San Gabriel, California 91778
GTTribalcouncil@aol.com

Yuhaaviatam of San Manuel Nation
Alexandra McCleary, Cultural Lands Manager
26569 Community Center
Highland, California 92346
alexandra.mccleary@sanmanuel-nsn.gov

Torres Martinez Desert Cahuilla Indians
Michael Mirelez, Cultural Resources Coordinator
Abraham Becerra, Cultural Coordinator
P.O. Box 1160
Thermal, CA 92274
abecerra@tmdci.org

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APPENDIX D

REPORT OF GEOTECHNICAL EVALUATIONS

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SOILS SOUTHWEST, INC.
SOILS, MATERIALS AND ENVIRONMENTAL ENGINEERING CONSULTANTS

897 VIA LATA, SUITE N • COLTON, CA 92324 • (909) 370-0474 • (909) 370-0481 • FAX (909) 370-3156

Report of Geotechnical Evaluations and Soils Infiltration Testing for WQMP-BMP Stormwater Disposal Design

Planned New San Antonio Water District Headquarters Office and Maintenance Facility
400 E. 20th Street
Upland, CA
APN: 1044-091-22

Project No. 24036-F/BMP

August 28, 2024

Prepared for:

CEDG, Inc.
c/o Mr. Erik Peterson
401 E. Columbia Avenue
Pomona, CA 91767

soilssouthwest@aol.com
Established 1984

SOILS SOUTHWEST, INC.

SOILS, MATERIALS AND ENVIRONMENTAL ENGINEERING CONSULTANTS

897 VIA LATA, SUITE N • COLTON, CA 92324 • (909) 370-0474 • (909) 370-0481 • FAX (909) 370-3156

August 28, 2024 Project No.24001-F/BMP

CEDG, Inc.
401 E. Columbia Avenue
Pomona, CA 91767

Attention: Mr. Erik Peterson

Subject: Report of Geotechnical Evaluations and
Soils Infiltration Rates for WQMP-BMP Stormwater Disposal Design
Planned New San Antonio Water District Headquarters Office and Maintenance Facility
400 E. 20th Street
Upland, CA
APN: 1044-091-22

Reference: Preliminary Site Plan Provided by Addressee

Dear Mr. Peterson,

Presented herewith is the report of (i) Geotechnical Evaluations and (ii) Soils Infiltration Rates for WQMP-BMP Stormwater Disposal Design proposed for the planned new administrative office and maintenance structures, parking, along with shallow depth basin and underground infiltration disposal systems to be located 400 East 20th Street, Upland, California. In absence of detailed development plans review, the opinions and recommendations included should be considered as "preliminary". Revised and/or updated recommendations may be warranted following precise grading and development plans review.

Based on the referenced site plan, it is understood that the subject development will primarily include two new near grade structures including one maintenance shop and one administrative office structure. Construction of wood and stucco, concrete tilt-up or concrete framed, or concrete block construction with concrete slabs-on-grade is assumed. Supplemental construction is to include on-site driveways and parking and paving for auto/heavy-duty truck traffic , along with the installation of a couple WQMP-BMP stormwater disposal systems to complete the project. Moderate site preparations and grading should be expected. For estimation purposes, the anticipated structural loadings of 80 kips and 8 klf are assumed for isolated column and conventional wall spread foundations, respectively.

Based on the test explorations and laboratory testing completed at this time, it is our opinion that the soils encountered primarily consist of upper 3 feet of variegating layers of gravels and silty fine to medium coarse gravel sand mixtures with high concentrations of rocks, cobbles, and occasional small boulders to the refusal depth of 3 feet explored. Descriptions of the soils encountered are provided in the attached Log of Borings.

No shallow-depth groundwater or impermeable layers were encountered. Historical and shallow-depth groundwater is reported at approximately 267 feet below grade as measured at the nearest water well, 01N07W28N002S. Based on such, and as described in the Special Publication SP117, published by the State of California Department of Conservation, Division of Mines and Geology, it is our opinion that the site is considered non-susceptible to seismically induced soils liquefaction thereby requiring no special geotechnical design recommendations other than those as recommended herein.

Based on review of the available USGS (California Geologic Survey) publication, it is understood that the site is not situated within an A-P Special Studies Zone where a known seismic fault passes through the site or its adjacent. Supplemental information is provided in Appendix C.

Following review of the online FEMA National Flood Hazard Layer Mapping, it is understood that the project site is classified as a Zone X, Area of Minimal Flood Hazard.

Based on the evaluations completed at this time, it is our opinion that from a geotechnical viewpoint, the site should be considered suitable for the proposed development provided that the recommendations and opinions included are considered in design and construction.

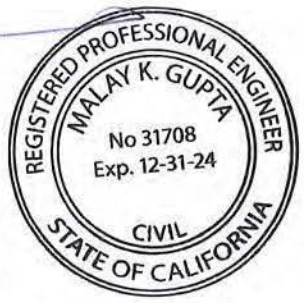
Final grading and detailed development plan review is suggested to verify the applicability of the certain assumptions as used in preparing this report.

This report has been substantiated by subsurface explorations and mathematical analysis made in accordance with the generally accepted engineering principles, including those field and laboratory testing considered necessary in the circumstances.

We offer no other warranty, expressed or implied.

Respectfully submitted,
Soils Southwest, Inc.

Malay Gupta, RCE 31708



John Flippin
Project Coordinator

1.0 Introduction

1.1 Purpose and Scope of Work

This report presents the results of (i) Geotechnical Evaluations and (ii) Soils Infiltration Testing for WQMP-BMP Stormwater Disposal System Design for the new administrative office and maintenance structures, parking, along with shallow depth and underground infiltration design systems to be located 400 East 20th Street, Upland, California. In absence of precise grading and/or detailed development plans, the recommendations and opinions included may require updating and revisions recommendations following detailed development plans review.

The soils encountered as described herein are based on visual observations made during test explorations, supplemented by the necessary laboratory testing completed at this time. Being beyond scope of work, no geologic investigations or Phase I Environmental Site Assessment (ESA) are included. Reports of such will be supplied upon request.

The recommendations contained reflect our best estimate of the soils' conditions as encountered during field explorations as conducted for the site. It is not to be considered as a warranty of the soils' conditions for other areas or for the depth beyond the explorations advanced at this time.

The recommendations supplied should be considered valid and applicable following review of the final grading and development plans when supplied and when the following conditions are observed:

i. Pre-grade meeting with the contractor, public agency, and the geotechnical engineer,
ii. Excavated bottom inspections and verifications by the geotechnical engineer prior to backfill placement,
iii. Continuous observations and testing during site preparation and structural fill soils placement,
iv. Observation and inspection of footing trenching prior to steel and concrete placement,
v. Plumbing trenches backfill placement prior to concrete slab-on-grade placement,
vi. On and off-site utility trenches backfill testing and verifications, and
vii. Consultations as required during construction or upon your request.

1.2 Site Description

The rectangular shaped subject parcel of 4.92 acres is currently a water district yard facility in operation . In general, the site is bounded by East 20th Street to the north, by Interstate 210 Freeway on the south, by vacant undeveloped property on the east, and by Flower Court on the west. Following review of the available site drawings, overall vertical relief within the property is unknown, however, based on site reconnaissance, sheet flow from incidental rainfall is estimated to flow towards the south and southwest. Other than an existing reservoir tank, pump station, and numerous soil, rock, and asphalt debris stockpiles in the center portion of the property, along with a satellite tower at the southeast corner, presence of no other significant features were noted.

1.3 Proposed Development

No precise grading and/or detailed development plans are available for review; however, it is understood that the subject development will primarily include two (2) structures near existing grade to accommodate, among others, a maintenance building and an administrative office. Use of wood and stucco framed, concrete block, or metal framed construction with concrete slabs-on-grade is assumed. Supplemental construction is anticipated to include on-site driveways, parking and paving, along with the installation of two (2) WQMP-BMP stormwater disposal systems. Considering existing offsite paving, curb-gutter, and drive approaches, off-site street improvements is not anticipated at this time.

Moderate site preparations and grading are anticipated as described in the following sections.

1.4 Subsurface Investigation

The geotechnical evaluations include subsurface explorations, soil sampling, necessary laboratory testing, engineering analyses, and preparation of this report. Being beyond scope of work, no geologic investigations or Phase I Environmental Site Assessments are included. Reports on such will be supplied on request.

In general, our scope of work included the following: review of the referenced site plan supplied along with three (6) test borings (B-1 to B-6) explored by using a Hollow-Stem Auger (HSA) drill rig advanced to the refusal depth of 3 feet below grade along with four (4) infiltration test borings to maximum depths between 3 and 8 feet (P-1 and P-4) as requested for WQMP-BMP Stormwater Disposal Design. During explorations, the soils encountered were continuously logged, bulked, and undisturbed samples were procured and recorded. Collected samples were subsequently transferred to our laboratory for necessary geotechnical testing.

Descriptions of the soils encountered are provided on the attached Log of Borings. Approximate test locations are shown on the attached Plate A.

- Laboratory testing conducted on the selected bulk and undisturbed samples were programmed according to the project requirements. The laboratory testing included determinations of:
    - Moisture Density Determination (ASTM D2216),
    - Maximum Dry Density and Optimum Moisture Content (ASTM D1557),
    - Soils' Peak and Residual Shear Strengths (ASTM D3080),
    - Soils' Consolidation Characteristics (ASTM D2435),
    - Soils' Sieve Analyses (ASTM D422),
    - Soils' R-value (ASTM D2844), and
    - Soils' Sand Equivalent, SE (ASTM D2419).

- Based on the field investigation and laboratory testing completed the necessary engineering analyses and evaluations were made on which to base our preliminary recommendations for foundation design, slab-on-grade, site preparations and grading, utility trenches backfill, and

- Preparation of this report for initial use by the project design professionals.

The recommendations supplied should be considered "tentative" and may require revisions and/or upgrading following final grading and detailed development plans review.

2.0 Geotechnical Evaluations

2.1 Site Soils Description

The soils encountered primarily consist of upper 3 feet of variegating layers of gravels and silty fine to medium coarse gravel sand mixtures with high concentrations of rocks, cobbles, and occasional small boulders to the refusal depth of 3 feet explored. Descriptions of the soils encountered are provided in the attached Log of Borings.

Based on review of the USDA Natural Resources Conservation Service: Web Soil Survey for the subject area, it is our understanding that the soil classification within the structural pad areas is identified as being SpC-Soboba stony loamy sand, 2 to 9 percent slopes with the upper 60 inches consisting of stony loamy stand and very stony sands below existing grade, whereas the soils within the planned underground infiltration disposal system at the southwest portion of the property being classified as HaC-Hanford coarse sandy loam, 2 to 9 percent slopes consisting of sandy loam and fine sandy loam up to five (5) feet below existing grade. Following review of the Geological Map of the Mount Baldy Quadrangle (2002), the project site is designated as consisting of Qg alluvial gravel and sand of stream channels.

Based on review of the available USGS (California Geologic Survey) publications, it is understood that the site is not situated within an A-P Special Studies Zone where seismic fault passes through the site or its adjacent.

No groundwater or impermeable soils were encountered within the refusal depth of 3 feet explored. According to California Department of Water Resources, the historical groundwater level is at a depth of approximately 267 feet which is in excess of 50 feet below grade as measured at the nearest water well (01N07W28N002S) . Based on such and as described in the Special Publication SP117, published by the State of California Department of Conservation, Division of Mines and Geology, it is our opinion that the site is considered non-susceptible to seismically induced soils liquefaction.

Laboratory shear tests conducted on the upper soils remolded to 90% indicate "moderate" shear strengths under increased moisture conditions. Results of the laboratory shear tests are provided on Plate B.

Consolidation tests conducted on remolded samples indicate "slight" potential for compressibility along with slight to moderate hydro-collapse potential under anticipated static structural loadings with potential for "tolerable" settlements to footings and concrete slabs-on-grade. Areas of slight to moderate compressibility and/or hydro collapsible potential may require further excavation and/or compaction effort. Results of the laboratory determined soils consolidation potential are shown in Appendix B.

Fine to medium coarse to coarse sands with traces of silts along with rocks and cobbles encountered are considered "low" in expansion potential requiring no special construction requirements other than those as recommended herein. Supplemental soil expansion testing, however, is recommended following mass grading completion to provide supplemental/revised foundation recommendations, if warranted.

2.2 Subsurface Variations

During site preparations and grading, buried irrigation, debris, organic and others may be encountered. In addition, variations in soil strata, their continuity and orientations may be expected. Due to the deposition characteristics of the soils encountered, care should be exercised in interpolating or extrapolating the subsurface soils conditions existing in between and beyond the test explorations conducted.

2.3 Excavatibility

It is our opinion that the grading required for the project may be accomplished by using conventional heavy-duty construction equipment. No blasting or jackhammering should be warranted. However, considering the presence of high concentration of cobbles and boulders, it is suggested to use rocks no greater than 6-8 inches in compacted fills, but directly beneath footings and slabs should be avoided.

2.4 Soil Corrosivity

Reference Soil Sample B-1 @ 0-3 feet below grade

1. Chloride concentration equal to 29 mg/Kg does not exceed 10,000 ppm is non-corrosive to ferrous metals,
2. pH equal to 7.93 units exceeding 4.0 units is non-corrosive to buried metals,
3. Sulfate concentration equal to 82 mg/Kg does not exceed 2000 ppm is non-corrosive to concrete, and

4. Resistivity equal to 3,640 ohms/cm is "moderately" corrosive to buried metals.

Soil chemical test results are included in Appendix B.

It is suggested that following mass grading completions, soils corrosivity potential evaluations should be made to determine, at a minimum, concentrations of pH, sulfate, chloride, and resistivity. Further corrective recommendations should be provided by Corrosion Engineer.

2.5 Groundwater

No groundwater or bedrock was encountered within the refusal depth of 3 feet explored. However, following review of the available recorded groundwater well data as shown in the table below, historical groundwater was measured at approximately 267 feet below the existing well grade. The following table describes the historical and the current groundwater level as recorded in the nearest well as listed by the local reporting agency.

GROUNDWATER TABLE	
Reporting Agency	California Department of Water Resources Marcelo Montagna 2008 Maps http://wdl.water.ca.gov/waterdatalibrary/
Well Number	01N/07W-28N002S Cucamonga-1000547
Well Monitoring Agency	Chino Basin
Well Location: Township/Range/Section	T01N-R07W-Section 28
Well Elevation:	1675
Current Depth to Water (Measured in feet)	469
Current Date Water was Measured	March 26,2024
Depth to Water (Measured in feet) (Shallowest)	267
Date Water was Measured (Shallowest)	December 15,1983

Fluctuations in groundwater levels, however, can occur due to seasonal variations in the amount of rainfall, runoff, altered natural drainage paths, and other factors not evident at the time the test borings completed. Accordingly, for the planned development, it is our opinion that provisions should be maintained to dispose incidental surface runoff away from the individual structural pads, once constructed.

3.1 Faulting and Seismicity

Based on the information published by the USGS (currently known as California Geologic Survey) Department of Conservation, State of California, it is understood that the site is not situated within an A-P Special Study Zone where earthquake fault(s) runs through or adjacent to the subject site. In the absence of shallow (less than 50 feet) depth groundwater, the site is considered non-susceptible to soils liquefaction in the event of a strong motion earthquake. However, the site being within Southern California where potentials for seismically induced structural hazards could not be ignored, it is our opinion that implementation of the current CBC seismic design parameters in structural design as described herein may reduce the potential for seismically induced structural distress to some "acceptable" tolerable limits.

Seismically induced site-specific potential hazards are discussed in the following sections.

3.2 Direct or Primary Seismic Hazards

Surface ground rupture along with active fault zones and ground shaking represent primary or direct seismic hazards to structures. There are no known active or potentially active faults that pass through or towards the subject site and the site is not situated within an A-P Special Studies Zone. According to the current 2022 CBC, the site is considered situated within Seismic Zone 4. As a result, it is likely that during the life expectancy of the structures built, moderate to severe ground shaking may have some adverse effects to the structures built.

3.3 Induced or Secondary Seismic Hazards

In addition to ground shaking, effects of seismic activity may include surface rupture, flooding, landsliding, lateral spreading, settlements, and subsidence. Potential effects of such are as described below.

3.3.1 Liquefaction

Liquefaction is caused by build-up of excess hydrostatic pressure in saturated cohesionless soils due to cyclic stress generated by ground shaking during an earthquake. The significant factors on which liquefaction potential of a soil deposit depends, among others include, soil type, relative soil density, intensity of earthquake, duration of ground shaking, and depth of ground water.

No groundwater was encountered within the refusal depth of 3 feet explored. In absence of historically reported groundwater within 50 feet below grade, and based on review the Special Publication SP117, published by the State of California Department of Conservation, Division of Mines and Geology, it is our opinion that the site is considered non-susceptible to seismically induced soils liquefaction thereby requiring no special geotechnical design recommendations other than those as recommended herein.

3.3.2 Shallow Depth Ground Rupture

The site is not situated within an A-P Special Studies Zone. Based on review of the existing geologic information, no major fault is noted to cross through or extend towards the site. The potential for surface rupture resulting from nearby fault movement is not known for certainty; however, in our opinion it is considered "remote" due to the distance of the site to the recorded nearby earthquake fault.

3.3.3 Flooding

Flooding hazards include tsunamis (seismic sea waves), Seiches, or failure of manmade reservoirs, tanks, and aqueducts. The potential for these hazards is considered "remote" considering the inland site location and in absence of nearby known bodies of water. Based on review of the FEMA National Flood Hazard Layer FIRMette map, it is our understanding that the subject area is delineated as Zone X, Area of Minimal Flood Hazard on its eastern half while the western half is delineated as being in an area with "Reduced Flood Risk due to Levee as shown in the attached Appendix C.

3.3.4 Landslides

Seismically induced landslides and other slope failures are common occurrences during or soon after an earthquake. Considering the site and its adjacent being relatively flat, it is our opinion that potential for seismically induced landslides should be considered "remote".

3.3.5 Lateral Spreading

Seismically induced lateral spreading involves lateral movement of soils due to ground shaking. Lateral spreading is demonstrated by near vertical cracks with predominantly horizontal movement of the soil mass involved. The topography of the site being near level, it is our opinion that the potential for seismically induced lateral spreading should be considered "remote".

3.3.6 Seismically Induced Settlement

Considering the proximity of the earthquake fault as described, it is our opinion that potential for some total and differential settlements due to ground shaking may be anticipated as described herein.

3.4 Seismic Design Parameters

The design spectrum was developed based on the 2022 CBC. Site Coordinates of 34.135692°N, -117.645040°W were used to establish the seismic parameters presented below.

3.4.1 Seismic Design Coefficients

The site is situated at approximately 1.3 miles from the Cucamonga Fault capable of generating an earthquake magnitude, M of 6.7 and Peak Horizontal Ground Acceleration, PGA of 0.753g at 10% probability of exceedance in 50-year return period.

For foundation and structural design use of the following seismic parameters are suggested as based on the current 2022 CBC:

Recommended values are based upon the online review of ASCE 7-22 Hazard Tool coefficient parameters. The following presents the seismic design parameters evaluated based on the available publications published by California Geological Survey (CGS), 2022 CBC, and ASCE Standard 7-16.

TABLE 3.4.1 A1: Seismic Design Parameters

Seismic Source Type

Based on California Geological Survey-Probabilistic Seismic Hazard Assessment Peak Horizontal Ground Acceleration (PGA) having a 10% probability of exceedance in a 50-year period is described as below:

Seismic Source Type / Appendix C	
Nearest Maximum Fault Magnitude	M ≥ 6.7
Peak Horizontal Ground Acceleration (PGA)	0.753g

In design, vertical acceleration may be assumed to about 1/3 to 2/3 of the estimated horizontal ground accelerations (PGA) described.

It should be noted that lateral force requirement in design should be intended to resist total structural collapse due to the described PGA of 0.753g or greater. However, during the lifetime use of the structure built, it is our opinion that some structural damage may be anticipated requiring structural repairs and/or replacement. Use of flexible lifeline connections are suggested.

TABLE 3.4.1 A2: Seismic Design Coefficients

CBC Chapter 16	2022 ASCE 7-16 Standard Seismic Design Parameters	Recommended Values
1613A.5.2	Site Class	D
1613.5.1	The mapped spectral accelerations at short period	S_s
1613.5.1	The mapped spectral accelerations at 1.0-second period	S_1
1613A5.3(1)	Seismic Coefficient, S_s	1.766g
1613A5.3(2)	Seismic Coefficient, S_1	0.658g
1613A5.3(1)	Site Class D / Seismic Coefficient, F_a	1g
1613A5.3(2)	Site Class D / Seismic Coefficient, F_v	n/a
16A-37 Equation	Spectral Response Accelerations, $S_{Ms} = F_a S_s$	1.766g
16A-38 Equation	Spectral Response Accelerations, $S_{M1} = F_v S_1$	n/a
16A-39 Equation	Design Spectral Response Accelerations, $S_{Ds} = 2/3 \times S_{Ms}$	1.177g
16A-40 Equation	Design Spectral Response Accelerations, $S_{D1} = 2/3 \times S_{Ms}$	n/a

4.0 Evaluations and Recommendations

4.1 General Evaluations

Based on field explorations, laboratory testing, and subsequent engineering analyses, the following tentative conclusions and recommendations are presented for initial study:

(I) From a geotechnical viewpoint, the site is considered grossly stable for the proposed development, provided that the recommendations supplied herein are incorporated in design and construction. Foundation design should reflect considerations of the seismically induced PGA as described.

(II) Based on the dry, silty, gravelly, variable consistency nature of the upper soils existing as encountered, it is our opinion that for structural support the load bearing soils should be reworked in the form of subexcavations, followed by scarification, moisturization, and their replacement as engineered fills compacted to minimum 90%. In the event that new fill soils are required over the current grade surface such should be placed on the original grades when prepared as described.

(III) The subexcavation depths during mass grading as described in the following section should be considered as "minimum". During grading, localized deeper subexcavations may be required within areas underlain by buried debris, utilities, localized fills or soft soils and others. It will be the responsibility of the grading contractor to inform the project geotechnical engineer of the presence of such prior to further site preparations and grading.

(IV) In order to minimize potential for differential settlements, it is recommended that structural footings should be established exclusively into engineered fills of local soils compacted to the minimum as recommended in this report. Construction of footings and slabs straddling over cut and fill transition conditions shall be avoided.

(V) Structural design consideration should include probability for "moderate" peak ground acceleration from relatively active nearby earthquake faults. Implementing the seismic design parameters and procedures as outlined in the current CBC and as described earlier, however, may minimize the adverse effects for the structures proposed.

(VI) Although no groundwater was encountered, provisions should be maintained during construction to divert incidental rainfall away from the structural pads constructed.

(VII) It is our opinion that, if site preparations and grading are performed as recommended and as per the generally accepted construction practices and current CBC, the proposed development will not adversely affect the stability of the site or its adjacent.

4.1.1 Recommendations for Site Preparations and Grading for Structural Support

In absence of detailed development plans review, the planned structural pad grades are assumed at/or near the existing grade surface. For adequate structural support, it is our opinion that moderate site preparations and grading should be included in the form of subexcavations of the near grade dry, silty, gravelly, variable consistency soils and their replacement as engineered fills compacted to minimum 90%.

In general, site preparations and grading should include subexcavations of the near surface soils to about:

(i) minimum 5 feet below the current grade surface or
(ii) to the depth as required to expose the underlying moist and dense natural subgrades or
(iii) to the depth as required to maintain a 24-inch-thick compacted fill mat blanket below foundation bottoms, whichever is greater.

The site preparations and grading described should encompass, at a minimum, the proposed structural footprint areas and minimum 5 feet beyond or as suggested by the geotechnical engineer during grading. No cut and fill transition conditions should be allowed.

Within areas requiring fill soils, if any, such may be placed following sufficient subexcavations to expose the underlying dense subgrades as approved by the project geotechnical engineer. During grading, the engineered fills placed should be compacted to near Optimum Moisture and with minimum 90% compaction of soils' Maximum Dry Density as determined by ASTM D1557.

The subexcavation depths described should be considered as "preliminary". Localized additional subexcavations may be required within areas underlain by undocumented old fills, buried utilities and abandoned sewer and/or buried septic systems. It is recommended that the excavated subgrades should be verified and approved by the geotechnical engineer prior to structural fill soil placement. Supplemental recommendations may be warranted following detailed development plans review.

Mass grading required for the project is recommended to encompass, at a minimum, the entire individual structural pads and beyond.

For reference, supplemental general mass grading recommendations are included Section 5 of this report.

4.2 Structural Fill Material Requirements

The local and/or imported fills, if required, should be gravelly sand, free of organics, roots, debris, and rocks larger than 6 to 8-inch in diameter.

Although no significant variations in soil conditions are anticipated, actual soils conditions may vary during grading. It will be the contractor's responsibility to notify Soils Southwest, Inc. about such variations for revised/updated geotechnical recommendations.

Non-expansive in nature, the on-site soils free of organic, debris, and rocks larger than 8-inch in load bearing structural backfills placed should be compacted to minimum 90% of the soils' Maximum Dry Density as determined by ASTM D1557 test method. Import soils, if required, should be non-expansive, gravelly sand and meeting the following criteria:

Liquid Limit	<35
Plasticity Index	<15
Expansion Index	<20

4.2.1 Structural Fill Soils Placement

Within the areas of structural loadings, it is our opinion that the near grade soils should be subexcavated to minimum 5 feet depth. For adequate structural bearing, it is our opinion that the excavated soils may be placed in 6 to 8-inch lifts with near Optimum Moisture Conditions compacted to minimum 90%. No structural fills should be placed during unfavorable weather conditions.

4.2.2 Cut and Fill Transition Conditions Pad Preparations (if applicable)

Use of cut and fill transition conditions should be avoided to minimize potential for differential settlements to footings and concrete slabs-on-grade. Within cut and fill transition areas, if it becomes essential, it is suggested that following the necessary cut, the entire structural pad should be prepared so as to establish a uniform bearing compacted fill mat prepared in conformance to the general guidelines as described below.

Pad Preparation Guidelines for Cut and Fill Transition Condition Areas

Fill Depth Required for Finish Grade (Within low-lying areas)	Overexcavation Depth below Finish Grade (Within cut areas)
Up to 5 feet	Equal Depth
5 to 10 feet	5 feet
Greater than 10 feet	One-half the maximum thickness of fills placed on the "fill" portion (20 feet maximum)

Cut portions should be overexcavated beyond the structural perimeter lines for a horizontal distance equal to the depth of overexcavation or to a minimum distance of 5 feet, whichever is greater. Actual subexcavation depths should be determined by the geotechnical engineer during grading.

4.3 Structural Foundation Design Parameters

In the absence of detailed development plans review, it is assumed that for load bearing support conventional continuous wall foundations and isolated spread footings will be used bearing directly on the engineered graded fills placed as described earlier in this report.

It is assumed that the subject development will include concrete tilt-up or concrete framed, concrete block construction with concrete slabs-on-grade and concrete footings in the form of isolated pier foundations or continuous wall foundations. Use of load bearing concrete wall and/or isolated spread footings are assumed to be used underlain by at least 30-inch-thick engineered fill mat of local soils compacted to minimum 90% as recommended earlier.

Structural foundations, in the form of exterior load bearing wall foundations and isolated pier foundations, may be considered in design based on the following equations:

Continuous Wall Footing: $q_{allowable} = 2000 + 350d + 250b$
Isolated Square Footing: $q_{allowable} = 2400 + 350d + 100b$, where

$q_{allowable}$ = allowable soil vertical bearing capacity, in psf
d = footing depth, minimum 30-inch,
b = footing width, minimum 24-inch.

The above soil bearing capacities may be increased for each additional depth in footing and width in excess of the minimum recommended. Under static loading conditions, with a Factor of Safety, FS = 3.0, the total maximum vertical bearing capacity is recommended not to exceed 3500 psf for continuous wall footings and isolated square footings. If normal code requirements are applied, the above capacities may further be increased by an additional 1/3 for short duration of loading which includes the effect of wind and seismic forces. The load bearing footings should be reinforced with minimum 2-#5 near the near the top and 2-#5 rebar near bottom of continuous wall footings. For isolated foundations reinforcing requirements shall be determined by the project structural engineer. Actual foundation dimensions (b & d) and reinforcement requirements should be provided by the project structural engineer based on anticipated structural dead loadings, soil bearing capacity, and Peak Ground Acceleration (PGA) described.

The footing depths described should be measured vertically from the lowest adjacent outside grade and not from the finished pad grade or from finished floor surface. Footing depths and dimensions shall be verified by the geotechnical engineer prior to footing-forming, rebar, and concrete placement. It will be the contractor's responsibility to arrange such verifications by the geotechnical engineer.

Based on the laboratory determined soils' consolidation characteristics, settlements to properly designed and constructed foundations supported exclusively into engineered fills of site soils or its equivalent or better, and carrying maximum assumed structural loadings, are expected to be within "tolerable" limits.

Under static loading conditions, over a 40-foot-span, the estimated total and differential settlements should be about 1 and 1/2-inch, respectively, provided the foundations being supported by engineered fills of local soils compacted to minimum 90% as described. Most of the elastic deformations, however, are expected to occur during construction.

4.4 Concrete Slabs-on-Grade

No concrete slabs, sidewalks and flatworks should be placed bearing directly on the surface soils currently existing. The prepared subgrades to receive footings should be adequate for concrete slab-on-grade placement. The following is provided for reference only.

Building Pad Warehouse/ Truck Traffic:

1. Suggested 5-inch-thick (net) slab thickness,
2. 2500 psi concrete with water/cement ratio of 0.64 maximum,
3. #4 rebar @ 18-inch o/c using chairs or as required by the project structural engineer,
4. Within moisture sensitive areas, it is suggested to use 10-mil-thick commercially available StegoWrap, Visqueen or other approved coverings,
5. Two (2) inches of sand with SE>30 over the installed Stego Wrap System,
6. Saw cuts requirements shall be as per the structural engineer.

Driveways:

1. 6-inch-thick net slab,
2. 2500 psi concrete with water/cement ratio of 0.64 maximum,
3. Over native grade compacted to a maximum of 95%.

Flatwork:

1. 3 ½-inch-thick net concrete,
2. 2500 psi concrete with water/cement ratio of 0.64 maximum,
3. Over native grade compacted to a minimum 90%,
4. Tooled joints per the structural engineer.

It is recommended that, prior to concrete pours, utility trenches underlying concrete slabs and driveways should be thoroughly backfilled with sandy gravelly soils, mechanically compacted to the minimum compaction requirements as described.

Within moisture sensitive areas, concrete slabs should be underlain by 2-inch of compacted clean sands, followed by 10-mil-thick vapor barrier, such as commercially available StegoWrap, Visqueen or other approved coverings, overlying an additional 2-inch-thick layer of sands. Sands used should have a Sand Equivalent, SE of 30 or greater.

Subgrades to receive concrete foundations and slab-on-grade should be "'dampened" as would be expected in any such concrete placement. Use of low-slump concrete is recommended. In addition, it is recommended that utility trenches underlying concrete slabs and driveways should be thoroughly backfilled with gravelly sandy soils mechanically compacted to minimum 90%. Concrete construction joint requirements should be determined by the project structural engineer.

No concrete should be placed during extreme weather conditions, such as during high outside temperature and/or during high Santa Ana wind conditions. Use of excess water on finished grade is not recommended to prevent post-placement concrete "warping".

4.4.1 Concrete Curing and Crack Control

The recommendations presented in this report are intended to reduce potentials for cracking of concrete slabs-on-grade due to concrete curing or settlement. However, even when the following recommendations have been implemented, foundations, stucco walls and concrete slabs-on-grade may display some minor cracking due to minor soil movement and/or concrete shrinkage.

The occurrence of concrete cracking may also be reduced and/or controlled by limiting the slump of the concrete used, proper concrete placement, and curing along with using crack control joints at reasonable intervals where re-entrant slab corners occur. For standard crack control, maximum expansion/construction joint spacing is recommended not to exceed 24 to 30 x the concrete thickness. Shorter distance between joint spacing would provide greater crack control. Joints at curves and angle points are suggested as determined by the project structural engineer.

To minimize potentials for "warping", subgrades to receive concrete shall be free of excess water. Concrete placements during adverse weather conditions should not be allowed.

4.5 Resistance to Lateral Loads

Resistance to foundation lateral displacement can be achieved by friction acting at the base of foundation and by passive earth pressures. A coefficient friction of 0.40 may be assumed with normal dead load forces for footing established on engineered compacted fills of local soils.

An allowable passive lateral earth resistance of 300 psf per foot of depth may be assumed for the sides of foundations poured against compacted fills. The maximum lateral passive earth pressure is recommended not to exceed 3000 lbs.

For design, active lateral pressures from local soils when used as backfills may be estimated from the following equivalent fluid density:

CONDITIONS	EQUIVALENT FLUID DENITY, pcf	
	Level Backfill	2:1 Backfill Sloping Upwards
Active	40	55
At Rest	55	70
Seismic	75% of active earth pressures	75% of active earth pressures

4.6 Shrinkage and Subsidence

It is our opinion that during grading the upper soils may be subjected to a volume change. Assuming a 90% relative compaction for structural fills and assuming an overexcavation and recompaction depth as described earlier, such volume change due to shrinkage may be on the order of 7% to 10%. Further volume change may be expected due to supplemental shrinkage during preparation of subgrade soils. For estimation purpose, such may be approximated to about 2-inch when conventional construction equipment is used.

4.7 Construction Considerations

4.7.1 Unsupported Excavation

Gravelly sandy site soils encountered are considered highly susceptible to caving. Temporary excavations up to 4 feet in depth may be made without rigorous lateral support. Excavated surface should be "'wetted" during construction to minimize potential surface soil raveling. No surcharge loading should be allowed within an imaginary 1:1 line drawn upward from the toe of the temporary excavations.

4.7.2 Supported Excavations

If vertical excavations exceeding 4 feet in depth become warranted, such should be achieved using shoring to support sidewalls.

4.8 Soil Caving

Considering the gravelly sandy site soils encountered as described, it is our opinion that some caving may be expected during deep excavations. Temporary excavations in excess of 5 feet should be made at a slope ratio of 2 to 1 (h:v) or flatter, or as per the construction guidelines as provided by Cal-Osha.

4.9 Site Preparations for Driveways/Parking/Paving

Assuming concrete paving for use by conventional traffic, it is suggested that prior to concrete placement, the subgrades to receive paving should be subexcavated to minimum 18 inches, followed by the local excavated soils replacement in 6 to 8-inch-thick lifts, compacted to minimum 95%. Use of vibratory sheepsfoot roller is suggested during grading.

4.10 Pavement Thickness Design

Alternative I - Rigid Concrete Paving

Rigid paving, if selected, should be at least 6-inch-thick concrete placed directly over the local sandy gravelly soils compacted to minimum 95%. Alternatively, 5-inch thick concrete can be considered over 4-inch class II base material compacted to 95%. Actual paving thickness and reinforcement requirements should be supplied by the project structural engineer using soils' Subgrade Reaction Modulus, kcf of 350.

Rigid concrete driveways should have thickened edges to prevent potential for lateral sliding under auto and truck traffic loading.

Alternative II - Asphalt Paving

Flexural asphalt paving, if selected, based on the estimated Traffic Indices (TIs) as described and a laboratory determined soils' R-value of 75 and laboratory determined soils' Sand Equivalent, SE of 46.76, the following flexible (a.c.) pavement sections are provided for initial use:

Service Vehicle	Traffic Index, TIs	Pavement Type	Paving Thickness (inch)
Auto/ Truck Traffic	7	a.c. over Class II base or CMB	3.0 over 3.0 5.0 over native
	10	"	5.0 over 3.0

Within paving areas, subgrade soils should be subexcavated to minimum 18 inches, moisture conditioned to near Optimum Moisture Content, followed by the excavated soils replacement as engineered fills compacted to at least 95% of the soils' maximum Dry Density as determined by the method ASTM D1557. Class II base or CMB used to receive asphalt concretes should be placed directly over the prepared subgrades and compacted to minimum 95%. Use of thicker/deepened paving edges are recommended to minimize potential for edge movement and paving distress.

The pavement evaluations are based on estimated Traffic Index (TI) as shown and on the soils' R-value as described. It is recommended that following mass grading completion, representative site soils should be laboratory tested to determine soils' R-value and to provide updated paving thickness.

4.11 Retaining Wall (if planned)

It is unknown if any retaining structure will be associated with development proposed. It is our opinion that retaining foundations should be designed based on a soils vertical bearing capacity of 1800 psf, along with the lateral active pressures as described below:

Slope of Retained Material (h:v)	Equivalent Fluid Density, pcf	
	Clean Sand	Local Soil
level	30	35
2:1	42	55

During a local Magnitude 6.7 earthquake along the Cucamonga fault zone, additional lateral pressures will occur along the back of the retaining walls. The seismic-induced lateral soil pressure may be computed using a triangular pressure distribution with the maximum value at the top of the wall> The maximum lateral pressure of (20 pcf) H where H is the height of the retained soils above the wall footing should be used in the final design of retaining wall.

Sliding resistance value and passive fluid pressure values may be increased by 1/3 during short-erm wind and seismic loading conditions.

Any applicable short-term construction surcharges and seismic forces should be added to the above lateral pressure values. All walls shall be waterproofed and protected from hydrostatic pressure by a reliable permanent subdrain system.

The design parameters do not include any hydrostatic pressure build-up. Consequently, installation of "'French-drain" behind retaining walls is recommended to minimize water pressure build-up behind retaining walls. Use of impervious material is preferred within upper the 18 inches of the backfills placed.

Backfills behind retaining wall should be compacted to a minimum 90% of the soils' Maximum Dry Density as determined by the ASTM D15571 test method. Flooding and/or jetting behind wall should not be permitted.

Walls adjacent to traffic areas should be designed to resist a uniform lateral pressure of 100 psf, which is a result of an assumed 300 psf surcharge behind the walls due to normal traffic. If the traffic is kept back 10 feet from the wall, the traffic surcharge may be neglected.

4.12 Utility Trenches Backfill

Utility trenches backfills at depth in excess of 2 feet should be placed in thin lifts and compacted to the minimum requirements described. As an alternative, clean granular sand may be used having Sand Equivalent, SE of minimum 30. Jetting is not recommended in lieu of mechanical compaction. Trench excavations should conform to the requirements and safety as specified by Cal-Osha.

4.13 Seasonal Limitations

No fill shall be placed, spread or rolled during unfavorable weather conditions. Where the work is interrupted by heavy rains, fill operations shall not be resumed until moisture conditions are considered favorable by the geotechnical engineer.

4.14 Planters

To minimize potential differential settlement to foundations, planters requiring heavy irrigation should be restricted from using adjacent to footings. In the event that such becomes unavoidable, planter boxes with sealed bottoms should be considered.

4.15 Landscape Maintenance

Only the amount of irrigation necessary to sustain plant life should be provided. Pad drainage should be directed towards streets and to other approved areas away from foundations. Slope areas should be planted with draught resistant vegetation. Over watering landscape areas could adversely affect the proposed site development during its lifetime use.

4.16 Observations and Testing During Site Preparations and Grading

Recommendations provided assume that structural footings and slabs-on-grade be established exclusively into compacted fills. Excavated footings should be inspected, verified, and certified by the geotechnical engineer prior to steel and concrete placement to ensure their sufficient embedment and proper bearing as recommended. Structural backfills discussed should be placed under direct observation and testing by Soils Southwest, Inc. Excess soils generated from footing excavations should be removed from pad areas.

In general, geotechnical inspections should include, at a minimum, the following:

- Subexcavation depth during grading,
- Fill compaction testing,
- Retaining wall backfill compaction (if planned),
- Excavated foundation depth,
- Paving subgrade verification, and
- Utility trenches backfill compaction.

4.17 Plan Review

No precise grading or detailed development plans are prepared and none such are available for review. Prior to the actual mass grading, grading and foundation plans should be available to ensure applicability of the assumptions made in preparing this report. If during construction, conditions are observed different from those as presented, revised and/or supplemental recommendations will be required.

4.18 Pre-Construction Meeting

It is recommended that no clearing of the site or any grading operations be performed without the presence of a representative of this office. An on-site pre-grading meeting should be arranged between the geotechnical engineer and the grading contractor prior to the start of construction. Two days' advance notice for such meeting is required.

5.0 Earth Work/General Grading Recommendations

It is our opinion that the soils encountered primarily consist upper 3 feet of variegating layers of gravels and gravel silty fine to medium coarse sand mixtures with concentrations of rocks, cobbles, and occasional small boulders to the refusal depth of 3 feet explored. Descriptions of the soils encountered are provided in the attached Log of Borings.

Prior to grading commencement, it is suggested that all debris and loose stockpiles should be cleared and disposed off-site to the satisfaction of the geotechnical engineer. In general, site preparations and grading for the project should include, at a minimum, the following:

Structural Backfill

Local soils free of organics, debris, and rocks smaller than 6-inch in overall diameter should be considered suitable for reuse as structural backfill. Loose soils, formwork, and debris should be removed prior to backfilling retaining walls. Local soils backfill should be placed and compacted in accordance with the recommendations provided below. Where space limitations do not allow conventional backfilling operations, special backfill materials, and procedures may be required. Pea gravel or other select backfill can be used within limited space areas. Additional recommendations on such will be provided during construction.

Percentage Compaction During Mass Grading

With the presence of fine to coarse gravelly sandy soils with trace silts, isolated cobbles and rocks existing as described and assuming moderately high dead loads and seismic peak ground acceleration described, it is our opinion that structural fills placed should be compacted to the minimum 90% compaction requirements described. During grading, use of vibratory sheepsfoot roller is recommended.

Site Drainage

Adequate positive drainage should be maintained away from the structural pad in order to prevent water from ponding and to reduce potential percolation into backfill. A desirable slope for surface drainage is 2% in landscape areas and 1% in paved areas. Planters and landscaped areas adjacent to building perimeter should be adequately designed to minimize water filtration into subsoils. Considerations should be given to the use of closed planter bottoms, concrete slabs, and perimeter subdrains where applicable.

Utility Trenches

Buried utility conduits should be bedded and backfilled around the conduit in accordance with the project specifications. Buried utilities in excess of 2 feet should be backfilled with local gravelly sandy soils and compacted to at least 90%. Remaining near surface backfills should be compacted to 95%.

General Grading Recommendations:

Recommended general specifications for surface preparation to receive compacted engineered fills for structural support and utility trench backfill and others are presented below:

1. Areas to be graded, backfilled or paved, shall be grubbed, stripped, and cleaned of all buried and undetected debris, structures, concrete, vegetation and other deleterious materials prior to grading.

2. During grading, the estimated subexcavation depths within building pad areas and 5 feet beyond should be minimum 5 feet below the current grade surface.

3. Where compacted fill is used to provide vertical support for foundations, all loose, soft, and other incompetent soils should be removed to full depth as approved by the geotechnical engineer.

4. Compaction for structural fills shall be determined relative to the Maximum Dry Density as determined by ASTM D1557 compaction methods. All in-situ field density of compacted fill shall be determined by the ASTM D1556 standard methods or by other approved procedures.

5. All new imported soils, if required, shall be clean, granular, and non-expansive material requiring prior approval by the geotechnical engineer.

6. During grading, fill soils shall be placed as thin layers, thickness of which following compaction shall not exceed 6 inches.

7. In accordance with the CBC: rock sizes greater than 12 inches (305 mm) and up to 24 inches (610 mm) in maximum dimension shall be three feet (914 mm) or more below grade, measured vertically. Rock sizes greater than 24 inches (610 mm) in maximum dimension shall be 10 feet (3048 mm) or more below grade, measured vertically.

8. No jetting and/or water tampering be considered for backfill compaction for utility trenches without prior approval of the geotechnical engineer. For such backfill, hand tampering with fill layers of 8 to 12 inches in thickness or as approved by the geotechnical engineer is recommended.

9. Any and all utility trenches at depth as well as cesspool and abandoned septic tank within building pad area and beyond, should either be completely excavated and removed from the site or should be backfilled with gravel, slurry or by other material, as approved by the geotechnical engineer.

10. Any and all import soils if required during grading should be equivalent to the site soils or better. The geotechnical engineer prior to their use should approve such.

11. Any and all grading required for pavement, sidewalks or other facilities to be used by general public, should be constructed under direct observation of the geotechnical engineer or as required by the local public agencies.

12. A site meeting should be held between the grading contractor and the geotechnical engineer prior to actual site preparations and grading. Two days advance notice will be required for such meeting.

6.0 WQMP-BMP Infiltration Rates Using Porchet Method for Stormwater Disposal Design

In general, four (4) infiltration tests were planned at the depth and locations as suggested by the project design engineer. Considering the excessively gravely sands and concentrations of rocks, cobbles, and occasional small boulders, infiltration testing was limited to the depths of 3 and 5 feet below existing surface grade (BSG) at the southwest where 8-foot testing was planned. Planned testing (P-3 and P-4) at depths 3 to 4 feet within the area of the planned basin/swale could not be performed due to resistance at 1 and 1.5 feet due to concentrations of rocks, cobbles, and small boulders. The tests were performed using the standardized "falling-head" test converted using the Porchet method. Test locations and test data are shown in the attached Appendix D.

Method of infiltration rate as per the guidelines in accordance with Table 1, Infiltration Basin Option 2 of Appendix A of the Riverside County-Low Impact Development (LID) BMP Design Handbook as well as per the Appendices Section VII.3.8.2, Appendix VII: Infiltration Rate Evaluation Protocol and Factor of Safety Recommendations of the San Bernardino County Technical Guidance Document for Water Quality Management Plans Handbook.

Approximate test locations are shown on the attached Plate 1. The test results should be considered tentative given the potential for changes to site finish grades or changes in soil conditions as exposed during site preparations and grading.

The soils encountered within the proposed chamber consist, in general, of dry gravels and fine to medium coarse poorly graded silty sands overlying variegating layers of gravels and silty fine to medium coarse sands with rocks and cobbles to the depth explored of 3 and 5 feet as described (test borings P-1 to P-2). Descriptions of the soils encountered are provided in the attached Log of Borings.

Based on the field infiltration testing completed, it is our opinion that for the infiltration system design proposed at about 3 and 5 feet below grade, the observed soils infiltration rates are 19.79 inches/hour and 15.62 inches/hour for test locations P-1 and P-2, respectively.

For design, it is suggested that use of an appropriate factor of safety as determined by the design engineer should be considered to the observed rate to account for long-term saturation, inconsistencies in subsoil conditions, potential for silting, and lack of maintenance. The observed soils' percolation rates are provided in Section 6.3 of this report.

6.1 METHODOLOGY AND TEST PROCEDURES

EQUIPMENT SET-UP (POST EXCAVATION) PROCEDURES:

Following test boring completion, each of the test holes were fitted with perforated PVC pipes backfilled with 2-inch-thick crushed rock at the bottom to minimize potentials for scouring and caving. For testing, each test hole was initially filled using water supplied by water jugs.

Prior to actual testing, to determine test intervals, as per the Section 2.3 for deep percolation testing of the referenced handbook guideline, two consecutive readings were performed to determine if 6 or more inches of water seeped in 25 minutes. Since 6 inches or more of water seeped away in less than 25 minutes for all test locations, P-1 and P-2 , subsequent percolation testing was performed at 10-minute time intervals for at least minimum one hour or until the rates were uniform. Testing included water placement at about and 3 feet below existing grade surface (inlet depth of 24 inches above infiltration system bottom).

The final 10-minute recorded percolation test rates were converted into an Infiltration Rate (I_t) for inches per hour using the "Porchet Method" equation as described in the Reference 2, Riverside County Low Impact Development BMP Design Handbook, as well as per the Appendices Section VII.3.8.2, Appendix

VII: Infiltration Rate Evaluation Protocol and Factor of Safety Recommendations on the San Bernardino County Technical Guidance Document for Water Quality Management Plans Handbook.

6.2 INFILTRATION TEST RESULTS

Based on the soils infiltration testing completed at the test locations and at the test depth as described, the observed soils' percolation rates are 19.79 inches/hour and 15.62 inches/hour for test locations P-1 and P-2, respectively.

Calculations to convert the percolation test rate to infiltration test rates in accordance with Section 2.3 of the County Handbook are presented in Table I and II below. For design, it is suggested that an appropriate Factor of Safety as selected by the design engineer should be considered to the observed field percolation rate described.

6.2.1 SUMMARY & CONVERSION CALCULATIONS

TABLE I

For WQMP-BMP design, based on the soils infiltration testing completed and, on the calculations as described, the following infiltration rates may be considered. Actual field test data are attached.

Observed Infiltration Rate for Design

Test Location (8-9-24)	Test Depth Below Grade, feet	Porchet Method Observed Rate, inch/hour
P-1	3	19.79
P-2	5	15.62
P-3	n/a	n/a
P-4	n/a	n/a

Note: n/a: due to shallow boring resistance to near surface concentrations of rocks, cobbles, and small boulders, infiltration tests could not be performed at the required depths.

TABLE II
Conversion Table (Porchet Method)

Test No.	Depth Test Hole, inches	Time Interval, minutes	Initial Depth, inches	Final Depth, inches	Initial Water Height, inches	Final Water Height, inches	Change in Height/ Time	Average Head Height/Time
	Dt	ΔT	D_O	D_f	$H_o=D_t-D_o$	$H_f=D_t-D_f$	$\Delta H= H_f-H_O$	$H_{avg} = (H_o+H_f)/2$
P-1	36	10	12	35.5	24.0	0.5	23.50	12.25
P-2	60	10	36	56.5	24.0	3.5	20.50	13.75

	Infiltration Rate (It)=ΔH60r/Δt(r+2Havg)		
	A	B	C
Test No.	ΔH60r	Δt(r+2Havg)	A/B=in/hr
P-1	5640	285	19.79
P-2	4920	315	15.62

Use of a safety factor should be considered to account for long-term saturation, inconsistencies in subsoil conditions along with the potential for silting of percolating soils.

The infiltration rate described is based on the in-situ testing completed at the locations as suggested by the project civil engineer. In the event that the final chamber location and depth vary considerably from those described herein, supplemental soils infiltration testing may be warranted.

It should be noted that over prolonged use and lack of maintenance the detention/infiltration basins or deep chambers constructed based on the suggested design rate may experience much lower infiltration rate due to the accumulation of silts, fines, soils, and others. Regular maintenance of the chambers in the form of removal of debris, oil, and fines are strongly recommended. A maintenance record of such is suggested for future use.

Suggested Requirements for Standard Stormwater BMP installation (where applicable)
The invert of stormwater infiltration should be set at least 10 feet above the groundwater elevation and should not be placed on steep slopes to create conditions for slopes instability.

When adequately installed, it is our opinion that the Stormwater infiltration systems installed should not increase the potential for static or seismic settlement of structures.

Stormwater infiltration installed should not place an increased surcharge on structures or foundations on or its adjacent. The pore water pressure should not increase the soils retained by retaining structures.

The invert of stormwater infiltration should be set back at least 15 feet and outside a 1:1 plan drawn up from the bottom of adjacent foundations.

Stormwater infiltration should not be located near utility lines where the introduction of stormwater could cause damage to utilities or settlement of trench backfill.

Stormwater infiltration systems should not be allowed within 100 feet of any potable groundwater production well.

Once installed, regular maintenance of the detention systems is recommended.

7.0 Closure

The conclusions and recommendations presented are based upon the findings and observations as made during subsurface test excavations and subsequent laboratory testing and engineering evaluations as currently used in the Geotechnical industry. The recommendations supplied should be considered "preliminary" since they are based on soil samples only. If during construction, the subsoil conditions appear different from those as disclosed during field investigation this office should be notified to consider any possible need for modification by the geotechnical recommendations as provided in this report.

Recommendations provided are based on the assumptions that structural footings will be established exclusively into compacted fill. No footings and/or slabs should be allowed straddling over cut and fill transition interface.

Site grading observations and testing must be performed by a representative of this office. Further, it is recommended that excavated footings should be verified and approved by geotechnical engineer prior to steel and concrete placement to ensure that foundations are founded into satisfactory soils and excavations are free of loose and disturbed materials.

A pre-grading meeting between grading contractor and geotechnical engineer is recommended prior to construction preferably at the site, to discuss the grading procedures to be implemented and other requirements described in this report to be fulfilled.

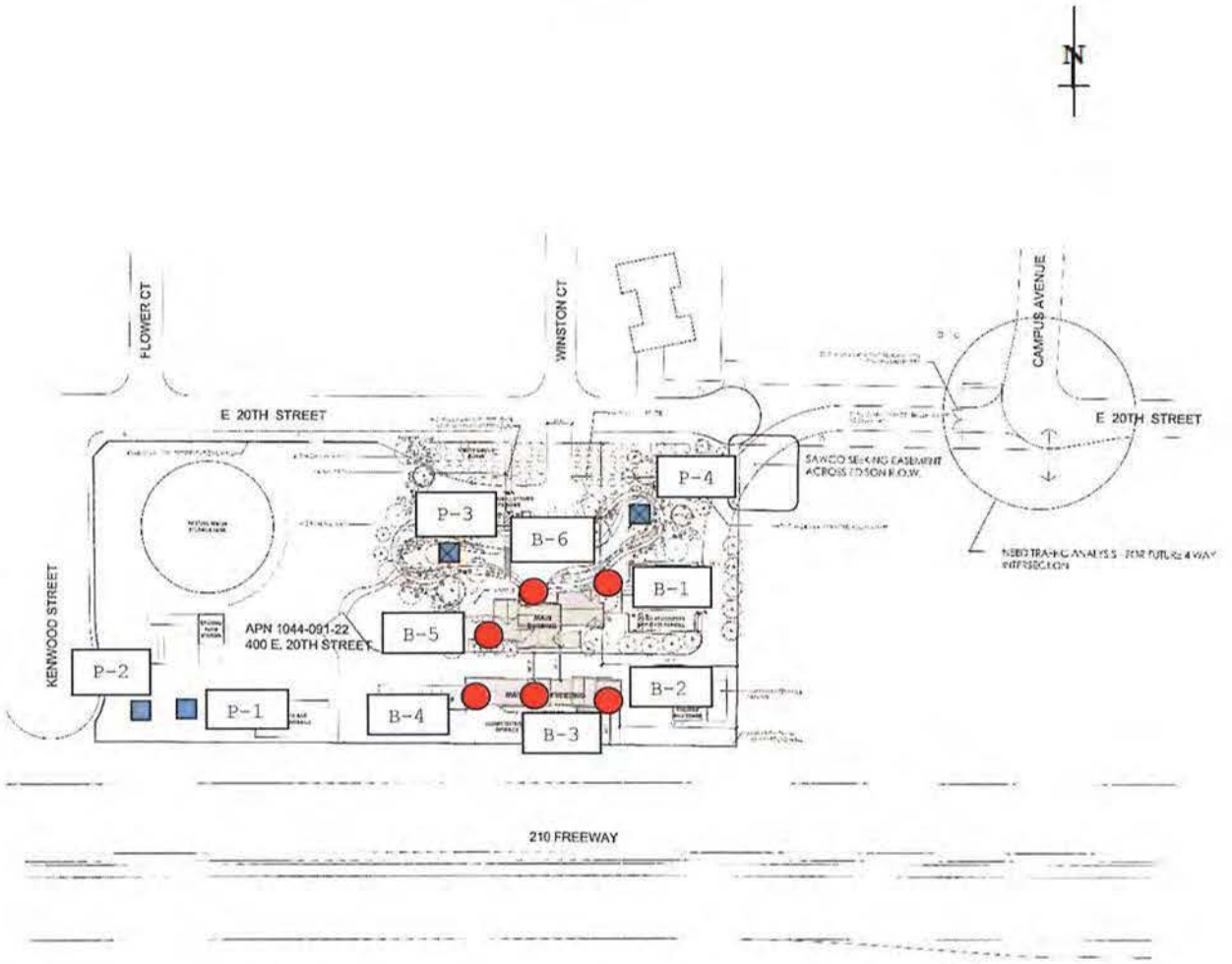
This report has been prepared exclusively for the use of the addressee for the project referenced in the context. It shall not be transferred or be used by other parties without written consent by Soils Southwest, Inc.

Should the project be delayed beyond one year after the date of this report, the recommendations presented shall be reviewed to consider any possible change in site conditions.

The recommendations presented are on the assumption that the necessary geotechnical observations and testing during construction will be performed by a representative of this office. The field observations are considered a continuation of the geotechnical investigation performed.

If another firm is retained for geotechnical observations and testing, our professional liability and responsibility shall be limited to the extent that Soils Southwest, Inc. would not be the geotechnical engineer of record. Use of the geotechnical recommendations by others will relieve Soils Southwest, Inc. of any liability that may arise during the lifetime use of the structure constructed.

PLOT PLAN AND TEST LOCATIONS
400 E. 20th Street, Upland
APN: 1044-091-22
Not to Scale



Legend:

- B-1 Approximate Location of Test Borings for Geotechnical Evaluations
- P-1 Approximate Location of Test Pit for BMP Soils' Infiltration
- P-3 Approximate location of Test Pit for BMP Soils Infiltration that could not be performed as planned due to surface concentrations of rocks, cobbles, and small boulders.

List of Appendices

Appendix A - Log of Borings

Appendix B - Laboratory Test Results

Table I: In-Situ Moisture-Density (ASTM D2216 and D2937)

Table II: Max. Density/Optimum Moisture Content (ASTM D1557)

Table III: Direct Shear (ASTM D3080)

Table IV: Consolidation (ASTM D2435)

Table V: Sand Equivalent, SE (ASTM D2419)

Table VI: Sieve Analysis (ASTM D422)

Table VII: Soils' Chemical Analyses Test Results

Table VIII: Soils' Density Correlation to SPT Blow Counts

APPENDIX C – Supplemental Seismic Design Parameters &
FEMA National Flood Hazard Layer Map

APPENDIX D - Field Infiltration Test Data Porchet Method Calculation Summary

LOG OF BORINGS

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING B-1

Project: San Antonio Water District Headquarters		**Job No.:** 24036-F/BMP
Logged By: John F.	**Boring Diam.:** 8" HSA	**Date:** August 9,2024

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					GP			disturbed surface soils, gravels, scattered debris
					GM-SM			GRAVELS consisting of rocks and cobbles - (Max Dry Density = 133 pcf @ 8.0 %
							5	GRAVEL/SAND mixture-tannish light brown, silty, fine to medium coarse, pebbles, rock fragments, rocks, cobbles, dry
							10	- Abandoned at +/- 3.0 ft. due to resistance (concentrations of rocks and cobbles) - no bedrock - no groundwater
							15	
							20	
							25	
							30	

Groundwater: n/a **Approx. Depth of Bedrock:** n/a **Datum:** n/a **Elevation:** n/a	**Site Location** Planned Headquarter Facility 400 East 20th Street Upland, California	**Plate #**

Bulk/Grab sample

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING B-2

Project: San Antonio Water District Headquarters		**Job No.:** 24036-F/BMP
Logged By: John F.	**Boring Diam.:** 8" HSA	**Date:** August 9,2024

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					GP			gravels GRAVEL- rocks cobbles, small boulders, with very little yellow tan silty dry sand - Abandoned test boring @ 1.5 feet due to resistance (concentrations of rocks and cobbles - no bedrock - no groundwater
							5	
							10	
							15	
							20	
							25	
							30	

Groundwater: n/a **Approx. Depth of Bedrock:** n/a **Datum:** n/a **Elevation:** n/a	**Site Location** Planned Headquarter Facility 400 East 20th Street Upland, California	**Plate #**

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING B-3

Project: San Antonio Water District Headquarters		**Job No.:** 24036-F/BMP
Logged By: John F.	**Boring Diam.:** 8" HSA	**Date:** August 9,2024

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					GM-SM			gravels, scattered weeds and debris GRAVEL/SAND mixture-with gravely and slightly silty, fine to medium coarse, rock fragments, rocks, and cobbles, dry - Abandoned Test boring @ 2.0 ft. due to resistance (concentrations of rocks and cobbles) - no bedrock - no groundwater

Groundwater: n/a **Approx. Depth of Bedrock:** n/a **Datum:** n/a **Elevation:** n/a	**Site Location** Planned Headquarter Facility 400 East 20th Street Upland, California	**Plate #**

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING B-4

Project: San Antonio Water District Headquarters		**Job No.:** 24036-F/BMP
Logged By: John F.	**Boring Diam.:** 8" HSA	**Date:** August 9,2024

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					GM-SM			disturbed surface gravels and soils
								GRAVEL/SAND mixture-light tan silty, fine to medium coarse, rock fragments, rocks,cobbles occasional small boulders, dry
							5	- Abandoned test boring @ 0.5 ft. due to resistance (concentrations of rocks, cobbles, small boulders) - no bedrock - no groundwater
							10	
							15	
							20	
							25	
							30	

Groundwater: n/a
Approx. Depth of Bedrock: n/a
Datum: n/a
Elevation: n/a

Site Location

Planned Headquarter Facility
400 East 20th Street
Upland, California

Plate #

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING B-5

Project: San Antonio Water District Headquarters		**Job No.:** 24036-F/BMP
Logged By: John F.	**Boring Diam.:** 8" HSA	**Date:** August 9,2024

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					GM-SM			disturbed surface gravels and soils with rocks and cobbles
								GRAVEL/SAND mixture-tan to light brown, slightly silty, fine to medium coarse, rock fragments, rocks, and cobbles, dry
							5	- Abandoned test boring @ +/- 1.5 feet due to resistance(concentrations of rocks and cobbles) - no bedrock - no groundwater
							10	
							15	
							20	
							25	
							30	

Groundwater: n/a **Approx. Depth of Bedrock:** n/a **Datum:** n/a **Elevation:** n/a	**Site Location** Planned Headquarter Facility 400 East 20th Street Upland, California	**Plate #**

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING B-6

Project: San Antonio Water District Headquarters		**Job No.:** 24036-F/BMP
Logged By: John F.	**Boring Diam.:** 8" HSA	**Date:** August 9,2024

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
								gravels, rocks, cobbles GRAVEL/SAND mixture-light tan to brown, slightly silty, fine to medium coarse,rocks cobbles, dry
							5	- Abandoned test boring @ 2.0 ft. due to resistance (concentrations of rocks and cobbles) - no bedrock - no groundwater
							10	
							15	
							20	
							25	
							30	

Groundwater: n/a **Approx. Depth of Bedrock:** n/a **Datum:** n/a **Elevation:** n/a	**Site Location** Planned Headquarter Facility 400 East 20th Street Upland, California	**Plate #**

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING P-1

Project: San Antonio Water District Headquarters		**Job No.:** 24036-F/BMP
Logged By: John F.	**Boring Diam.:** 8" HSA	**Date:** August 9,2024

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					GM-SM			- disturbed surface gravels and soils
								GRAVELS/SAND mixture -light yellow tan,silty fine, dry with rocks and cobbles
					SM			SAND - gray-brown, silty, fine to medium coarse, pebbles, rock fragments, rocks, cobbles, dry
					GP		5	GRAVELS with little to no sand,rocks,cobbles
								- Abandoned infiltration test boring @3.0 ft due to resistance (concentrations of rock and cobbles) - no bedrock
								- no groundwater
							10	
							15	
							20	
							25	
							30	

Groundwater: n/a **Approx. Depth of Bedrock:** n/a **Datum:** n/a **Elevation:** n/a	**Site Location** Planned Headquarter Facility 400 East 20th Street Upland, California	**Plate #**

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING P-2

Project: San Antonio Water District Headquarters		**Job No.:** 24036-F/BMP
Logged By: John F.	**Boring Diam.:** 8" HSA	**Date:** August 9,2024

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					SM			disturbed gravels and soils
								SAND - yellowish tannish brown, silty, fine to medium coarse, pebbles, rock fragments, rocks, dry
								- with rocks and cobbles
					GP		5	GRAVELS
								- Abandoned infiltration test boring @5.0ft. due to resistance (concentrations of rocks and cobbles)
								- no bedrock
								- no groundwater
							10	
							15	
							20	
							25	
							30	

Groundwater: n/a
Approx. Depth of Bedrock: n/a
Datum: n/a
Elevation: n/a

Site Location

Planned Headquarter Facility
400 East 20th Street
Upland, California

Plate #

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING P-3

Project: San Antonio Water District Headquarters		**Job No.:** 24036-F/BMP
Logged By: John F.	**Boring Diam.:** 8" HSA	**Date:** August 9,2024

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					GM-SM			gravels, rocks, and cobbles
								GRAVEL/SAND mixture- light yellow gray tan, silty, fine, rock fragments, rocks, cobbles scattered small boulders, dry
								SAND (fill) - color change to light brown, silty, fine to medium coarse, pebbles, rock fragments, rocks, cobbles, scattered debris, dry
							5	- Abandoned infiltration test boring @ 1.5ft due to resistance (concentrations of rock and cobbles)
								- no bedrock
								- no groundwater
							10	
							15	
							20	
							25	
							30	

Groundwater: n/a **Approx. Depth of Bedrock:** n/a **Datum:** n/a **Elevation:** n/a	**Site Location** Planned Headquarter Facility 400 East 20th Street Upland, California	**Plate #**

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING P-4

Project: San Antonio Water District Headquarters		**Job No.:** 24036-F/BMP
Logged By: John F.	**Boring Diam.:** 8" HSA	**Date:** August 9,2024

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					GP			disturbed surface gravels and soils
								GRAVEL with little sand, rocks, cobbles,and occasional small boulders, dry
								- Abandoned infiltration test boring @ 1.0ft due to resistance(concentration of rocks cobbles)
							5	- no bedrock
								- no groundwater
							10	
							15	
							20	
							25	
							30	

Groundwater: n/a **Approx. Depth of Bedrock:** n/a **Datum:** n/a **Elevation:** n/a	**Site Location** Planned Headquarter Facility 400 East 20th Street Upland, California	**Plate #**

KEY TO SYMBOLS

Symbol	Description
Strata symbols	
	Poorly graded gravel
	Silty sand and gravel
	Silty sand

Notes:

1. Exploratory borings were drilled on August 9,2024 using a 4-inch diameter continuous flight power auger.

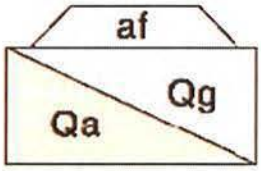
2. No free water was encountered at the time of drilling or when re-checked the following day.

3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.

4. These logs are subject to the limitations, conclusions, and recommendations in this report.

5. Results of tests conducted on samples recovered are reported on the logs.

LEGEND

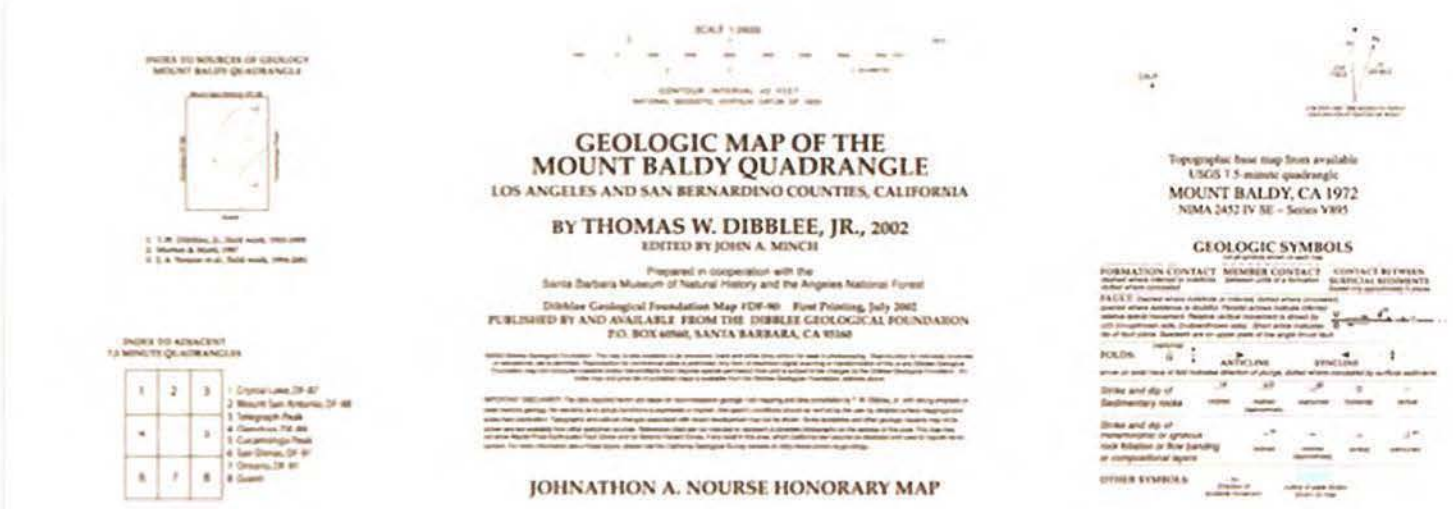


SURFICIAL SEDIMENTS

af *artificial fill*

Qg *alluvial gravel and sand of stream channels*

Qa *alluvial gravel and sand of valley areas*



GEOLOGIC MAP OF THE
MOUNT BALDY QUADRANGLE
LOS ANGELES AND SAN BERNARDINO COUNTIES, CALIFORNIA

BY THOMAS W. DIBBLEE, JR., 2002
EDITED BY JOHN A. MINCH

Prepared in cooperation with the
Santa Barbara Museum of Natural History and the Angeles National Forest

Dibblee Geological Foundation Map #DF-90 First Printing, July 2002
PUBLISHED BY AND AVAILABLE FROM THE DIBBLEE GEOLOGICAL FOUNDATION
P.O. BOX 60760, SANTA BARBARA, CA 93160

JOHNATHON A. NOURSE HONORARY MAP

Topographic base map from available
USGS 7.5-minute quadrangle
MOUNT BALDY, CA 1972
NIMA 2452 IV SE – Series V895

GEOLOGIC SYMBOLS

SOURCE: USGS/AASG National Geological Map/Map View (beta) NGMDB

USDA United States Department of Agriculture
Natural Resources Conservation Service

Contact Us | Subscribe | Archived Soil Surveys | Soil Survey Status | Glossary | Preferences | Link | Logout | Help

Area of Interest (AOI) | Soil Map | Soil Data Explorer | Download Soils Data | Shopping Cart (Free)

Search

Map Unit Legend

San Bernardino County Southwestern Part, California (CA677)

San Bernardino County Southwestern Part, California (CA677)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
HaC	Hanford coarse sandy loam, 2 to 9 percent slopes	11.8	17.2%
RmC	Ramona sandy loam, 2 to 9 percent slopes, MLRA 19	5.7	8.3%
SoC	Soboba gravelly loamy sand, 0 to 9 percent slopes	9.9	14.5%
SpC	Soboba stony loamy sand, 2 to 9 percent slopes	41.2	60.0%
Totals for Area of Interest		**68.7**	**100.0%**

Legend

Soil Map

Scale (not to scale)

San Bernardino County Southwestern Part, California

SpC—Soboba stony loamy sand, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: hckv
Elevation: 960 to 3,690 feet
Mean annual precipitation: 12 to 39 inches
Mean annual air temperature: 60 to 65 degrees F
Frost-free period: 260 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Soboba and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Soboba

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

Ap - 0 to 10 inches: stony loamy sand
C1 - 10 to 24 inches: very stony loamy sand
C2 - 24 to 60 inches: very stony sand

Properties and qualities

Slope: 2 to 9 percent
Surface area covered with cobbles, stones or boulders: 0.1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 19.99 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: R019XG912CA - Sandy Fan

Hydric soil rating: No

Minor Components

Hanford

Percent of map unit: 5 percent
Landform: Alluvial fans
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Ramona

Percent of map unit: 5 percent
Landform: Fan remnants
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Tujunga, gravelly loamy sand

Percent of map unit: 5 percent
Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Data Source Information

Soil Survey Area: San Bernardino County Southwestern Part, California
Survey Area Data: Version 15, Aug 30, 2023

San Bernardino County Southwestern Part, California

SoC—Soboba gravelly loamy sand, 0 to 9 percent slopes

Map Unit Setting

National map unit symbol: hckt
Elevation: 30 to 4,200 feet
Mean annual precipitation: 10 to 20 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 175 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition

Soboba and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Soboba

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 12 inches: gravelly loamy sand
H2 - 12 to 36 inches: very gravelly loamy sand
H3 - 36 to 60 inches: very stony sand

Properties and qualities

Slope: 0 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: R019XG912CA - Sandy Fan
Hydric soil rating: No

Minor Components

Unnamed
Percent of map unit: 5 percent
Hydric soil rating: No

Delhi, fine sand
Percent of map unit: 5 percent
Hydric soil rating: No

Tujunga, gravelly loam
Percent of map unit: 3 percent
Hydric soil rating: No

Unnamed
Percent of map unit: 2 percent
Landform: Drainageways
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: San Bernardino County Southwestern Part, California
Survey Area Data: Version 15, Aug 30, 2023

San Bernardino County Southwestern Part, California

HaC—Hanford coarse sandy loam, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: 2y8tl
Elevation: 890 to 2,860 feet
Mean annual precipitation: 11 to 22 inches
Mean annual air temperature: 64 to 65 degrees F
Frost-free period: 320 to 365 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Hanford and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hanford

Setting

Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

A - 0 to 12 inches: sandy loam
C - 12 to 60 inches: fine sandy loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: R019XG911CA - Loamy Fan
Hydric soil rating: No

Minor Components

Greenfield, sandy loam

Percent of map unit: 10 percent
Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Tujunga, loamy sand

Percent of map unit: 5 percent
Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Data Source Information

Soil Survey Area: San Bernardino County Southwestern Part, California
Survey Area Data: Version 15, Aug 30, 2023

APPENDIX B

Laboratory Test Programs

Laboratory tests were conducted on representative soils for the purpose of classification and for the determination of the physical properties and engineering characteristics. The number and selection of the types of testing for a given study are based on the geotechnical conditions of the site. A summary of the various laboratory tests performed for the project is presented below.

Moisture Content and Dry Density (D2937):

Data obtained from these tests, performed on undisturbed samples are used to aid in the classification and correlation of the soils and to provide qualitative information regarding soil strength and compressibility.

Direct Shear (D3080):

Data obtained from this test performed at increased and field moisture conditions on relatively remolded soil sample is used to evaluate soil shear strengths. Samples contained in brass sampler rings, placed directly on test apparatus are sheared at a constant strain rate of 0.002 inch per minute under saturated conditions and under varying loads appropriate to represent anticipated structural loadings. Shearing deformations are recorded to failure. Peak and/or residual shear strengths are obtained from the measured shearing load versus deflection curve. Test results, plotted on graphical form, are presented on Plate B-1 of this section.

Consolidation (D2835):

Drive-tube samples are tested at their field moisture contents and at increased moisture conditions since the soils may become saturated during lifetime use of the planned structure.

Data obtained from this test performed on relatively undisturbed and/or remolded samples, were used to evaluate the consolidation characteristics of foundation soils under anticipated foundation loadings. Preparation for this test involved trimming the sample, placing it in a one-inch-high brass ring, and loading it into the test apparatus which contained porous stones to accommodate drainage during testing. Normal axial loads are applied at a load increment ratio, successive loads being generally twice the preceding.

Soil samples are usually under light normal load conditions to accommodate seating of the apparatus. Samples were tested at the field moisture conditions at a predetermined normal load. Potentially moisture sensitive soil typically demonstrated significant volume change with the introduction of free water. The results of the consolidation tests are presented in graphical forms on Plate B-2.

Laboratory Test Results

Table I: Max. Density/Optimum Moisture Content (ASTM D1557)

Sample Location @ Depth, feet	Max. Dry Density, pcf	Optimum Moisture Content, %
B-1 @ 0-3 SAND – GP-SP Tannish light brown, gravel sand mixture, fine to coarse with trace silts, rock fragments, rocks, and cobbles	133	8.0

Table III: Direct Shear (ASTM D3080)

Test Boring No. @ Sample Depth, feet	Test Condition	Cohesion, psf	Friction, degrees
B-1 @ 0-3	Remolded to 90%	640	39

Table IV: Consolidation (ASTM D2435)

Boring No., B	Depth, feet	Consolidation prior to saturation, % @ 2 kips	Hydro Collapse, % @ 2 kips	Total Consolidation, % @ 8 kips (saturated)
1 (remolded)	0-3	0.5	0.1	1.8

Table V: Sand Equivalent, SE (ASTM D2419)

Sample Location @ depth, feet	**Sand Equivalent Average, SE**
B-3 @ 0-3.0	55.9
B-6 @ 0-3.0	46.7

Table VI: Sieve Analysis (ASTM D422)

SAMPLE: B-6 @ 0-3 feet

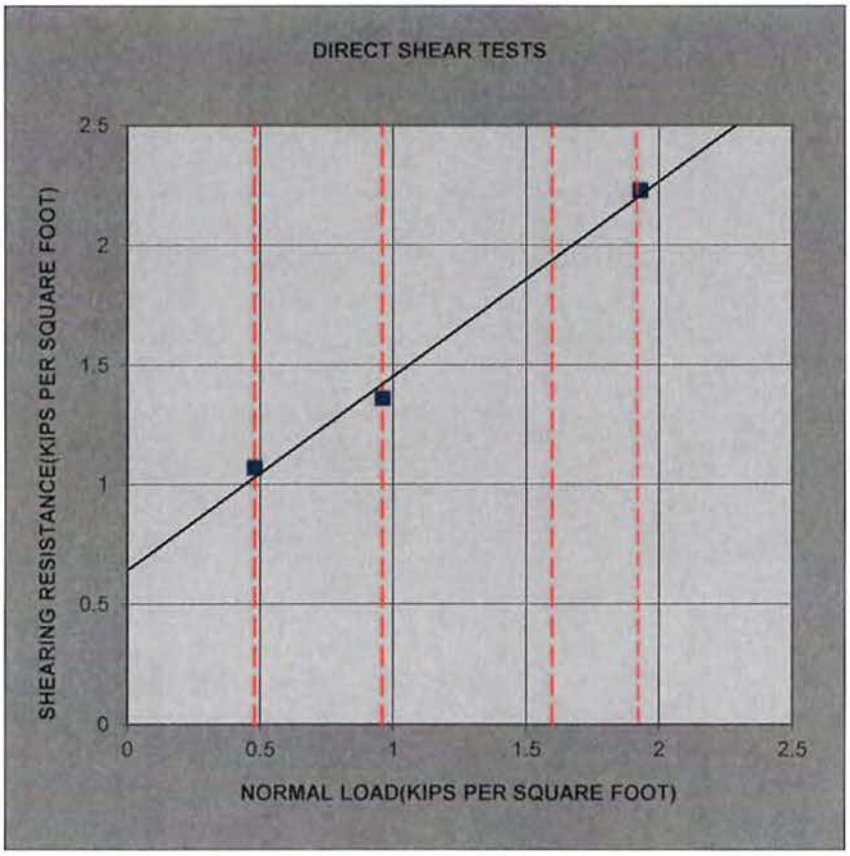
Grain Size	% Retained
Gravels	33
Medium to Coarse	37
Fines	18
Silts	12

Table VII: Soils' Chemical Test Results at Sample Location B-1 @ 0-3 feet

Sample	Method	Result	Units	Remarks
pH	EPA 9040 B	7.93	units	Not corrosive
Resistivity	SM 2510B	3,640	ohms-cm	Moderately corrosive
Chloride	EPA 300.0	29	mg/kg	Not corrosive
Sulfate	EPA 300.0	82	mg/kg	Not corrosive

Table VIII: Soils' Density Correlation to SPT Blow Counts

Density/Consistency		1" Soil Tube -- Blows Per Foot			Standard Penetration Blows Per Foot
Granular	Cohesive	Sand and Gravel	Silt	Clay	
Very Loose	Very Soft	0-50	0-50	0-60	0-5
Loose	Soft	50-100	50-180	60-250	5-10
Slightly Compact	Stiff	100-350	180-1000	250-1000	10-20
Compact	Very Stiff	350-525	1000-2000	1000-4000	20-35
Dense	Hard	525-1500	2000-5000	4000-5000	35-70
Very Dense	Very Hard	1500+	5000+	5000+	70+



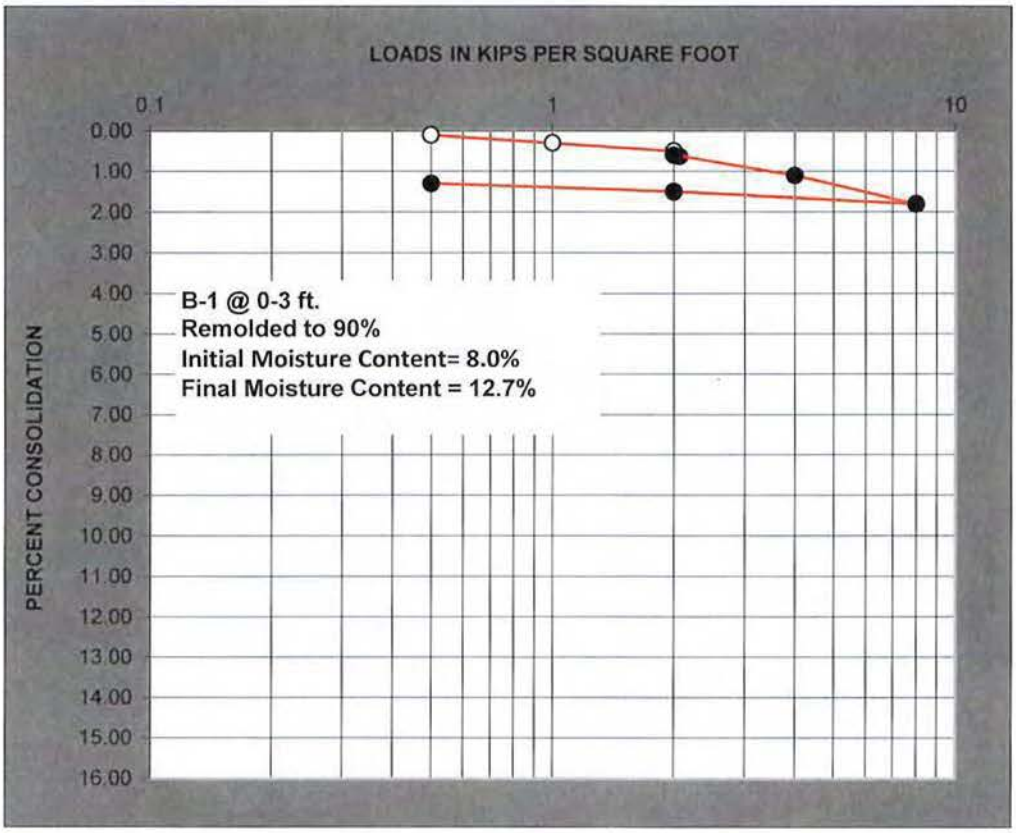
SYMBOL	LOCATION	DEPTH (FT)	TEST CONDITION	COHESION (psf)	FRICTION (degree)
■	B-1	0 to 3	Remolded to 90%	640.10	39.08

Proposed Administrative Office and Maintenance Structures
400 E. 20th Street
Upland, California

PROJECT NO.	24036-F
PLATE	B-1

SOILS SOUTHWEST, INC.
Consulting Foundation Engineers

CONSOLIDATION TESTS



- **WATER PERMITTED TO CONTACT SAMPLE**

	PROJECT	Proposed Adiminstrative Office and Maintenance Structures 400 E. 20th Street		
	PROJECT NO.	24036-F	PLATE	B-2

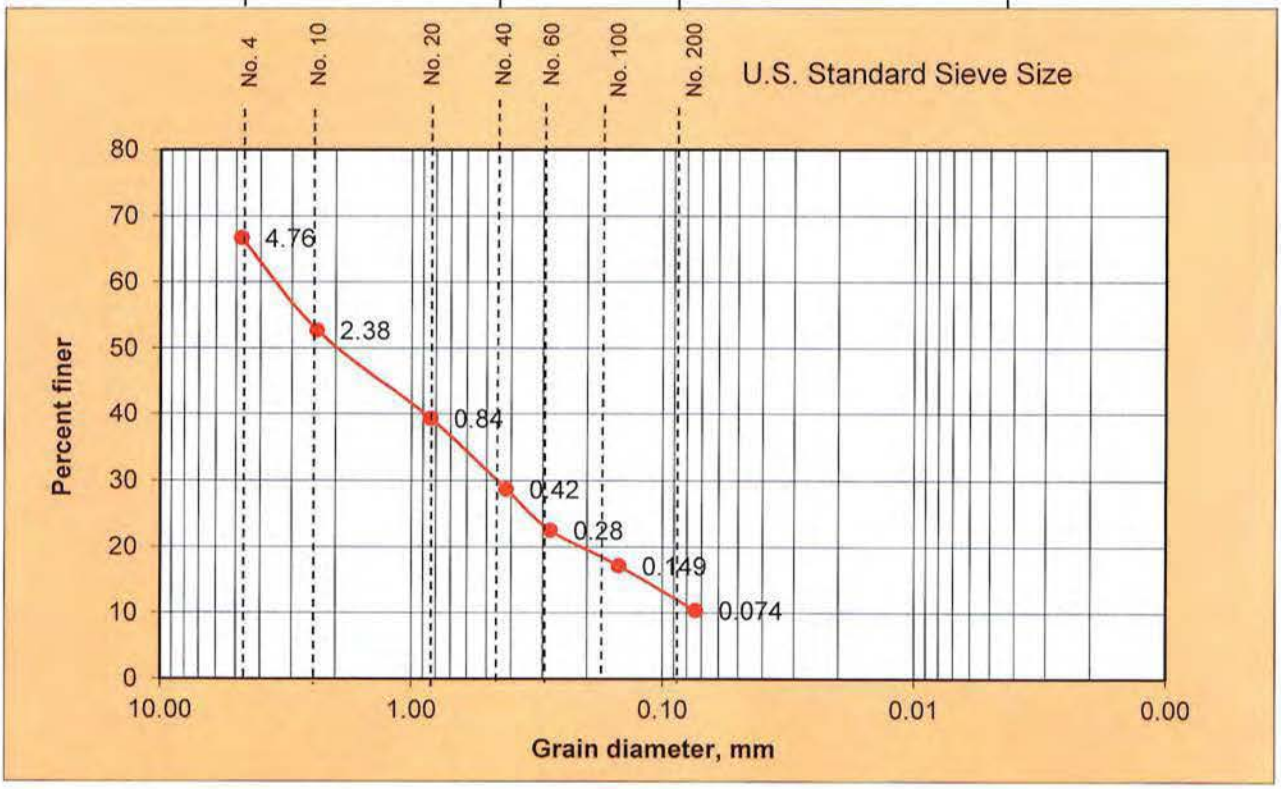
SOILS SOUTHWEST INC.
Consulting Foundation Engineers

GRAIN SIZE DISTRIBUTION

Project: San Antonio Water District HDQ **Job #** 24036-F
Location: 400 E. 20th Street, Upland **Boring No:** B-6/P2@0-3' **Sample No:** 1
Description of Soil: GP-SP
Date of Sample: 8/9/2024
Tested By: JG **Date of Testing:** 8/16/2024

Sieve No.	Sieve Openings in mm	Percent Finer	Grain Size	% Retained
4	4.76	66.74	Gravel	33
10	2.38	52.74	Med. to Crs	37
20	0.84	39.34	Fines	18
40	0.42	28.74	Silts	12
60	0.28	22.54		
100	0.149	17.20		
200	0.074	10.44		

Gravel	Sand			
	Coarse to Medium	Fine	Silt	Clay



Visual Soil Description : GRAVEL/SAND mixture with trace silts, fine to coarse with rock fragments, rocks, and cobbles

Soil Classification: GP-SP

System: USC

SOILS SOUTHWEST INC.
Consulting Foundation Engineers

SAND EQUIVALENT TEST

Test Date: August 16,2024

Project No.: 24036-F/PV

Job Name: San Antonio Water District Headquarters
400 E. 20th Street
Upland

Sample Location: B-6/PV-2 @ 0-3ft

Sample by: JF Tested by: JG

LABORATORY DATA

SAMPLE NO.	1	2	3	4
TIME START	6:13	6:18	6:23	
TIME SOAK (10 min.)	6:23	6:28	6:33	
TIME AT LEVEL 15ML	6:25	6:30	6:35	
TIME of READING (20-min)	6:45	6:50	6:55	
FINE, ML	5.8	5.6	5.7	
COARSE, ML	2.8	2.6	2.6	
SE = 100x (coarse/fine)	48.27	46.42	45.61	
SE Average	46.76			

SAND EQUIVALENT TEST

Test Date: August 15,2024

Project No.: 24036-F/PV

Job Name: San Antonio Water District Headquarters
400 E. 20th Street
Upland

Sample Location: B-3/PV-1 @ 0-3ft

Sample by: JF Tested by: JG

LABORATORY DATA

SAMPLE NO.	1	2	3	4
TIME START	1:52	1:57	2:02	
TIME SOAK (10 min.)	2:02	2:07	2:12	
TIME AT LEVEL 15ML	2:04	2:09	2:14	
TIME of READING (20-min)	2:24	2:29	2:34	
FINE, ML	6.0	5.8	5.7	
COARSE, ML	3.6	3.0	3.2	
SE = 100x (coarse/fine)	60	51.7	56.1	
SE Average	55.9			

A & R Laboratories, Inc.

1650 S. GROVE AVE., SUITE C
ONTARIO, CA 91761
909-781-6335
www.arlaboratories.com office@arlaboratories.com

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CASE NARRATIVE

Authorized Signature Name / Title (print)	Ken Zheng, President
Signature / Date	Ken Zheng, President 08/19/2024 18:03:02
Laboratory Job No. (Certificate of Analysis No.)	2408-00123
Project Name / No.	24036-F SAN ANTONIO WTR DIST. / 400 E. 20th ST., UPLAND
Dates Sampled (from/to)	08/14/24 To 08/14/24
Dates Received (from/to)	08/15/24 To 08/15/24
Dates Reported (from/to)	08/19/24 To 8/19/2024
Chains of Custody Received	Yes

Comments:

Subcontracting

Inorganic Analyses

No analyses sub-contracted

Other Analyses

No analyses sub-contracted

Sample Condition(s)

All samples intact

Positive Results (Organic Compounds)

None

The data and information on this, and other accompanying documents, represent only the sample(s) analyzed and is rendered upon condition that it is not to be reproduced, wholly or in part, for advertising or other purposes without approval from the laboratory.

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CERTIFICATE OF ANALYSIS

2408-00123

SOILS SOUTHWEST INC
MOLOY GUPTA
897 VIA LATA SUITE N
COLTON, CA 92324

Date Reported	08/19/24
Date Received	08/15/24
Invoice No.	2349
Cust #	S192
Permit Number	
Customer P.O.	

Project: 24036-F SAN ANTONIO WTR DIST. / 400 E. 20th ST., UPLAND

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 001 **B-1@0-3ft**					Date & Time Sampled:		08/14/24 @	10:00
Sample Matrix: **Soil**								
pH@25C-as Dissolved in Wtr	**7.93**		units	EPA 9040 B	1.0	0	08/15/24	DV
Resistivity	**3640**		ohms/cm	SM 2510B	1.0	1.0	08/15/24	DV
Chloride	**29**		mg/Kg	EPA 300.0 (1993 Rev 2.:	1.0	5.0	08/18/24	TLB
Sulfate	**82**		mg/Kg	EPA 300.0 (1993 Rev 2.:	1.0	5.0	08/18/24	TLB

Respectfully Submitted: Ken Zheng

Ken Zheng - Lab Director

QUALIFIERS

B = Detected in the associated Method Blank at a concentration above the routine RL.
B1 = BOD dilution water is over specifications . The reported result may be biased high.
D = Surrogate recoveries are not calculated due to sample dilution.
E = Estimated value; Value exceeds calibration level of instrument.
H = Analyte was prepared and/or analyzed outside of the analytical method holding time
I = Matrix Interference.
J = Analyte concentration detected between RL and MDL.
Q = One or more quality control criteria did not meet specifications. See Comments for further explanation.
S = Customer provided specification limit exceeded.

ABBREVIATIONS

DF = Dilution Factor
RL = Reporting Limit, Adjusted by DF
MDL = Method Detection Limit, Adjusted by DF
Qual = Qualifier
Tech = Technician

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USDA-EPA-NIOSH Testing Food Sanitation Consulting Chemical and Microbiological Analyses and Research

ARL

A & R Laboratories
1650 S. Grove Ave., Ste C, Ontario, CA 91761
Tel: 951-779-0310 / 909-781-6335 Fax: 951-779-0344
E-mail: office@arlaboratories.com

CHAIN OF CUSTODY

A & R Work Order #: 2408-123

Page 1 of 1

Client Name: Soils Southwest, Inc.
E-mail: soilssouthwest@aol.com
Address: 897 Via Lata, Suite N, Colton CA
Report Attention: Moloy G. | Phone # 909-370-0474 | Fax: # | Sampled By: John Flippin
Project No./ Name: 24036-F | Project Site: 400 East 20th Street, Upland

☒ Chilled
☒ Intact
☐ Seal

Turn Around Time Requested: ☐ Rush 8 12 24 48 Hours ☑ Normal

Lab # (Lab use)	Client Sample ID	Sample Collection Date	Sample Collection Time	Matrix Type	Sample Preserve	No., type* & size of container	EPA8260B (VOCs & Oxygenates)	EPA8260B(BTEX & Oxygenates)	8260B / 8015 (Gasoline)	8015 (Diesel)	EPA8081A (Organochlorine Pesticides)	EPA 8082 (PCBs)	EPA 8015M (Carbon Chain C4-C40)	EPA 6010B/7000 (CAM 17 Metals)	Micro: Plate Cnt., Coliform, E-Coli	Sulfate	Chloride	pH	Resistivity			Remarks
1	B-1 @ 0-3 ft	8/14/24	10:00 AM	Soil	Jar	4 ounce										✓	✓	✓	✓			

L San Antonio Water District

Relinquished By	Company	Date	Time	Received By	Company	Date	Time
[signature]	SSW	8/15	9:23	[signature]		8/15/24	9:23
Relinquished By	Company	Date	Time	Received By	Company	Date	Time

Note: Samples are discarded 30 days after results are reported unless other arrangements are made.

Matrix Code: DW=Drinking Water; GW=Ground Water; WW=Waste Water; SD=Solid Waste; SL=Sludge; SS=Soil/Sediment; AR=Air; PP=Pure Product

Preservative Code: IC=Ice; HC=HCl; HN=HNO_3; SH=NaOH; ST=$Na_2S_2O_3$; HS=H_2SO_4

* Sample Container Types: T=Tedlar Air Bag; G=Glass Container; ST= Steel Tube; B= Brass Tube; P=Plastic Bottle; V=VOA Vial; E= EnCore

Sample Acceptance Checklist

CLIENT: Soils Southwest WORK ORDER NUMBER: 2408-123

Temperature:(Criteria:0.0°C-6.0°C)

Sample Temp. (°C) 5.6c ID#: 22-0030

- [ ] Sample(s) outside temprature criteria: PM contacted by :
- [ ] Sample(s) outside temprature criteria, but received on ice/chilled on same day of sampling.
- [ ] Sample(s) received at ambient temprature; placed on ice for transport by courier.

CUSTODY SEAL:

Cooler	[ ]	Present and Intact	[ ]	Present and Not Intact	[X]	Not Present
Sample(s)	[ ]	Present and Intact	[ ]	Present and Not Intact	[X]	Not Present

Sample Condition:	Yes	No	N/A
Was a COC received	X		
Were sample IDs present?	X		
Were sampling dates & times present?	X		
Was a relingquished signature present?	X		
Were the tests required clearly indicated?	X		
Were all samples sealed in plastic bags?		X	Soil
Did all bottle labels agree with COC? (ID, dates and times)	X		
Were correct containers used for the tests required?	X		
Was a sufficient amount of samples sent for tests indicated?	X		
Was there headspace in VOA vials?			X
Were the containers labeled with correct preservatives?			X

Explanations/Comments:

Notification:

For discrepancies, how was the Project Manager notified?

Verbal: PM Initials: _____ Data/Time: _____

Email: Send to: _____ Data/Time: _____

Project Manager's response:

Completed By: [signature] Date: 8/15/24

A R Laboratories
1650 S. Grove Ave., Suite C, Ontario, CA 91761
PH: 909-781-6335
Email: office@arlaboratories.com

ANAHEIM TEST LAB, INC

196 Technology Drive, Unit D
Irvine, CA 92618
Phone (949) 336-6544

TO:

SOILS SOUTHWEST, INC.
897 VIA LATA, SUITE N
COLTON, CA. 92324

DATE: 8/26/2024

P.O. NO.: Verbal

LAB NO.: C-8132

SPECIFICATION: CA 301

MATERIAL: Brown, Silty Sand w. Gravel

Project No.: 24036-F
Project: San Antonio Water District HDQ
400 East 20th St, Upland, CA
Sample ID: B-6/PV-2 @ 0-3'
Sample Date: 8/16/2024

ANALYTICAL REPORT
"R" VALUE

BY EXUDATION	BY EXPANSION
75	N/A

RESPECTFULLY SUBMITTED

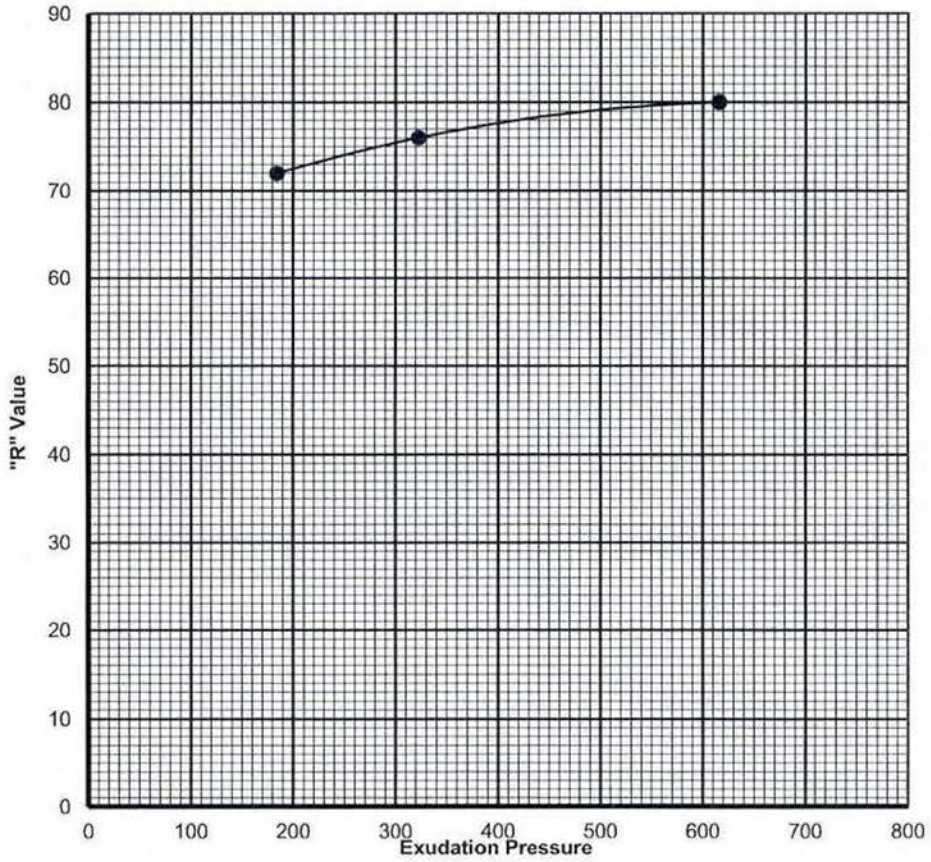
WES BRIDGER LAB MANAGER

"R" VALUE CA 301

Client: Soils Southwest, Inc. **ATL No.:** C 8132 **Date:** 8/26/2024
Client Reference No.: 24036-F
Sample: B-6/PV-2 @ 0-3' **Soil Type:** Brown, Silty Sand w. Gravel

TEST SPECIMEN		A	B	C	D
Compactor Air Pressure	psi	350	350	350	
Initial Moisture Content	%	2.0	2.0	2.0	
Moisture at Compaction	%	7.6	7.1	7.3	
Briquette Height	in.	2.45	2.46	2.49	
Dry Density	pcf	135.5	134.2	134.8	
EXUDATION PRESSURE	psi	184	616	322	
EXPANSION PRESSURE	psf	0	0	0	
Ph at 1000 pounds	psi	20	13	16	
Ph at 2000 pounds	psi	35	22	28	
Displacement	turns	3.45	3.86	3.81	
"R" Value		72	80	76	
CORRECTED "R" VALUE		72	80	76	

Final "R" Value	
BY EXUDATION: @ 300 psi	**75**
BY EXPANSION: TI = 5.0	**N/A**

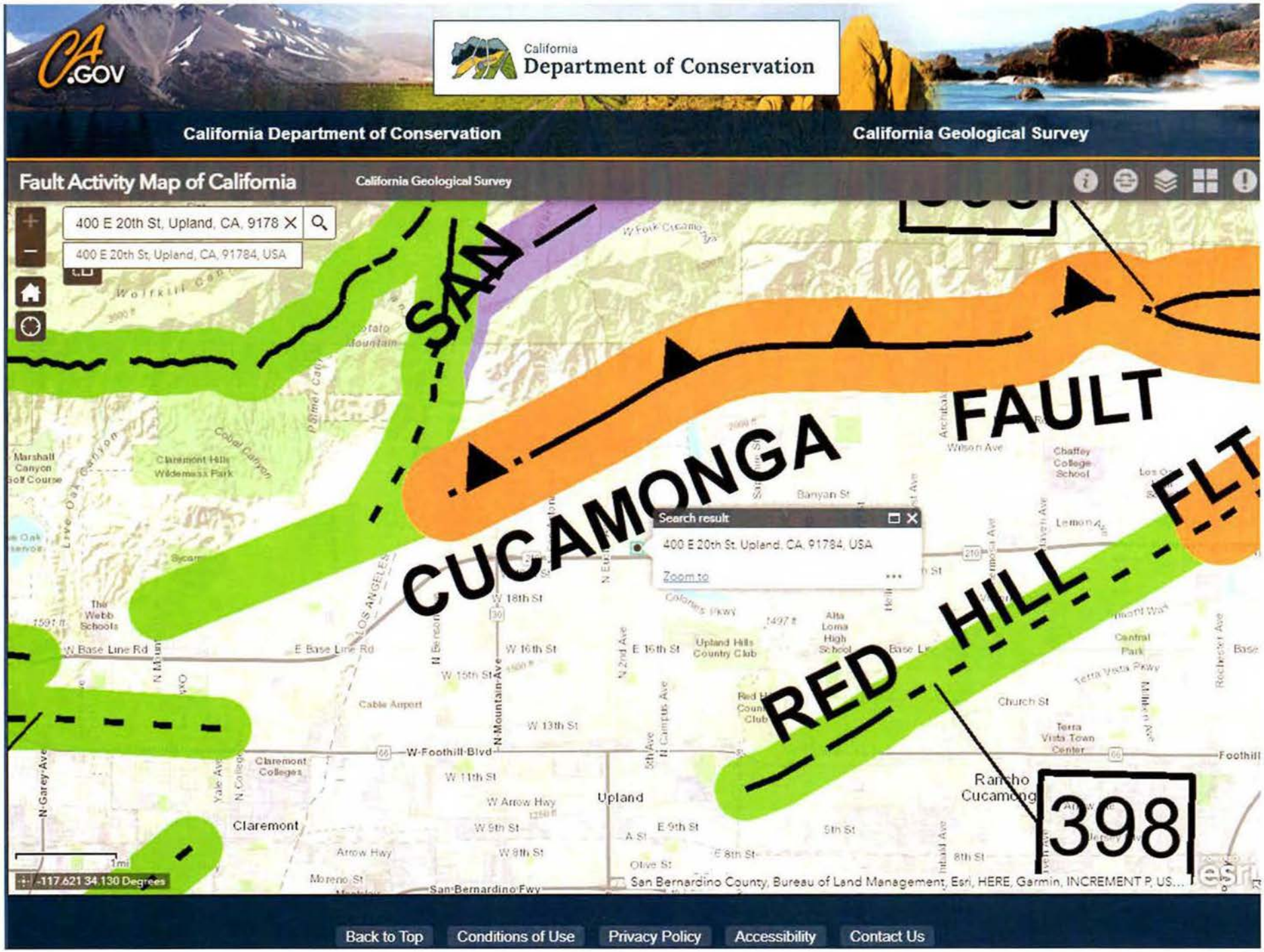


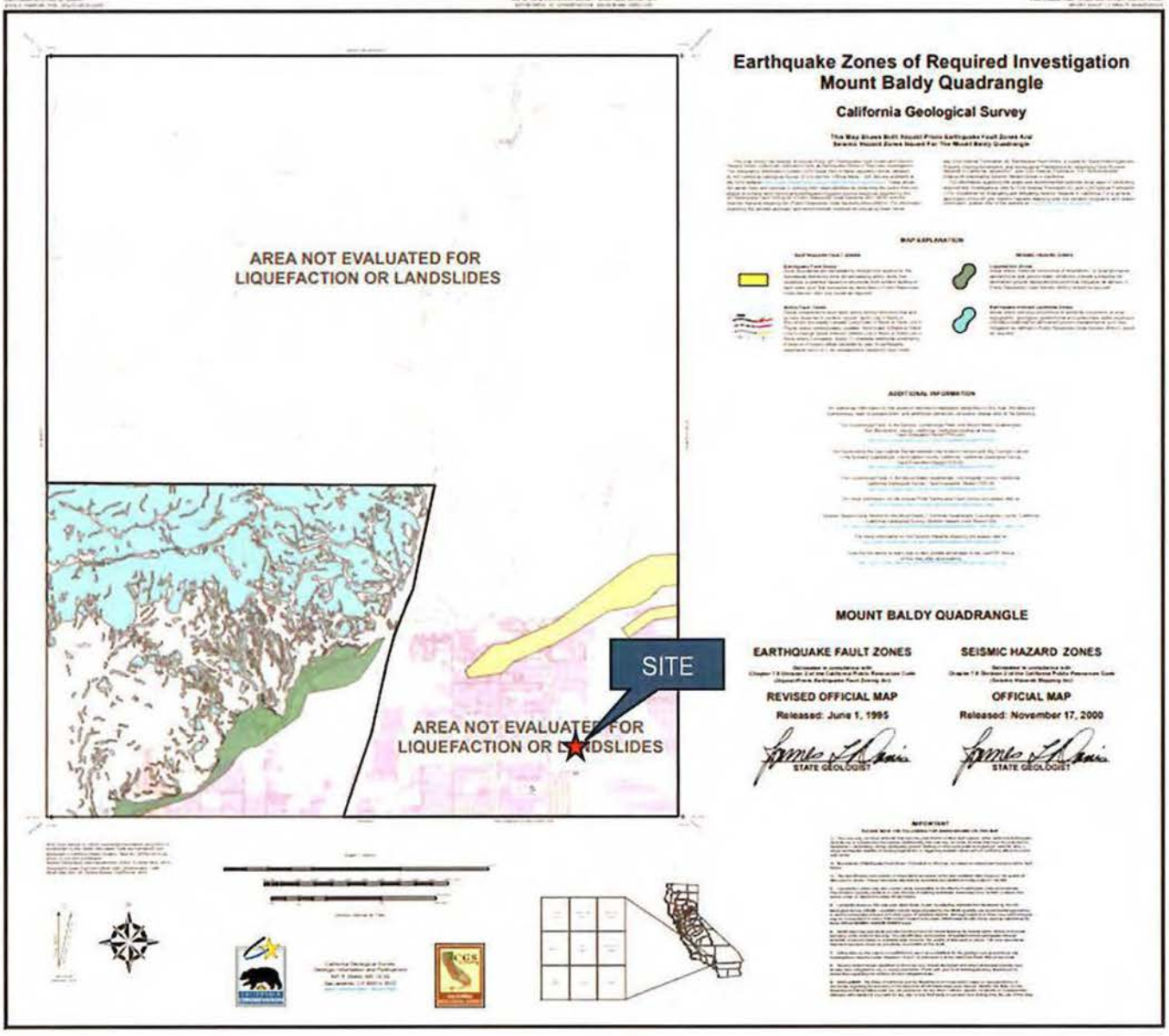
APPENDIX C

Supplemental Seismic Design Parameters

&

FEMA National Flood Hazard Layer Map


CA.GOV
California
Department of Conservation
California Department of Conservation
California Geological Survey
Fault Activity Map of California
California Geological Survey
400 E 20th St, Upland, CA, 9178
400 E 20th St, Upland, CA, 91784, USA
SAN
CUCAMONGA
FAULT
RED HILL FLT
Search result
400 E 20th St, Upland, CA, 91784, USA
Zoom to
Marshall Canyon Golf Course
Claremont Hills Wilderness Park
Live Oak Canyon
Cobal Canyon
Wolfskill Canyon
Potato Mountain
Wilson Ave
Chaffey College School
Banyan St
Lemon Ave
W 18th St
W 16th St
E 16th St
W 15th St
W 13th St
W Base Line Rd
E Base Line Rd
N Mountain Ave
N 2nd Ave
N Campus Ave
Upland Hills Country Club
Alta Loma High School
Central Park
Terra Vista Town Center
Church St
Cable Airport
W Foothill Blvd
Foothill
Claremont Colleges
Claremont
W 11th St
W Arrow Hwy
Arrow Hwy
Upland
E 9th St
W 9th St
W 8th St
E 8th St
5th St
8th St
Olive St
Moreno St
San Bernardino Fwy
Rancho Cucamonga
398
1mi
-117.621 34.130 Degrees
San Bernardino County, Bureau of Land Management, Esri, HERE, Garmin, INCREMENT P, US...
esri
Back to Top
Conditions of Use
Privacy Policy
Accessibility
Contact Us


Earthquake Zones of Required Investigation
Mount Baldy Quadrangle
California Geological Survey
AREA NOT EVALUATED FOR
LIQUEFACTION OR LANDSLIDES
SITE
AREA NOT EVALUATED FOR
LIQUEFACTION OR LANDSLIDES
MOUNT BALDY QUADRANGLE
EARTHQUAKE FAULT ZONES
REVISED OFFICIAL MAP
Released: June 1, 1995
STATE GEOLOGIST
SEISMIC HAZARD ZONES
OFFICIAL MAP
Released: November 17, 2000
STATE GEOLOGIST

ASCE Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: III
Soil Class: D - Stiff Soil

Latitude: 34.135692
Longitude: -117.64504
Elevation: 1649.1604629371752 ft (NAVD 88)

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

Seismic

Site Soil Class: D - Stiff Soil

Results:

S_S :	1.766	S_{D1} :	N/A
S_1 :	0.658	T_L :	12
F_a :	1	PGA :	0.753
F_v :	N/A	PGA_M :	0.829
S_{MS} :	1.766	F_{PGA} :	1.1
S_{M1} :	N/A	I_e :	1.25
S_{DS} :	1.177	C_v :	1.453

Ground motion hazard analysis may be required. See ASCE/SEI 7-16 Section 11.4.8.

Data Accessed: Mon Jul 22 2024

Date Source: USGS Seismic Design Maps

U.S. Geological Survey - Earthquake Hazards Program

2008 National Seismic Hazard Maps - Source Parameters

New Search

Distance in Miles	Name	State	Pref Slip Rate (mm/yr)	Dip (degrees)	Dip Dir	Slip Sense	Rupture Top (km)	Rupture Bottom (km)	Length (km)
1.30	Cucamonga	CA	5	45	N	thrust	0	8	28
3.02	San Jose	CA	0.5	74	NW	strike slip	0	15	20
5.56	Sierra Madre	CA	2	53	N	reverse	0	14	57
5.56	Sierra Madre Connected	CA	2	51		reverse	0	14	76
9.14	Chino, alt 2	CA	1	65	SW	strike slip	0	14	29
9.22	Chino, alt 1	CA	1	50	SW	strike slip	0	9	24
11.28	San Jacinto;SBV+SJV+A	CA	n/a	90	V	strike slip	0	16	134
11.28	San Jacinto;SBV+SJV	CA	n/a	90	V	strike slip	0	16	88
11.28	San Jacinto;SBV+SJV+A+C	CA	n/a	90	V	strike slip	0	17	181
11.28	San Jacinto;SBV+SJV+A+CC	CA	n/a	90	V	strike slip	0	16	181
11.28	San Jacinto;SBV	CA	6	90	V	strike slip	0	16	45
11.28	San Jacinto;SBV+SJV+A+CC+B+SM	CA	n/a	90	V	strike slip	0.1	15	241
11.28	San Jacinto;SBV+SJV+A+CC+B	CA	n/a	90	V	strike slip	0.1	15	215
13.53	S. San Andreas;BB+NM+SM+NSB+SSB+BG+CO	CA	n/a	85		strike slip	0.1	13	390
13.53	S. San Andreas;CH+CC+BB+NM+SM+NSB+SSB+BG+CO	CA	n/a	86		strike slip	0.1	13	512
13.53	S. San Andreas;NSB+SSB+BG+CO	CA	n/a	79		strike slip	0.2	12	206
13.53	S. San Andreas;BB+NM+SM+NSB	CA	n/a	90	V	strike slip	0	14	220

U.S. Geological Survey - Earthquake Hazards Program

2008 National Seismic Hazard Maps - Source Parameters

New Search

Fault Name	State
Cucamonga	**California**

GEOMETRY	
Dip (degrees)	45
Dip direction	N
Sense of slip	thrust
Rupture top (km)	0
Rupture bottom (km)	8
Rake (degrees)	90
Length (km)	28

MODEL VALUES		
Slip Rate	5	
Probability of activity	1	
	ELLSWORTH	HANKS
Minimum magnitude	6.5	6.5
Maximum magnitude	6.70	6.50
b-value	0.8	0.8

Fault Model	Deformation Model	Char Rate[1]	GR-a-value[1]	Weight
Stitched	2.1	3.31e-03 / 6.61e-03	2.648 / NA	0.50
UnStitched	2.1	3.31e-03 / 6.61e-03	2.648 / NA	0.50
Stitched	2.4	3.31e-03 / 6.61e-03	2.648 / NA	0.50
UnStitched	2.4	3.31e-03 / 6.61e-03	2.648 / NA	0.50

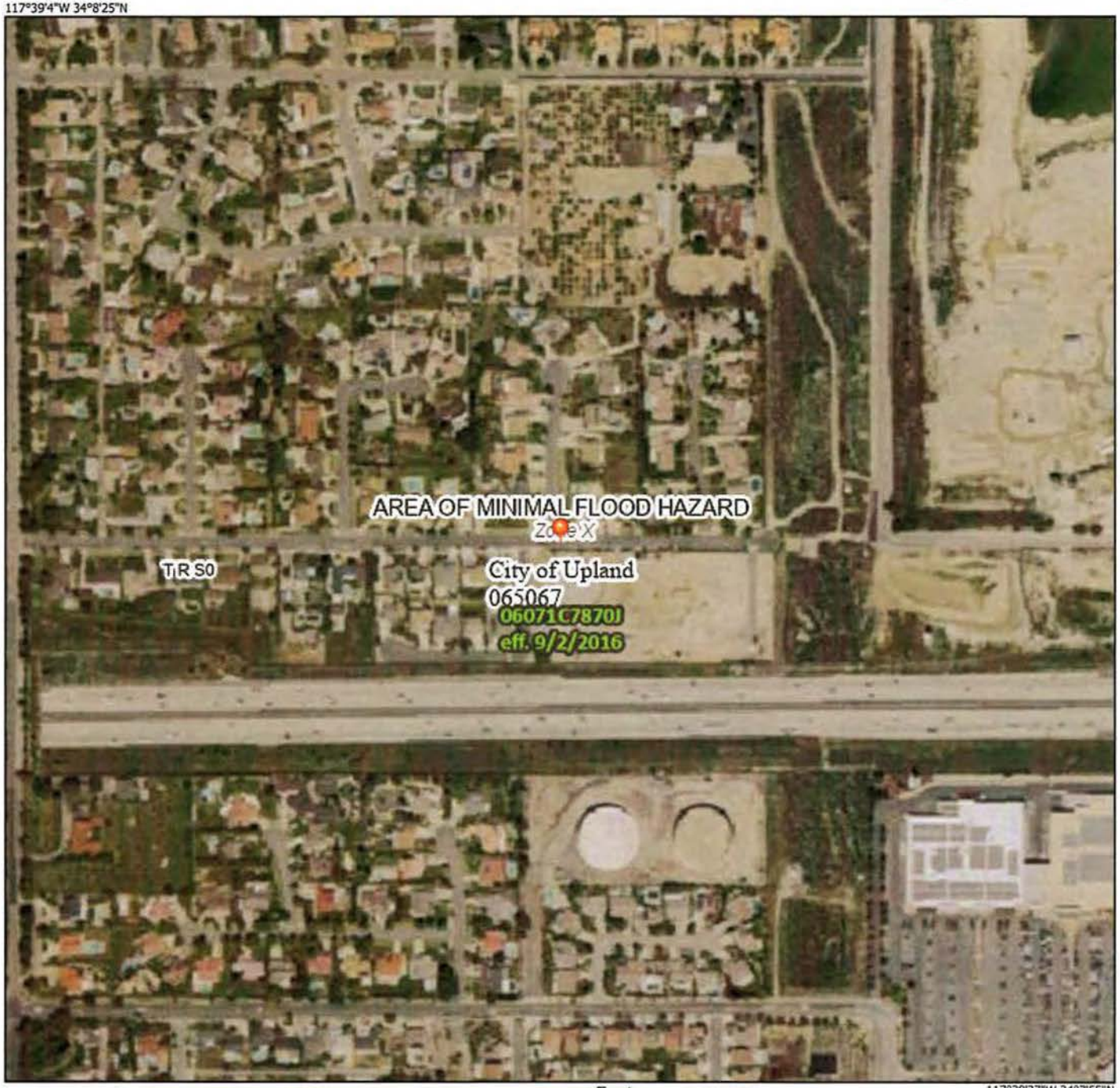
[1] 1st Value is based on Ellsworth relation and 2nd value is based on Hanks and Bakun relation

Comments

Slip rate based on cumulative vertical displacement across three strands reported by Morton and Matti (1987, 1991).

National Flood Hazard Layer FIRMette

FEMA



Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 7/22/2024 at 3:06 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

APPENDIX D

Field Infiltration Test Data
Porchet Method Calculation Summary

Conversion Table (Porchet Method)
San Antonio Water District Headquarters
400 E. 20th Street, Upland
Project No. 24036-BMP

Test N no.	Test Hole Depth (inches) D_T	Time Interval Δ_T	Initial Depth (inches) D_O (in)	Final Depth (inches) D_f (in)	Initial Water Height (inches) $H_O=D_T-D_O$	Final Water Height (inches) $H_f = D_T-D_f$	Change Height/Time $\Delta H/\Delta D= H_O-H_f$	Average Head Height/Time $Havg = (H_O+H_f)/2$
P-1	36	10	12	35.5	24	0.5	23.5	12.25
P-2	60	10	36	56.5	24	3.5	20.5	13.75
P-3	Test at required depth could not be performed							
P-4	Test at required depth could not be performed							

	Observed Infiltration Rate (It) = ΔH60r/Δt (r+2Havg)		
	A	B	C
	ΔH60r	Δt (r+2H_{avg})	A/B= inch/hr
P-1	5640	285	**19.79**
P-2	4920	315	**15.62**
P-3			
P-4			

Legend

Δ H/ΔD = Observed Field Rate

H_O = inches of water filled from bottom

D_O = initial height of water (inches) from bottom

D_f = final heigh of water (inches) from bottom

Columns A-B-C : Porchet Conversion Calculations

Column C: Observed Rate following Porchet Conversion

D_t = depth of test hole bottom (inches)

Percolation Test Data Sheet

Project: SAN ANTONIO WATER DISTRICT HDQ - UPLAND			Project No. 24036	
Test Hole No:	P-1	Tested By: JG	Date: 8-9-24	
Depth of Test Hole, D_T	36	USCS Soil Classification		
Test Hole Dimensions (inches)			Length	Width
Diameter (if round)=	8.0 in.	Sides (if rectangular)=		

Sandy Soil Criteria Test *

Trial No.	Start Time	Stop Time	Δt Time Interval (min)	D_o Initial Depth to Water (in.)	D_f Final Depth to Water (in.)	ΔD Change in Water Level (in.)	Greater Than or Equal to 6.0 Inches??? (Y/N)
1	10:38	10:45	25	12	36	24	Y
2	10:45	10:55	25	12	36	24	Y

* If two consective measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fiill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25."

Trial No.	Start Time	Stop Time	Δt Time Interval (min)	D_o Initial Depth to Water (in.)	D_f Final Depth to Water (in.)	ΔD Change in Water Level (in.)	ΔT/ΔD Percolation Rate (min./in.)
1	10:56	11:06	10	12	36	24	0.42
2	11:07	11:17	10	12	36	24	0.42
3	11:18	11:28	10	12	36	24	0.42
4	11:29	11:39	10	12	36	24	0.42
5	11:40	11:50	10	12	35.5	23.5	0.43
6	11:51	12:01	10	12	35.5	23.5	0.43
7	12:01	12:11	10	12	35.5	23.5	0.43
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							

Comments

Percolation Test Data Sheet

Project: SAN ANTONIO WATER DISTRICT HDQ - UPLAND				Project No. 24036	
Test Hole No:	P-2		Tested By: JG		Date: 8-9-24
Depth of Test Hole, D_T	60		USCS Soil Classification		
Test Hole Dimensions (inches)				Length	Width
Diameter (if round)=	8.0 in.	Sides (if rectangular)=			

Sandy Soil Criteria Test *

Trial No.	Start Time	Stop Time	Δt Time Interval (min)	D_o Initial Depth to Water (in.)	D_f Final Depth to Water (in.)	ΔD Change in Water Level (in.)	Greater Than or Equal to 6.0 inches??? (Y/N)
1	10:49	11:04	25	36	60	24	Y
2	11:05	11:20	25	36	60	24	Y

* If two consective measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fiill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25."

Trial No.	Start Time	Stop Time	Δt Time Interval (min)	D_o Initial Depth to Water (in.)	D_f Final Depth to Water (in.)	ΔD Change in Water Level (in.)	ΔT/ΔD Percolation Rate (min./in.)
1	11:21	11:31	10	36	57	21	0.48
2	11:32	11:42	10	36	57	21	0.48
3	11:43	11:52	10	36	57	21	0.48
4	11:54	12:04	10	36	57	21	0.48
5	12:07	12:17	10	36	56.5	20.5	0.49
6	12:18	12:28	10	36	56.5	20.5	0.49
7	12:29	12:39	10	36	56.5	20.5	0.49
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							

Comments

Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 1)

1 Remaining LID DCV not met by site design BMP (ft^3): *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item19*			
BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP) - Use additional forms for more BMPs*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix C of the TGD for WQMP for minimum requirements for assessment methods*	19.79	15.62	
3 Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*			
4 Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*			
5 Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*			
6 Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*			
7 Ponding Depth (ft) *d_{BMP} = Minimum of (1/12*Item 4*Item 5) or Item 6*			
8 Infiltrating surface area, *SA_{BMP}* (ft^2) *the lesser of the area needed for infiltration of full DCV or minimum space requirements from Table 5.7 of the TGD for WQMP*			
9 Amended soil depth, *d_{media}* (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*			
10 Amended soil porosity			
11 Gravel depth, *d_{media}* (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*			
12 Gravel porosity			
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*			
14 Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*			
15 Underground Retention Volume (ft^3) *Volume determined using manufacturer's specifications and calculations*			
16 Total Retention Volume from LID Infiltration BMPs: *(Sum of Items 14 and 15 for all infiltration BMP included in plan)*			
17 Fraction of DCV achieved with infiltration BMP: % *Retention% = Item 16 / Form 4.2-1 Item 7*			
18 Is full LID DCV retained onsite with combination of hydrologic source control and LID retention/infiltration BMPs? Yes ☐ No ☐ *If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the applicable category of development and repeat all above calculations.*			

PROFESSIONAL LIMITATIONS

Our investigation was performed using the degree of care and skill ordinarily exercised, under similar circumstances by other reputable geotechnical engineers practicing in these general or similar localities. No other warranty, expressed or implied, is made as to the conclusions and professional advice included in this report.

The investigations are based on soil samples only, consequently the recommendations provided shall be considered 'preliminary'. The samples taken and used for testing and the observations made are believed representative of site conditions; however, soil and geologic conditions can vary significantly between boring. As in most major projects, conditions revealed by excavations may vary with preliminary findings. If this occurs, the changed conditions must be evaluated by the project geotechnical engineer and designs adjusted as required or alternate design recommended.

The report is issued with the understanding that it is the responsibility of the owner, or of his representative, to ensure that the information and recommendations contained herein are brought to the attention of the project architect and engineers. Appropriate recommendations should be incorporated into structural plans. The necessary steps should be taken to see that out such recommendations in field.

The findings of this report are valid as of this present date. However, changes in the conditions of a property can occur with the passage of time, whether they due to natural process or the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur from legislation or broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside of our control. Therefore, this report is subject to review and should be updated after a period of one year.

RECOMMENDED SERVICES

The review of grading plans and specifications, field observations and testing by a geotechnical representative of this office is integral part of the conclusions and recommendations made in this report. If Soils Southwest, Inc. (SSW) is not retained for these services, the Client agrees to assume SSW's responsibility for any potential claims that may arise during and after construction or during the lifetime use of the structure and its appurtenant.

The recommendations supplied should be considered valid and applicable, provided the following conditions, at a minimum, are met:

i. Pre-grade meeting with the contractor, public agency, and the geotechnical engineer,
ii. Excavated bottom inspections and verifications by the greotechnical engineer prior to backfill placement,
iii. Continuous observations and testing during site preparation and structural fill soils placement,
iv. Observation and inspection of footing trenching prior to steel and concrete placement,
v. Subgrade verifications including plumbing trench backfills prior to concrete slab-on-grade placement,
vi. On and off-site utility trench backfill testing and verifications,
vii. Precise-grading plan review, and
viii. Consultations as required during construction or upon request.

In the event that the above conditions are not strictly fulfilled, Soils Southwest, Inc. will assume no responsibility for any structural distresses during the lifetime use of the development planned.

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APPENDIX E

PRELIMINARY WATER QUALITY MANAGEMENT PLAN

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Preliminary Water Quality Management Plan

For:

San Antonio Water Company

WQMP _____

APN 1044-091-22
400 E. 20th Street
Upland, CA 91784

Prepared for:
CEDG Architects
401 E. Columbia Ave.
Pomona, CA 91767
(909) 625-3916
Erik Peterson

Prepared by:
Land Development Design Company, LLC
2313 E. Philadelphia St., Ste. F
Ontario, CA 91761
(909) 930-1466
Kevin Richer

Submittal Date: September 7, 2024

Revision Date: _____

Project Owner's Certification

This Water Quality Management Plan (WQMP) has been prepared for Stewart Development by Land Development Design Company, LLC. The WQMP is intended to comply with the requirements of the San Bernardino County and the NPDES Area-wide Stormwater Program requiring the preparation of a WQMP. The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan and will ensure that this plan is amended as appropriate to reflect up-to-date conditions on the site consistent with San Bernardino County's Municipal Storm Water Management Program and the intent of the NPDES Permit for San Bernardino County and the incorporated cities of San Bernardino County within the Santa Ana Region. Once the undersigned transfers its interest in the property, its successors in interest and the city/county shall be notified of the transfer. The new owner will be informed of its responsibility under this WQMP. A copy of the approved WQMP shall be available on the subject site in perpetuity.

"I certify under a penalty of law that the provisions (implementation, operation, maintenance, and funding) of the WQMP have been accepted and that the plan will be transferred to future successors."

.

Project Data			
Permit/Application Number(s):	TBD	Grading Permit Number(s):	TBD
Tract/Parcel Map Number(s):	Portion of Lot 281 & 282 MB 11/6	Building Permit Number(s):	TBD
CUP, SUP, and/or APN (Specify Lot Numbers if Portions of Tract):			APN 1044-091-22

Owner's Signature			
Owner Name: San Antonio Water			
Title			
Company	San Antonio Water Company		
Address	139 N Euclid Ave, Upland, CA 91786		
Email			
Telephone #	(909) 982-4107		
Signature		Date	

Preparer's Certification

Project Data			
Permit/Application Number(s):	TBD	Grading Permit Number(s):	TBD
Tract/Parcel Map Number(s):	Portion of Lot 281 & 282 MB 11/6	Building Permit Number(s):	TBD
CUP, SUP, and/or APN (Specify Lot Numbers if Portions of Tract):			APN 1044-091-22

"The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control measures in this plan were prepared under my oversight and meet the requirements of Regional Water Quality Control Board Order No. R8-2010-0036."

Engineer: Kevin J. Richer	
Title	Project Engineer
Company	Land Development Design Company, LLC
Address	2313 E. Philadelphia St. Ste. F / Ontario, CA 91761
Email	kevin.richer@lddc.net
Telephone #	(909) 930-1466
Signature	
Date	9/7/24

PE Stamp Below

Table of Contents

Section 1 Discretionary Permits 1-1

Section 2 Project Description 2-1

2.1 Project Information 2-1
2.2 Property Ownership / Management 2-2
2.3 Potential Stormwater Pollutants 2-3
2.4 Water Quality Credits 2-4

Section 3 Site and Watershed Description 3-1

Section 4 Best Management Practices 4-1

4.1 Source Control BMP 4-1
4.1.1 Pollution Prevention 4-1
4.1.2 Preventative LID Site Design Practices 4-6
4.2 Project Performance Criteria 4-7
4.3 Project Conformance Analysis 4-12
4.3.1 Site Design Hydrologic Source Control BMP 4-14
4.3.2 Infiltration BMP 4-16
4.3.3 Harvest and Use BMP 4-18
4.3.4 Biotreatment BMP 4.19
4.3.5 Conformance Summary 4-23
4.3.6 Hydromodification Control BMP 4-24
4.4 Alternative Compliance Plan (if applicable) 4-25

Section 5 Inspection & Maintenance Responsibility Post Construction BMPs 5-1

Section 6 Site Plan and Drainage Plan 6-1

6.1. Site Plan and Drainage Plan 6-1
6.2 Electronic Data Submittal 6-1
6.3 Post Construction 6-1
6.4 Other Supporting Documentation 6-1

Forms

Form 1-1 Project Information 1-1
Form 2.1-1 Description of Proposed Project 2-1
Form 2.2-1 Property Ownership/Management 2-2
Form 2.3-1 Pollutants of Concern 2-3
Form 2.4-1 Water Quality Credits 2-4
Form 3-1 Site Location and Hydrologic Features 3-1
Form 3-2 Hydrologic Characteristics 3-2
Form 3-3 Watershed Description 3-3
Form 4.1-1 Non-Structural Source Control BMP 4-2
Form 4.1-2 Structural Source Control BMP 4-4
Form 4.1-3 Site Design Practices Checklist 4-6
Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume 4-7
Form 4.2-2 Summary of HCOC Assessment 4-8

Form 4.2-3 HCOC Assessment for Runoff Volume 4-9
Form 4.2-4 HCOC Assessment for Time of Concentration 4-10
Form 4.2-5 HCOC Assessment for Peak Runoff 4-11
Form 4.3-1 Infiltration BMP Feasibility 4-13
Form 4.3-2 Site Design Hydrologic Source Control BMP 4-14
Form 4.3-3 Infiltration LID BMP 4-17
Form 4.3-4 Harvest and Use BMP 4-18
Form 4.3-5 Selection and Evaluation of Biotreatment BMP 4-19
Form 4.3-6 Volume Based Biotreatment – Bioretention and Planter Boxes w/Underdrains 4-20
Form 4.3-7 Volume Based Biotreatment- Constructed Wetlands and Extended Detention 4-21
Form 4.3-8 Flow Based Biotreatment 4-22
Form 4.3-9 Conformance Summary and Alternative Compliance Volume Estimate 4-23
Form 4.3-10 Hydromodification Control BMP 4-24
Form 5-1 BMP Inspection and Maintenance 5-1

Section 1 Discretionary Permit(s)

Form 1-1 Project Information

Project Name	San Antonio Water Company				
Project Owner Contact Name:	San Antonio Water Company				
Mailing Address:	139 N Euclid Ave, Upland, CA 91786	E-mail Address:		Telephone:	(909) 982-4107
Permit/Application Number(s):	TBD		Tract/Parcel Map Number(s):	APN 1044-091-22	
Additional Information/ Comments:					
Description of Project:	The project proposes to develop a portion of 4.92 acre site located at 400 E. 20th Street, Upland. The site is bounded to the north by the right-of-way 20th Street and single family tract homes further to the north; to the west by single family tact homes; to the south by the 210 Freeway right-of-way; and to the east by an undeveloped lot. The site is currently partially developed with a water tank and equipment pad located towards the west boundary. The site is primarily pervious with dirt and rock cover. The site has no landscape or natural vegetation. There is a small paved turn-around near the entrance to the lot. The site currently sheet flows from northeast towards southwest. There is a 3' to 6' high slope along the south boundary of the project adjacent to the freeway right-of-way. There is a natural ravine near the southwest corner that discharges into an existing ditch along the northerly freeway right-of-way The project proposes to develop the majority of the site with a office building and maintenance building along with access drives and parking areas. The westerly third of the site will remain undisturbed around the existing water tank and equipment pad. There will be a large landscape area in front of the office building along with landscape buffers along the north, east and south boundaries. The pervious area for this scope of project is higher than normal. The site is divided into 2 drainage areas. DA1 covers the northeasterly quadrant of the site where drainage sheets to a landscaped infiltration basin located to the north of the proposed office building. The office building roof drains are also directed to said infiltration basin. The pervious area for DA1 is approximately 60%. The infiltration basin is designed such that an overflow will discharge at the westerly end of the basin into the undisturbed area. DA2 covers the southerly maintenance building and the easterly drive and parking lot. This area sheets towards curbs and gutters that flow westerly towards a series of catch basin inlets connected to a proposed storm drain. The storm drain will convey flows towards a proposed underground infiltration system located west of the paved area near the south boundary. The access manhole will have a grated manhole cover to allow the system flows to bubble out onto the surface when the system is full. This will only occur during large storms. The infiltration rate is high and will allow smaller storms to be contained within the system and infiltrate rapidly. The overflows will drain towards the existing ravine in the southwest corner of the site. The pervious area for DA2 is approximately 62%. This is due to the large undisturbed area being considered part of the project. These drainage patterns mimic the existing condition and overflows do not exceed pre-developed flow rates Street improvements along 20th Street are existing.				

Provide summary of Conceptual WQMP conditions (if previously submitted and approved). Attach complete copy.	N/A

Section 2 Project Description

2.1 Project Information

This section of the WQMP should provide the information listed below. The information provided for Conceptual/ Preliminary WQMP should give sufficient detail to identify the major proposed site design and LID BMPs and other anticipated water quality features that impact site planning. Final Project WQMP must specifically identify all BMP incorporated into the final site design and provide other detailed information as described herein.

The purpose of this information is to help determine the applicable development category, pollutants of concern, watershed description, and long term maintenance responsibilities for the project, and any applicable water quality credits. This information will be used in conjunction with the information in Section 3, Site Description, to establish the performance criteria and to select the LID BMP or other BMP for the project or other alternative programs that the project will participate in, which are described in Section 4.

Form 2.1-1 Description of Proposed Project

1 Development Category (Select all that apply):

☐ Significant re-development involving the addition or replacement of 5,000 ft^2 or more of impervious surface on an already developed site	☒ New development involving the creation of 10,000 ft^2 or more of impervious surface collectively over entire site	☐ Automotive repair shops with standard industrial classification (SIC) codes 5013, 5014, 5541, 7532- 7534, 7536-7539	☐ Restaurants (with SIC code 5812) where the land area of development is 5,000 ft^2 or more
☐ Hillside developments of 5,000 ft^2 or more which are located on areas with known erosive soil conditions or where the natural slope is 25 percent or more	☐ Developments of 2,500 ft^2 of impervious surface or more adjacent to (within 200 ft) or discharging directly into environmentally sensitive areas or waterbodies listed on the CWA Section 303(d) list of impaired waters.	☐ Parking lots of 5,000 ft^2 or more exposed to storm water	☐ Retail gasoline outlets that are either 5,000 ft^2 or more, or have a projected average daily traffic of 100 or more vehicles per day

☐ Non-Priority / Non-Category Project *May require source control LID BMPs and other LIP requirements. Please consult with local jurisdiction on specific requirements*.

2 Project Area (ft2):	214,322	**3** Number of Dwelling Units:	n/a	**4** SIC Code:	4941

5 Is Project going to be phased? Yes ☐ No ☒ *If yes, ensure that the WQMP evaluates each phase as a distinct DA, requiring LID BMPs to address runoff at time of completion.*

6 Does Project include roads? Yes ☐ No ☒ *If yes, ensure that applicable requirements for transportation projects are addressed (see Appendix A of TGD for WQMP)*

2.2 Property Ownership/Management

Describe the ownership/management of all portions of the project and site. State whether any infrastructure will transfer to public agencies (City, County, Caltrans, etc.) after project completion. State if a homeowners or property owners association will be formed and be responsible for the long-term maintenance of project stormwater facilities. Describe any lot-level stormwater features that will be the responsibility of individual property owners.

Form 2.2-1 Property Ownership/Management

Describe property ownership/management responsible for long-term maintenance of WQMP stormwater facilities:

The maintenance of the proposed development is the responsibility of the owner. There is no homeowner or property owner's association set up for this proposed development. All of the BMPs are the responsibility of the owner to maintain.

Owner information:
San Antonio Water Company
139 N Euclid Ave
Upland, CA 91786
(909) 982-4107
Contact
email

2.3 Potential Stormwater Pollutants

Determine and describe expected stormwater pollutants of concern based on land uses and site activities (refer to Table 3-3 in the TGD for WQMP).

Form 2.3-1 Pollutants of Concern			
Pollutant	Please check: E=Expected, N=Not Expected		Additional Information and Comments
Pathogens (Bacterial / Virus)	E ☒	N ☐	Wild Birds and animal wastes, garbage.
Nutrients - Phosphorous	E ☒	N ☐	Fertilizers, food waste, garbage.
Nutrients - Nitrogen	E ☒	N ☐	Fertilizers, food waste, garbage.
Noxious Aquatic Plants	E ☒	N ☐	Landscape areas.
Sediment	E ☒	N ☐	Driveways, rooftops and sidewalks.
Metals	E ☒	N ☐	Car and truck use.
Oil and Grease	E ☒	N ☐	Car and truck use.
Trash/Debris	E ☒	N ☐	Poorly managed trash containers and parking lot.
Pesticides / Herbicides	E ☒	N ☐	Landscape use.
Organic Compounds	E ☒	N ☐	Landscape use and fertilizers.
Other: Oxygen Demanding Compounds	E ☒	N ☐	Landscape areas.
Other:	E ☐	N ☐	
Other:	E ☐	N ☐	
Other:	E ☐	N ☐	
Other:	E ☐	N ☐	

2.4 Water Quality Credits

A water quality credit program is applicable for certain types of development projects if it is not feasible to meet the requirements for on-site LID. Proponents for eligible projects, as described below, can apply for water quality credits that would reduce project obligations for selecting and sizing other treatment BMP or participating in other alternative compliance programs. Refer to Section 6.2 in the TGD for WQMP to determine if water quality credits are applicable for the project.

Form 2.4-1 Water Quality Credits

1 Project Types that Qualify for Water Quality Credits: *Select all that apply*

☐ Redevelopment projects that reduce the overall impervious footprint of the project site. [Credit = % impervious reduced]	Higher density development projects ☐ Vertical density [20%] ☐ 7 units/ acre [5%]	☐ Mixed use development, (combination of residential, commercial, industrial, office, institutional, or other land uses which incorporate design principles that demonstrate environmental benefits not realized through single use projects) [20%]	☐ Brownfield redevelopment (redevelop real property complicated by presence or potential of hazardous contaminants) [25%]
☐ Redevelopment projects in established historic district, historic preservation area, or similar significant core city center areas [10%]	☐ Transit-oriented developments (mixed use residential or commercial area designed to maximize access to public transportation) [20%]	☐ In-fill projects (conversion of empty lots & other underused spaces < 5 acres, substantially surrounded by urban land uses, into more beneficially used spaces, such as residential or commercial areas) [10%]	☐ Live-Work developments (variety of developments designed to support residential and vocational needs) [20%]

2 Total Credit 0% *(Total all credit percentages up to a maximum allowable credit of 50 percent)*

Description of Water Quality Credit Eligibility (if applicable)	n/a

Section 3 Site and Watershed Description

Describe the project site conditions that will facilitate the selection of BMP through an analysis of the physical conditions and limitations of the site and its receiving waters. Identify distinct drainage areas (DA) that collect flow from a portion of the site and describe how runoff from each DA (and sub-watershed DMAs) is conveyed to the site outlet(s). Refer to Section 3.2 in the TGD for WQMP. The form below is provided as an example. Then complete Forms 3.2 and 3.3 for each DA on the project site. ***If the project has more than one drainage area for stormwater management, then complete additional versions of these forms for each DA / outlet.***

Form 3-1 Site Location and Hydrologic Features

Site coordinates *take GPS measurement at approximate center of site*	Latitude 34°08'08"N	Longitude 117°38'43"W	Thomas Bros Map page 572 C5

1 San Bernardino County climatic region: ☒ Valley ☐ Mountain

2 Does the site have more than one drainage area (DA): Yes☐ No☒ *If no, proceed to Form 3-2. If yes, then use this form to show a conceptual schematic describing DMAs and hydrologic feature connecting DMAs to the site outlet(s). An example is provided below that can be modified for proposed project or a drawing clearly showing DMA and flow routing may be attached*

DA 1 ⟶ OUTLET 1
DA 2 ⟶ OUTLET 2

Conveyance	Briefly describe on-site drainage features to convey runoff that is not retained within a DMA
DA 1 to Outlet 1	Storm water runoff is directed towards a proposed landscape infiltration basin located north of the proposed office building. The drainage area consists of the northeast quadrant of the site which is primarily landscape and the proposed office building. The overflow from this basin will discharge at the west end of the basin and sheet into the undisturbed area, continuing southwest in the same manner as the pre-developed flows.
DA 2 to Outlet 2	Storm water runoff is directed southerly towards curb and gutters in the south paved driveway access adjacent to the maintenance building. The westerly drive and southerly area will be collected in a series of catch basin inlets that convey flows in a proposed storm drain pipe towards a proposed underground infiltration system located just westerly of the paved areas. The access manhole will have a grated manhole cover to allow the system flows to bubble out onto the surface when the system is full. This will only occur during large storms. The infiltration rate is high and will allow smaller storms to be contained within the system and infiltrate rapidly. The overflows will drain towards the existing ravine in the southwest corner of the site.

Form 3-2 Existing Hydrologic Characteristics for Drainage Area 1

For Drainage Area 1's sub-watershed DMA, provide the following characteristics	DMA A	DMA B	DMA C	DMA D
1 DMA drainage area (ft^2)	45,262	169,059		
2 Existing site impervious area (ft^2)	18,157	64,760		
3 Antecedent moisture condition *For desert areas, use* *http://www.sbcounty.gov/dpw/floodcontrol/pdf/20100412map.pdf*	II	II		
4 Hydrologic soil group *Refer to Watershed Mapping Tool – http://sbcounty.permitrack.com/WAP*	B	B		
5 Longest flowpath length (ft)	668			
6 Longest flowpath slope (ft/ft)	0.004			
7 Current land cover type(s) *Select from Fig C-3 of Hydrology Manual*	Dirt	Dirt		
8 Pre-developed pervious area condition: *Based on the extent of wet season vegetated cover good >75%; Fair 50-75%; Poor <50% Attach photos of site to support rating*	Poor	Poor		

Form 3-3 Watershed Description for Drainage Area

Receiving waters *Refer to Watershed Mapping Tool - http://sbcounty.permitrack.com/WAP See 'Drainage Facilities" link at this website*	City of Fontana Storm Drain of Poplar Ave., San Sevaine Channel, Santa Ana River Reach 3, Prado Dam, Santa Ana River Reach 2, Santa Ana River Reach 1, Pacific Ocean
Applicable TMDLs *Refer to Local Implementation Plan*	San Sevaine Channel – None Santa Ana River Reach 3 – Bacterial Indicator Prado Dam – None Santa Ana River Reach 2 – None Santa Ana River Reach 1 – None Pacific Ocean – None
303(d) listed impairments *Refer to Local Implementation Plan and Watershed Mapping Tool – http://sbcounty.permitrack.com/WAP and State Water Resources Control Board website – http://www.waterboards.ca.gov/santaana/water_issues/programs/tmdl/index.shtml*	San Sevaine Channel – None Santa Ana River Reach 3 - Copper/Lead/Bacterial Indicator Prado Dam – pH Santa Ana River Reach 2 - None Santa Ana River Reach 1 – None Pacific Ocean - None
Environmentally Sensitive Areas (ESA) *Refer to Watershed Mapping Tool – http://sbcounty.permitrack.com/WAP*	n/a
Unlined Downstream Water Bodies *Refer to Watershed Mapping Tool – http://sbcounty.permitrack.com/WAP*	Santa Ana River
Hydrologic Conditions of Concern	☐ Yes *Complete Hydrologic Conditions of Concern (HCOC) Assessment. Include Forms 4.2-2 through Form 4.2-5 and Hydromodification BMP Form 4.3-10 in submittal* ☒ No, project drains to an adequate sump, Prado Dam and Santa Ana River, per TGD 3.4.
Watershed–based BMP included in a RWQCB approved WAP	☐ Yes *Attach verification of regional BMP evaluation criteria in WAP* • *More Effective than On-site LID* • *Remaining Capacity for Project DCV* • *Upstream of any Water of the US* • *Operational at Project Completion* • *Long-Term Maintenance Plan* ☒ No

Section 4 Best Management Practices (BMP)

4.1 Source Control BMP

4.1.1 Pollution Prevention

Non-structural and structural source control BMP are required to be incorporated into all new development and significant redevelopment projects. Form 4.1-1 and 4.1-2 are used to describe specific source control BMPs used in the WQMP or to explain why a certain BMP is not applicable. Table 7-3 of the TGD for WQMP provides a list of applicable source control BMP for projects with specific types of potential pollutant sources or activities. The source control BMP in this table must be implemented for projects with these specific types of potential pollutant sources or activities.

The preparers of this WQMP have reviewed the source control BMP requirements for new development and significant redevelopment projects. The preparers have also reviewed the specific BMP required for project as specified in Forms 4.1-1 and 4.1-2. All applicable non-structural and structural source control BMP shall be implemented in the project.

Form 4.1-1 Non-Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, if not applicable, state reason
		Included	Not Applicable	
N1	Education of Property Owners, Tenants and Occupants on Stormwater BMPs	☒	☐	The owner shall familiarize himself with the contents of the WQMP and furnish copies of city and county BMP factsheets to all future tenants through lease agreements.
N2	Activity Restrictions	☒	☐	Tenants shall not be allowed to discharge chemicals, chemical residues, wastewater or other prohibited discharges (sediment, trash, fertilizers, pesticides, heavy metals, petroleum products or pollutants), to the outside, paved areas of the site. Pesticide application shall be done by a certified applicator.
N3	Landscape Management BMPs	☒	☐	Landscape crews shall inspect the irrigation system and shall report all drainage problems to the owner. At a minimum, owner shall ensure landscape management BMPs are implemented, including application of fertilizers/pesticides by licensed persons.
N4	BMP Maintenance	☒	☐	All site, source and treatment control BMPs outlined in this WQMP shall be maintained as outlined in Section 5 of this WQMP..
N5	Title 22 CCR Compliance (How development will comply)	☐	☒	Medical Waste Storage is not a project feature.
N6	Local Water Quality Ordinances	☒	☐	The owner shall ensure that all business activities at the site comply with the County of San Bernardino stormwater ordinance through the implementation of BMP through this WQMP.
N7	Spill Contingency Plan	☒	☐	Hazardous waste such as oils, lubricants, etc. will have a spill contingency plan developed by the operator. Absorbent materials shall be kept onsite to apply to oil/grease leaks in the parking lot. A spill cleanup and disposal process shall be created and all applicable employees shall be trained accordingly.
N8	Underground Storage Tank Compliance	☐	☒	Underground storage tanks are not a project feature.
N9	Hazardous Materials Disclosure Compliance	☒	☐	The operator will complete the Hazardous Waste Compliance based on storage of oils, lubricants, etc.

Form 4.1-1 Non-Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, if not applicable, state reason
		Included	Not Applicable	
N10	Uniform Fire Code Implementation	☒	☐	Building will be fitted with fire sprinklers, including areas of hazardous waste storage.
N11	Litter/Debris Control Program	☒	☐	A program shall be implemented to pick up litter of the site weekly. The trash enclosure is to be swept and cleaned on a daily basis. Trash enclosures are designed to divert all flows around the enclosure. Enclosure is designed with a roof cover. All dumpsters will have lids installed and will be inspected to ensure that the dumpsters remain covered and leak-proof. The owner shall ensure tenants contract with a refuse company to have the dumpsters emptied on a weekly basis, at a minimum.
N12	Employee Training	☒	☐	Owner shall utilize the attached County brochures for employee training on stormwater best management practices. Training to occur within the first three months of hire, and annually thereafter.
N13	Housekeeping of Loading Docks	☐	☒	Docks are not a project design feature.
N14	Catch Basin Inspection Program	☒	☐	The on-site catch basins shall be inspected monthly during the rainy season (October-May) and before and after each storm to ensure proper operation. The owner shall contract with a qualified landscape contractor to inspect and clean out accumulation of trash, litter and sediment and check for evidence of illegal dumping of waste materials into on-site drains.
N15	Vacuum Sweeping of Private Streets and Parking Lots	☒	☐	Parking lots shall be vacuum swept weekly to prevent sediment, garden waste, and trash, or other pollutants from entering on-site drains and public storm channels. Vacuum sweeping will be done by a landscape contractor or other contractor provided by the owner.
N16	Other Non-structural Measures for Public Agency Projects	☐	☒	No measures required.
N17	Comply with all other applicable NPDES permits	☒	☐	NPDES General Construction Activities Permit to be complied with by filing a notice of intent and SWPPP with the state and obtaining a WDID Discharge Permit Number prior to commencement of construction activities, covered under the permit. Industrial Gneral Permit will be applied for by the owner/operator.

Form 4.1-2 Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, If not applicable, state reason
		Included	Not Applicable	
S1	Provide storm drain system stencilling and signage (CASQA New Development BMP Handbook SD-13)	☒	☐	A painted message "No Dumping-Drains to Ocean" shall be placed on each catch basin. The message shall be inspected annually & repainted as necessary.
S2	Design and construct outdoor material storage areas to reduce pollution introduction (CASQA New Development BMP Handbook SD-34)	☒	☐	Storage materials for construction/maintenance projects stored in covered enclosures.
S3	Design and construct trash and waste storage areas to reduce pollution introduction (CASQA New Development BMP Handbook SD-32)	☒	☐	Stormwater flows are designed to flow around waste areas. Trash enclosures shall be paved and have permanent roof or awning. All dumpster shall have working lids which shall be kept closed at all times.
S4	Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control (Statewide Model Landscape Ordinance; CASQA New Development BMP Handbook SD-12)	☒	☐	Implement landscape plans consistent with county water conservation ordinances, which shall include provision of weather-based controllers, rain shutoff devices, drip irrigation heads and recessed finish grade of all landscaped areas.
S5	Finish grade of landscaped areas at a minimum of 1-2 inches below top of curb, sidewalk, or pavement	☒	☐	Landscape is to be depressed 1-2".
S6	Protect slopes and channels and provide energy dissipation (CASQA New Development BMP Handbook SD-10)	☒	☐	Rip-rap proposed to prevent erosion at overflow locations in southwest and southeast corners.
S7	Covered dock areas (CASQA New Development BMP Handbook SD-31)	☐	☒	Covered dock areas are not a design feature of this project.
S8	Covered maintenance bays with spill containment plans (CASQA New Development BMP Handbook SD-31)	☐	☒	Maintenance bays are not located inside the maintenance building and have internal drains that are directed through a clarifier that are on the sanitary sewer system.
S9	Vehicle wash areas with spill containment plans (CASQA New Development BMP Handbook SD-33)	☐	☒	Vehicle washing is not conducted inside the maintenance building in a truck wash bay. All wash waters are collected in a drain and directed through a clarifier prior to discharge into sanitary sewer
S10	Covered outdoor processing areas (CASQA New Development BMP Handbook SD-36)	☐	☒	Outdoor processing is not a project feature.

Form 4.1-2 Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, If not applicable, state reason
		Included	Not Applicable	
S11	Equipment wash areas with spill containment plans (CASQA New Development BMP Handbook SD-33)	☐	☒	Equipment washing is not a project feature.
S12	Fueling areas (CASQA New Development BMP Handbook SD-30)	☐	☒	Fueling is not a project feature.
S13	Hillside landscaping (CASQA New Development BMP Handbook SD-10)	☐	☒	Hillsides are not a project feature.
S14	Wash water control for food preparation areas	☐	☒	Food preparation is not a project feature.
S15	Community car wash racks (CASQA New Development BMP Handbook SD-33)	☐	☒	Community car wash racks are not a project feature.

4.1.2 Preventative LID Site Design Practices

Site design practices associated with new LID requirements in the MS4 Permit should be considered in the earliest phases of a project. Preventative site design practices can result in smaller DCV for LID BMP and hydromodification control BMP by reducing runoff generation. Describe site design and drainage plan including:

- A narrative of site design practices utilized or rationale for not using practices
- A narrative of how site plan incorporates preventive site design practices
- Include an attached Site Plan layout which shows how preventative site design practices are included in WQMP

Refer to Section 5.2 of the TGD for WQMP for more details.

Form 4.1-3 Preventative LID Site Design Practices Checklist

Site Design Practices *If yes, explain how preventative site design practice is addressed in project site plan. If no, other LID BMPs must be selected to meet targets*
Minimize impervious areas: Yes ☒ No ☐ Explanation: Impervious cover for the proposed development is less than typical projects of this size. West portion of site is base paved to reduce impervious area.
Maximize natural infiltration capacity: Yes ☒ No ☐ Explanation: The proposed development includes one underground infiltration systems and one infiltration basin to utilize the site's natural infiltration capacity.
Preserve existing drainage patterns and time of concentration: Yes ☒ No ☐ Explanation: The existing drainage pattern has been mimicked in the site design, directing storm flows to an infiltration basin north of the proposed building for DA1. DA1 will sheet south and west to an underground infiltration system near the southwest corner.
Disconnect impervious areas: Yes ☒ No ☐ Explanation: On-site storm flows on the site are directed to the proposed on-site underground storage infiltration systems to be mitigated before possible overflow discharges from the site. Roof drains at office building will discharge to landscape along north side of building and be directed to infiltration basin in landscape area.
Protect existing vegetation and sensitive areas: Yes ☒ No ☐ Explanation: The existing site contains no vegetation or sensitive areas. The proposed development will increase vegetation of the site with proposed landscaping.
Re-vegetate disturbed areas: Yes ☒ No ☐ Explanation: The disturbed area will be stabilized with pavement, base paving and landscaping.
Minimize unnecessary compaction in stormwater retention/infiltration basin/trench areas: Yes ☒ No ☐ Explanation: The proposed underground infiltration system is to be excavated only. Compaction of native soils within the system's limits is prohibited. Compaction of system during installation must be in conformance with manufacturer's specifications. The infiltration basin will also be marked out for no compaction.
Utilize vegetated drainage swales in place of underground piping or imperviously lined swales: Yes ☐ No ☒ Explanation: North parking lot drains to a vegetated infiltration basin.
Stake off areas that will be used for landscaping to minimize compaction during construction : Yes ☒ No ☐ Explanation: Landscape areas to be staked off to prevent compaction of these areas.

4.2 Project Performance Criteria

The purpose of this section of the Project WQMP is to establish targets for post-development hydrology based on performance criteria specified in the MS4 Permit. These targets include runoff volume for water quality control (referred to as LID design capture volume), and runoff volume, time of concentration, and peak runoff for protection of any downstream waterbody segments with a HCOC. If the project has more than one outlet for stormwater runoff, then complete additional versions of these forms for each DA / outlet.
Methods applied in the following forms include:

- For LID BMP Design Capture Volume (DCV), the San Bernardino County Stormwater Program requires use of the P_6 method (MS4 Permit Section XI.D.6a.ii) – Form 4.2-1

- For HCOC pre- and post-development hydrologic calculation, the San Bernardino County Stormwater Program requires the use of the Rational Method (San Bernardino County Hydrology Manual Section D). Forms 4.2-2 through Form 4.2-5 calculate hydrologic variables including runoff volume, time of concentration, and peak runoff from the project site pre- and post-development using the Hydrology Manual Rational Method approach. For projects greater than 640 acres (1.0 mi^2), the Rational Method and these forms should not be used. For such projects, the Unit Hydrograph Method (San Bernardino County Hydrology Manual Section E) shall be applied for hydrologic calculations for HCOC performance criteria.

Refer to Section 4 in the TGD for WQMP for detailed guidance and instructions.

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume (DA 1)

1 Project area DA 2 (ft^2): 45,262	**2** Imperviousness after applying preventative site design practices (Imp%): 40%	**3** Runoff Coefficient (Rc): 0.28 *$R_c = 0.858(Imp\%)^{\wedge 3}-0.78(Imp\%)^{\wedge 2}+0.774(Imp\%)+0.04$*
4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.658 *http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html*		
5 Compute P_6, Mean 6-hr Precipitation (inches): 0.97 *P_6 = Item 4 *C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*		
6 Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24 hour drawdown time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*		24-hrs ☐ 48-hrs ☒
7 Compute design capture volume, DCV (ft^3): 2,011 *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)* *Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*		

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume (DA 2)

1 Project area DA 2 (ft^2): 169,059	**2** Imperviousness after applying preventative site design practices (Imp%): 38%	**3** Runoff Coefficient (Rc): 0.27 *$R_c = 0.858(Imp\%)^{\wedge 3}-0.78(Imp\%)^{\wedge 2}+0.774(Imp\%)+0.04$*
4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.658 *http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html*		
5 Compute P_6, Mean 6-hr Precipitation (inches): 0.97 *P_6 = Item 4 *C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*		
6 Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24 hour drawdown time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*		24-hrs ☐ 48-hrs ☒
7 Compute design capture volume, DCV (ft^3): 7,243 *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a fu5,344nction of drawdown rate (24-hr = 1.582; 48-hr = 1.963)* *Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*		

Form 4.2-2 Summary of HCOC Assessment

Does project have the potential to cause or contribute to an HCOC in a downstream channel: Yes ☐ No ☒

Go to: http://sbcounty.permitrack.com/WAP

If "Yes", then complete HCOC assessment of site hydrology for 2yr storm event using Forms 4.2-3 through 4.2-5 and insert results below

(Forms 4.2-3 through 4.2-5 may be replaced by computer software analysis based on the San Bernardino County Hydrology Manual)

If "No," then proceed to Section 4.3 Project Conformance Analysis

Condition	Runoff Volume (ft^3)	Time of Concentration (min)	Peak Runoff (cfs)
Pre-developed	**1** *Form 4.2-3 Item 12*	**2** *Form 4.2-4 Item 13*	**3** *Form 4.2-5 Item 10*
Post-developed	**4** *Form 4.2-3 Item 13*	**5** *Form 4.2-4 Item 14*	**6** *Form 4.2-5 Item 14*
Difference	**7** *Item 4 – Item 1*	**8** *Item 2 – Item 5*	**9** *Item 6 – Item 3*
Difference (as % of pre-developed)	**10** % *Item 7 / Item 1*	**11** % *Item 8 / Item 2*	**12** % *Item 9 / Item 3*

Form 4.2-3 HCOC Assessment for Runoff Volume

Weighted Curve Number Determination for: Pre-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1a Land Cover type								
2a Hydrologic Soil Group (HSG)								
3a DMA Area, ft^2 *sum of areas of DMA should equal area of DA*								
4a Curve Number (CN) *use Items 1 and 2 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*								
Weighted Curve Number Determination for: Post-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1b Land Cover type								
2b Hydrologic Soil Group (HSG)								
3b DMA Area, ft^2 *sum of areas of DMA should equal area of DA*								
4b Curve Number (CN) *use Items 5 and 6 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*								

5 Pre-Developed area-weighted CN:	**7** Pre-developed soil storage capacity, S (in): *S = (1000 / Item 5) - 10*	**9** Initial abstraction, I_a (in): *I_a = 0.2 * Item 7*
6 Post-Developed area-weighted CN:	**8** Post-developed soil storage capacity, S (in): *S = (1000 / Item 6) - 10*	**10** Initial abstraction, I_a (in): *I_a = 0.2 * Item 8*

11 Precipitation for 2 yr, 24 hr storm (in):
Go to: http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

12 Pre-developed Volume (ft^3):
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 9)^2 / ((Item 11 – Item 9 + Item 7)*

13 Post-developed Volume (ft^3):
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 10)^2 / ((Item 11 – Item 10 + Item 8)*

14 Volume Reduction needed to meet HCOC Requirement, (ft^3):
*V_{HCOC} = (Item 13 * 0.95) – Item 12*

Form 4.2-4 HCOC Assessment for Time of Concentration

Compute time of concentration for pre and post developed conditions for each DA *(For projects using the Hydrology Manual complete the form below)*

Variables	Pre-developed DA1 *Use additional forms if there are more than 4 DMA*				Post-developed DA1 *Use additional forms if there are more than 4 DMA*			
	DMA A	DMA B	DMA C	DMA D	DMA A	DMA B	DMA C	DMA D
1 Length of flowpath (ft) *Use Form 3-2 Item 5 for pre-developed condition*								
2 Change in elevation (ft)								
3 Slope (ft/ft), S_o = *Item 2 / Item 1*								
4 Land cover								
5 Initial DMA Time of Concentration (min) *Appendix C-1 of the TGD for WQMP*								
6 Length of conveyance from DMA outlet to project site outlet (ft) *May be zero if DMA outlet is at project site outlet*								
7 Cross-sectional area of channel (ft^2)								
8 Wetted perimeter of channel (ft)								
9 Manning's roughness of channel (n)								
10 Channel flow velocity (ft/sec) V_{fps} = *(1.49 / Item 9) * (Item 7/Item 8)^0.67 * (Item 3)^0.5*								
11 Travel time to outlet (min) T_t = *Item 6 / (Item 10 * 60)*								
12 Total time of concentration (min) T_c = *Item 5 + Item 11*								

13 Pre-developed time of concentration (min): *Minimum of Item 12 pre-developed DMA*

14 Post-developed time of concentration (min): *Minimum of Item 12 post-developed DMA*

15 Additional time of concentration needed to meet HCOC requirement (min): $T_{C\text{-}HCOC}$ = *(Item 13 * 0.95) – Item 14*

Form 4.2-5 HCOC Assessment for Peak Runoff

Compute peak runoff for pre- and post-developed conditions

Variables		Pre-developed DA to Project Outlet (*Use additional forms if more than 3 DMA)*			Post-developed DA to Project Outlet (*Use additional forms if more than 3 DMA)*		
		DMA A	DMA B	DMA C	DMA A	DMA B	DMA C
1 Rainfall Intensity for storm duration equal to time of concentration *I_{peak} = 10^(LOG Form 4.2-1 Item 4 - 0.6 LOG Form 4.2-4 Item 5 /60)*							
2 Drainage Area of each DMA (Acres) *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
3 Ratio of pervious area to total area *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
4 Pervious area infiltration rate (in/hr) *Use pervious area CN and antecedent moisture condition with Appendix C-3 of the TGD for WQMP*							
5 Maximum loss rate (in/hr) *F_m = Item 3 * Item 4* *Use area-weighted F_m from DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
6 Peak Flow from DMA (cfs) *Q_p =Item 2 * 0.9 * (Item 1 - Item 5)*							
7 Time of concentration adjustment factor for other DMA to site discharge point *Form 4.2-4 Item 12 DMA / Other DMA upstream of site discharge point (If ratio is greater than 1.0, then use maximum value of 1.0)*	DMA A	*n/a*			*n/a*		
	DMA B		*n/a*			*n/a*	
	DMA C			*n/a*			*n/a*

8 Pre-developed Q_p at T_c for DMA A: *Q_p = Item 6_{DMAA} + [Item 6_{DMAB} * (Item 1_{DMAA} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAA/2}$] + [Item 6_{DMAC} * (Item 1_{DMAA} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAA/3}$]*	**9** Pre-developed Q_p at T_c for DMA B: *Q_p = Item 6_{DMAB} + [Item 6_{DMAA} * (Item 1_{DMAB} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAB/1}$] + [Item 6_{DMAC} * (Item 1_{DMAB} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAB/3}$]*	**10** Pre-developed Q_p at T_c for DMA C: *Q_p = Item 6_{DMAC} + [Item 6_{DMAA} * (Item 1_{DMAC} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAC/1}$] + [Item 6_{DMAB} * (Item 1_{DMAC} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAC/2}$]*
10 Peak runoff from pre-developed condition confluence analysis (cfs):		*Maximum of Item 8, 9, and 10 (including additional forms as needed)*
11 Post-developed Q_p at T_c for DMA A: *Same as Item 8 for post-developed values*	**12** Post-developed Q_p at T_c for DMA B: *Same as Item 9 for post-developed values*	**13** Post-developed Q_p at T_c for DMA C: *Same as Item 10 for post-developed values*
14 Peak runoff from post-developed condition confluence analysis (cfs):		*Maximum of Item 11, 12, and 13 (including additional forms as needed)*
15 Peak runoff reduction needed to meet HCOC Requirement (cfs):		$Q_{p\text{-}HCOC}$ *= (Item 14 * 0.95) – Item 10*

4.3 Project Conformance Analysis

Complete the following forms for each project site DA to document that the proposed LID BMPs conform to the project DCV developed to meet performance criteria specified in the MS4 Permit (WQMP Template Section 4.2). For the LID DCV, the forms are ordered according to hierarchy of BMP selection as required by the MS4 Permit (see Section 5.3.1 in the TGD for WQMP). The forms compute the following for on-site LID BMP:

- Site Design and Hydrologic Source Controls (Form 4.3-2)
- Retention and Infiltration (Form 4.3-3)
- Harvested and Use (Form 4.3-4) or
- Biotreatment (Form 4.3-5).

At the end of each form, additional fields facilitate the determination of the extent of mitigation provided by the specific BMP category, allowing for use of the next category of BMP in the hierarchy, if necessary.
The first step in the analysis, using Section 5.3.2.1 of the TGD for WQMP, is to complete Forms 4.3-1 and 4.3-3) to determine if retention and infiltration BMPs are infeasible for the project. For each feasibility criterion in Form 4.3-1, if the answer is "Yes," provide all study findings that includes relevant calculations, maps, data sources, etc. used to make the determination of infeasibility.
Next, complete Forms 4.3-2 and 4.3-4 to determine the feasibility of applicable HSC and harvest and use BMPs, and, if their implementation is feasible, the extent of mitigation of the DCV.
If no site constraints exist that would limit the type of BMP to be implemented in a DA, evaluate the use of combinations of LID BMPs, including all applicable HSC BMPs to maximize on-site retention of the DCV. If no combination of BMP can mitigate the entire DCV, implement the single BMP type, or combination of BMP types, that maximizes on-site retention of the DCV within the minimum effective area.
If the combination of LID HSC, retention and infiltration, and harvest and use BMPs are unable to mitigate the entire DCV, then biotreatment BMPs may be implemented by the project proponent. If biotreatment BMPs are used, then they must be sized to provide sufficient capacity for effective treatment of the remainder of the volume-based performance criteria that cannot be achieved with LID BMPs (TGD for WQMP Section 5.4.4.2).
Under no circumstances shall any portion of the DCV be released from the site without effective mitigation and/or treatment.

Form 4.3-1 Infiltration BMP Feasibility

Feasibility Criterion – Complete evaluation for each DA on the Project Site

1 Would infiltration BMP pose significant risk for groundwater related concerns? Yes ☐ No ☒

Refer to Section 5.3.2.1 of the TGD for WQMP

If Yes, Provide basis: (attach)

2 Would installation of infiltration BMP significantly increase the risk of geotechnical hazards? Yes ☐ No ☒

(Yes, if the answer to any of the following questions is yes, as established by a geotechnical expert):

- The location is less than 50 feet away from slopes steeper than 15 percent
- The location is less than eight feet from building foundations or an alternative setback.
- A study certified by a geotechnical professional or an available watershed study determines that stormwater infiltration would result in significantly increased risks of geotechnical hazards.

If Yes, Provide basis: (attach)

3 Would infiltration of runoff on a Project site violate downstream water rights? Yes ☐ No ☒

If Yes, Provide basis: (attach)

4 Is proposed infiltration facility located on hydrologic soil group (HSG) D soils or does the site geotechnical investigation indicate presence of soil characteristics, which support categorization as D soils? Yes ☐ No ☒

If Yes, Provide basis: (attach)

5 Is the design infiltration rate, after accounting for safety factor of 2.0, below proposed facility less than 0.3 in/hr (accounting for soil amendments)? Yes ☐ No ☒

If Yes, Provide basis: (attach)

6 Would on-site infiltration or reduction of runoff over pre-developed conditions be partially or fully inconsistent with watershed management strategies as defined in the WAP, or impair beneficial uses? Yes ☐ No ☒

See Section 3.5 of the TGD for WQMP and WAP

If Yes, Provide basis: (attach)

7 Any answer from Item 1 through Item 3 is "Yes": Yes ☐ No ☒

If yes, infiltration of any volume is not feasible onsite. Proceed to Form 4.3-4, Harvest and Use BMP. If no, then proceed to Item 8 below.

8 Any answer from Item 4 through Item 6 is "Yes": Yes ☐ No ☒

If yes, infiltration is permissible but is not required to be considered. Proceed to Form 4.3-2, Hydrologic Source Control BMP.
If no, then proceed to Item 9, below.

9 All answers to Item 1 through Item 6 are "No": Yes ☒ No ☐

Infiltration of the full DCV is potentially feasible, LID infiltration BMP must be designed to infiltrate the full DCV to the MEP.
Proceed to Form 4.3-2, Hydrologic Source Control BMP.

4.3.1 Site Design Hydrologic Source Control BMP

Section XI.E. of the Permit emphasizes the use of LID preventative measures; and the use of LID HSC BMPs reduces the portion of the DCV that must be addressed in downstream BMPs. Therefore, all applicable HSC shall be provided except where they are mutually exclusive with each other, or with other BMPs. Mutual exclusivity may result from overlapping BMP footprints such that either would be potentially feasible by itself, but both could not be implemented. Please note that while there are no numeric standards regarding the use of HSC, if a project cannot feasibly meet BMP sizing requirements or cannot fully address HCOCs, feasibility of all applicable HSC must be part of demonstrating that the BMP system has been designed to retain the maximum feasible portion of the DCV. Complete Form 4.3-2 to identify and calculate estimated retention volume from implementing site design HSC BMP. Refer to Section 5.4.1 in the TGD for more detailed guidance.

Form 4.3-2 Site Design Hydrologic Source Control BMPs (DA1)

1 Implementation of Impervious Area Dispersion BMP (i.e. routing runoff from impervious to pervious areas), excluding impervious areas planned for routing to on-lot infiltration BMP: Yes ☐ No ☒ *If yes, complete Items 2-5; If no, proceed to Item 6*	DA 1	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Total impervious area draining to pervious area (ft^2)			
3 Ratio of pervious area receiving runoff to impervious area			
4 Retention volume achieved from impervious area dispersion (ft^3) *V = Item2 * Item 3 * (0.5/12), assuming retention of 0.5 inches of runoff*			
5 Sum of retention volume achieved from impervious area dispersion (ft^3): $V_{retention}$ *=Sum of Item 4 for all BMPs*			
6 Implementation of Localized On-lot Infiltration BMPs (e.g. on-lot rain gardens): Yes ☐ No ☒ *If yes, complete Items 7-13 for aggregate of all on-lot infiltration BMP in each DA; If no, proceed to Item 14*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
7 Ponding surface area (ft^2)			
8 Ponding depth (ft)			
9 Surface area of amended soil/gravel (ft^2)			
10 Average depth of amended soil/gravel (ft)			
11 Average porosity of amended soil/gravel			
12 Retention volume achieved from on-lot infiltration (ft^3) $V_{retention}$ *= (Item 7 *Item 8) + (Item 9 * Item 10 * Item 11)*			
13 Runoff volume retention from on-lot infiltration (ft^3): $V_{retention}$ *=Sum of Item 12 for all BMPs*			
14 Implementation of evapotranspiration BMP (green, brown, or blue roofs): Yes ☐ No ☒ *If yes, complete Items 15-20. If no, proceed to Item 21*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*

Form 4.3-2 Site Design Hydrologic Source Control BMPs (DA1)

15 Rooftop area planned for ET BMP (ft^2)			
16 Average wet season ET demand (in/day) *Use local values, typical ~ 0.1*			
17 Daily ET demand (ft^3/day) *Item 15 * (Item 16 / 12)*			
18 Drawdown time (hrs) *Copy Item 6 in Form 4.2-1*			
19 Retention Volume (ft^3) *$V_{retention}$ = Item 17 * (Item 18 / 24)*			
20 Runoff volume retention from evapotranspiration BMPs (ft^3): *$V_{retention}$ =Sum of Item 19 for all BMPs*			
21 Implementation of Street Trees: Yes ☐ No ☒ *If yes, complete Items 22-25. If no, proceed to Item 26*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
22 Number of Street Trees			
23 Average canopy cover over impervious area (ft^2)			
24 Runoff volume retention from street trees (ft^3) *$V_{retention}$ = Item 22 * Item 23 * (0.05/12) assume runoff retention of 0.05 inches*			
25 Runoff volume retention from street tree BMPs (ft^3): *$V_{retention}$ = Sum of Item 24 for all BMPs*			
26 Implementation of residential rain barrels/cisterns: Yes ☐ No ☒ *If yes, complete Items 27-29; If no, proceed to Item 30*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
27 Number of rain barrels/cisterns			
28 Runoff volume retention from rain barrels/cisterns (ft^3) *$V_{retention}$ = Item 27 * 3*			
29 Runoff volume retention from residential rain barrels/Cisterns (ft3): *$V_{retention}$ =Sum of Item 28 for all BMPs*			
30 Total Retention Volume from Site Design Hydrologic Source Control BMPs: *Sum of Items 5, 13, 20, 25 and 29*			

4.3.2 Infiltration BMPs

Use Form 4.3-3 to compute on-site retention of runoff from proposed retention and infiltration BMPs. Volume retention estimates are sensitive to the percolation rate used, which determines the amount of runoff that can be infiltrated within the specified drawdown time. The infiltration safety factor reduces field measured percolation to account for potential inaccuracy associated with field measurements, declining BMP performance over time, and compaction during construction. Appendix D of the TGD for WQMP provides guidance on estimating an appropriate safety factor to use in Form 4.3-3.
If site constraints limit the use of BMPs to a single type and implementation of retention and infiltration BMPs mitigate no more than 40% of the DCV, then they are considered infeasible and the Project Proponent may evaluate the effectiveness of BMPs lower in the LID hierarchy of use (Section 5.5.1 of the TGD for WQMP)
If implementation of infiltrations BMPs is feasible as determined using Form 4.3-1, then LID infiltration BMPs shall be implemented to the MEP (section 4.1 of the TGD for WQMP).

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Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 1)

1 Remaining LID DCV not met by site design HSC BMP (ft^3): 2,011 (DA 1), 7,243 (DA 2)
V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item 30

BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP) - Use additional forms for more BMPs*	DA 1 BMP Type: Infiltration	DA 2 BMP Type: Infiltration	DA/DMA BMP Type *(Use additional forms for more BMPs)*
2 Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix D of the TGD for WQMP for minimum requirements for assessment methods*	15.62	15.62	
3 Infiltration safety factor *See TGD Section 5.4.2 and Appendix D4*	3	3	
4 Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*	5.21	5.21	
5 Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*	48 hr. max 5.41 hrs	48 hr. max 16.12 hrs	
6 Maximum ponding depth (ft) *BMP design*	20.84	20.84	
7 Ponding Depth (ft) *d_{BMP} = Minimum of (1/12*Item 4*Item 5) or Item 6*	2.35	7	
8 Infiltrating surface area, SA_{BMP} (ft^2) *the lesser of the area needed for infiltration of full DCV or minimum space requirements from Table 5.7 of the TGD for WQMP*	1,755	1,425	
9 Amended soil depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*	n/a	n/a	
10 Amended soil porosity	n/a	n/a	
11 Gravel depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*	n/a	n/a	
12 Gravel porosity	n/a	n/a	
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	3	3	
14 Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*	2,284	1,856	
15 Underground Retention Volume (ft^3) *Volume determined using manufacturer's specifications and calculations*	4,124	5,674	

16 Total Retention Volume from LID Infiltration BMPs: 6,408 (DA 1), 7,530 (DA 2)
(Sum of Items 14 and 15 for all infiltration BMP included in plan)

17 Fraction of DCV achieved with infiltration BMP: 318% (DA 1), 103.99% (DA 2)
Retention% = Item 16 / Form 4.2-1 Item 7

18 Is full LID DCV retained on-site with combination of hydrologic source control and LID retention and infiltration BMPs? Yes ☒ No ☐
If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the applicable category of development and repeat all above calculations.

4.3.3 Harvest and Use BMP

Harvest and use BMP may be considered if the full LID DCV cannot be met by maximizing infiltration BMPs. Use Form 4.3-4 to compute on-site retention of runoff from proposed harvest and use BMPs.
Volume retention estimates for harvest and use BMPs are sensitive to the on-site demand for captured stormwater. Since irrigation water demand is low in the wet season, when most rainfall events occur in San Bernardino County, the volume of water that can be used within a specified drawdown period is relatively low. The bottom portion of Form 4.3-4 facilitates the necessary computations to show infeasibility if a minimum incremental benefit of 40 percent of the LID DCV would not be achievable with MEP implementation of on-site harvest and use of stormwater (Section 5.5.4 of the TGD for WQMP).

Form 4.3-4 Harvest and Use BMPs (DA1)

1 Remaining LID DCV not met by site design HSC or infiltration BMP (ft^3): 0 *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item 30 – Form 4.3-3 Item 16*			
BMP Type(s) *Compute runoff volume retention from proposed harvest and use BMP (Select BMPs from Table 5-4 of the TGD for WQMP) - Use additional forms for more BMPs*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Describe cistern or runoff detention facility			
3 Storage volume for proposed detention type (ft^3) *Volume of cistern*			
4 Landscaped area planned for use of harvested stormwater (ft^2)			
5 Average wet season daily irrigation demand (in/day) Use local values, typical ~ 0.1 in/day			
6 Daily water demand (ft^3/day) *Item 4 * (Item 5 / 12)*			
7 Drawdown time (hrs) *Copy Item 6 from Form 4.2-1*			
8 Retention Volume (ft^3) *$V_{retention}$ = Minimum of (Item 3) or (Item 6 * (Item 7 / 24))*			
9 Total Retention Volume (ft^3) from Harvest and Use BMP *Sum of Item 8 for all harvest and use BMP included in plan*			
10 Is the full DCV retained with a combination of LID HSC, retention and infiltration, and harvest and use BMPs? Yes ☒ No ☐ *If yes, demonstrate conformance using Form 4.3-10. If no, then re-evaluate combinations of all LID BMP and optimize their implementation such that the maximum portion of the DCV is retained on-site (using a single BMP type or combination of BMP types). If the full DCV cannot be mitigated after this optimization process, proceed to Section 4.3.4.*			

4.3.4 Biotreatment BMP

Biotreatment BMPs may be considered if the full LID DCV cannot be met by maximizing retention and infiltration, and harvest and use BMPs. A key consideration when using biotreatment BMP is the effectiveness of the proposed BMP in addressing the pollutants of concern for the project (see Table 5-5 of the TGD for WQMP).

Use Form 4.3-5 to summarize the potential for volume based and/or flow based biotreatment options to biotreat the remaining unmet LID DCV w. Biotreatment computations are included as follows:

- Use Form 4.3-6 to compute biotreatment in small volume based biotreatment BMP (e.g. bioretention w/underdrains);
- Use Form 4.3-7 to compute biotreatment in large volume based biotreatment BMP (e.g. constructed wetlands);
- Use Form 4.3-8 to compute sizing criteria for flow-based biotreatment BMP (e.g. bioswales)

Form 4.3-5 Selection and Evaluation of Biotreatment BMP

1 Remaining LID DCV not met by site design HSC, infiltration, or harvest and use BMP for potential biotreatment (ft^3): 0 *Form 4.2-1 Item 7 - Form 4.3-2 Item 30 – Form 4.3-3 Item 16- Form 4.3-4 Item 9*	List pollutants of concern *Copy from Form 2.3-1.*	
2 Biotreatment BMP Selected *(Select biotreatment BMP(s) necessary to ensure all pollutants of concern are addressed through Unit Operations and Processes, described in Table 5-5 of the TGD for WQMP)*	Volume-based biotreatment *Use Forms 4.3-6 and 4.3-7 to compute treated volume*	Flow-based biotreatment *Use Form 4.3-8 to compute treated volume*
	☐ Bioretention with underdrain ☐ Planter box with underdrain ☐ Constructed wetlands ☐ Wet extended detention ☐ Dry extended detention	☐ Vegetated swale ☐ Vegetated filter strip ☐ Proprietary biotreatment
3 Volume biotreated in volume based biotreatment BMP (ft^3): *Form 4.3-6 Item 15 + Form 4.3-7 Item 13*	**4** Compute remaining LID DCV with implementation of volume based biotreatment BMP (ft^3): *Item 1 – Item 3*	**5** Remaining fraction of LID DCV for sizing flow based biotreatment BMP: % *Item 4 / Item 1*
6 Flow-based biotreatment BMP capacity provided (cfs): *Use Figure 5-2 of the TGD for WQMP to determine flow capacity required to provide biotreatment of remaining percentage of unmet LID DCV (Item 5), for the project's precipitation zone (Form 3-1 Item 1)*		
7 Metrics for MEP determination: • Provided a WQMP with the portion of site area used for suite of LID BMP equal to minimum thresholds in Table 5-7 of the TGD for WQMP for the proposed category of development: ☐ *If maximized on-site retention BMPs is feasible for partial capture, then LID BMP implementation must be optimized to retain and infiltrate the maximum portion of the DCV possible within the prescribed minimum effective area. The remaining portion of the DCV shall then be mitigated using biotreatment BMP.*		

Form 4.3-6 Volume Based Biotreatment – Bioretention and Planter Boxes with Underdrains

Biotreatment BMP Type *(Bioretention w/underdrain, planter box w/underdrain, other comparable BMP)*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
1 Pollutants addressed with BMP *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes described in Table 5-5 of the TGD for WQMP*			
2 Amended soil infiltration rate *Typical ~ 5.0*			
3 Amended soil infiltration safety factor *Typical ~ 2.0*			
4 Amended soil design percolation rate (in/hr) P_{design} *= Item 2 / Item 3*			
5 Ponded water drawdown time (hr) *Copy Item 6 from Form 4.2-1*			
6 Maximum ponding depth (ft) *see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
7 Ponding Depth (ft) d_{BMP} *= Minimum of (1/12 * Item 4 * Item 5) or Item 6*			
8 Amended soil surface area (ft^2)			
9 Amended soil depth (ft) *see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
10 Amended soil porosity, *n*			
11 Gravel depth (ft) *see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
12 Gravel porosity, *n*			
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*			
14 Biotreated Volume (ft^3) $V_{biotreated}$ *= Item 8 * [(Item 7/2) + (Item 9 * Item 10) +(Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*			
15 Total biotreated volume from bioretention and/or planter box with underdrains BMP: *Sum of Item 14 for all volume-based BMPs included in this form*			

Form 4.3-7 Volume Based Biotreatment – Constructed Wetlands and Extended Detention

Biotreatment BMP Type *Constructed wetlands, extended wet detention, extended dry detention, or other comparable proprietary BMP. If BMP includes multiple modules (e.g. forebay and main basin), provide separate estimates for storage and pollutants treated in each module.*	DA DMA BMP Type		DA DMA BMP Type *(Use additional forms for more BMPs)*	
	Forebay	Basin	Forebay	Basin
1 Pollutants addressed with BMP forebay and basin *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes described in Table 5-5 of the TGD for WQMP*				
2 Bottom width (ft)				
3 Bottom length (ft)				
4 Bottom area (ft^2) A_{bottom} = *Item 2 * Item 3*				
5 Side slope (ft/ft)				
6 Depth of storage (ft)				
7 Water surface area (ft^2) $A_{surface}$ =*(Item 2 + (2 * Item 5 * Item 6)) * (Item 3 + (2 * Item 5 * Item 6))*				
8 Storage volume (ft^3) *For BMP with a forebay, ensure fraction of total storage is within ranges specified in BMP specific fact sheets, see Table 5-6 of the TGD for WQMP for reference to BMP design details* V =*Item 6 / 3 * [Item 4 + Item 7 + (Item 4 * Item 7)^0.5]*				
9 Drawdown Time (hrs) *Copy Item 6 from Form 2.1*				
10 Outflow rate (cfs) Q_{BMP} = *(Item* $8_{forebay}$ *+ Item* 8_{basin}*) / (Item 9 * 3600)*				
11 Duration of design storm event (hrs)				
12 Biotreated Volume (ft^3) $V_{biotreated}$ = *(Item* $8_{forebay}$ *+ Item* 8_{basin}*) +(Item 10 * Item 11 * 3600)*				
13 Total biotreated volume from constructed wetlands, extended dry detention, or extended wet detention : *(Sum of Item 12 for all BMP included in plan)*				

Form 4.3-8 Flow Based Biotreatment

Biotreatment BMP Type *Vegetated swale, vegetated filter strip, or other comparable proprietary BMP*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
1 Pollutants addressed with BMP *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes described in TGD Table 5-5*			
2 Flow depth for water quality treatment (ft) *BMP specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
3 Bed slope (ft/ft) *BMP specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
4 Manning's roughness coefficient			
5 Bottom width (ft) b_w *= (Form 4.3-5 Item 6 * Item 4) / (1.49 * Item 2^1.67 * Item 3^0.5)*			
6 Side Slope (ft/ft) *BMP specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
7 Cross sectional area (ft^2) *A = (Item 5 * Item 2) + (Item 6 * Item 2^2)*			
8 Water quality flow velocity (ft/sec) *V = Form 4.3-5 Item 6 / Item 7*			
9 Hydraulic residence time (min) *Pollutant specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
10 Length of flow based BMP (ft) *L = Item 8 * Item 9 * 60*			
11 Water surface area at water quality flow depth (ft^2) SA_{top} *= (Item 5 + (2 * Item 2 * Item 6)) * Item 10*			

4.3.5 Conformance Summary

Complete Form 4.3-9 to demonstrate how on-site LID DCV is met with proposed site design hydrologic source control, infiltration, harvest and use, and/or biotreatment BMP. The bottom line of the form is used to describe the basis for infeasibility determination for on-site LID BMP to achieve full LID DCV, and provides methods for computing remaining volume to be addressed in an alternative compliance plan. If the project has more than one outlet, then complete additional versions of this form for each outlet.

Form 4.3-9 Conformance Summary and Alternative Compliance Volume Estimate (DA 1)

1 Total LID DCV for the Project DA-1 (ft^3): 15,344 *Copy Item 7 in Form 4.2-1*

2 On-site retention with site design hydrologic source control LID BMP (ft^3): 0 *Copy Item 30 in Form 4.3-2*

3 On-site retention with LID infiltration BMP (ft^3):40,596 *Copy Item 16 in Form 4.3-3*

4 On-site retention with LID harvest and use BMP (ft^3): *Copy Item 9 in Form 4.3-4*

5 On-site biotreatment with volume based biotreatment BMP (ft^3): 0 *Copy Item 3 in Form 4.3-5*

6 Flow capacity provided by flow based biotreatment BMP (cfs): 0 *Copy Item 6 in Form 4.3-5*

7 LID BMP performance criteria are achieved if answer to any of the following is "Yes":

- Full retention of LID DCV with site design HSC, infiltration, or harvest and use BMP: Yes ☒ No ☐
  If yes, sum of Items 2, 3, and 4 is greater than Item 1
- Combination of on-site retention BMPs for a portion of the LID DCV and volume-based biotreatment BMP that address all pollutants of concern for the remaining LID DCV: Yes ☐ No ☐
  If yes, a) sum of Items 2, 3, 4, and 5 is greater than Item 1, and Items 2, 3 and 4 are maximized; or b) Item 6 is greater than Form 4.3--5 Item 6 and Items 2, 3 and 4 are maximized
- On-site retention and infiltration is determined to be infeasible and biotreatment BMP provide biotreatment for all pollutants of concern for full LID DCV: Yes ☐ No ☐
  If yes, Form 4.3-1 Items 7 and 8 were both checked yes

8 If the LID DCV is not achieved by any of these means, then the project may be allowed to develop an alternative compliance plan. Check box that describes the scenario which caused the need for alternative compliance:

- Combination of HSC, retention and infiltration, harvest and use, and biotreatment BMPs provide less than full LID DCV capture: ☐
  Checked yes for Form 4.3-5 Item 7, Item 6 is zero, and sum of Items 2, 3, 4, and 5 is less than Item 1. If so, apply water quality credits and calculate volume for alternative compliance, V_{alt} *= (Item 1 – Item 2 – Item 3 – Item 4 – Item 5) * (100 - Form 2.4-1 Item 2)%*
- An approved Watershed Action Plan (WAP) demonstrates that water quality and hydrologic impacts of urbanization are more effective when managed in at an off-site facility: ☐
  Attach appropriate WAP section, including technical documentation, showing effectiveness comparisons for the project site and regional watershed

4.3.6 Hydromodification Control BMP

Use Form 4.3-10 to compute the remaining runoff volume retention, after LID BMP are implemented, needed to address HCOC, and the increase in time of concentration and decrease in peak runoff necessary to meet targets for protection of waterbodies with a potential HCOC. Describe hydromodification control BMP that address HCOC, which may include off-site BMP and/or in-stream controls. Section 5.6 of the TGD for WQMP provides additional details on selection and evaluation of hydromodification control BMP.

Form 4.3-10 Hydromodification Control BMPs

1 Volume reduction needed for HCOC performance criteria (ft^3): 0 *(Form 4.2-2 Item 4 * 0.95) – Form 4.2-2 Item 1*	**2** On-site retention with site design hydrologic source control, infiltration, and harvest and use LID BMP (ft^3): 0 *Sum of Form 4.3-9 Items 2, 3, and 4 Evaluate option to increase implementation of on-site retention in Forms 4.3-2, 4.3-3, and 4.3-4 in excess of LID DCV toward achieving HCOC volume reduction*
3 Remaining volume for HCOC volume capture (ft^3): 0 *Item 1 – Item 2*	**4** Volume capture provided by incorporating additional on-site or off-site retention BMPs (ft^3): 0 *Existing downstream BMP may be used to demonstrate additional volume capture (if so, attach to this WQMP a hydrologic analysis showing how the additional volume would be retained during a 2-yr storm event for the regional watershed)*

5 If Item 4 is less than Item 3, incorporate in-stream controls on downstream waterbody segment to prevent impacts due to hydromodification ☐ *Attach in-stream control BMP selection and evaluation to this WQMP*

6 Is Form 4.2-2 Item 11 less than or equal to 5%: Yes ☐ No ☐

If yes, HCOC performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate increase in time of concentration achieved by proposed LID site design, LID BMP, and additional on-site or off-site retention BMP ☐
  BMP upstream of a waterbody segment with a potential HCOC may be used to demonstrate increased time of concentration through hydrograph attenuation (if so, show that the hydraulic residence time provided in BMP for a 2-year storm event is equal or greater than the addition time of concentration requirement in Form 4.2-4 Item 15)
- Increase time of concentration by preserving pre-developed flow path and/or increase travel time by reducing slope and increasing cross-sectional area and roughness for proposed on-site conveyance facilities ☐
- Incorporate appropriate in-stream controls for downstream waterbody segment to prevent impacts due to hydromodification, in a plan approved and signed by a licensed engineer in the State of California ☐

7 Form 4.2-2 Item 12 less than or equal to 5%: Yes ☐ No ☐

If yes, HCOC performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate reduction in peak runoff achieved by proposed LID site design, LID BMPs, and additional on-site or off-site retention BMPs ☐
  BMPs upstream of a waterbody segment with a potential HCOC may be used to demonstrate additional peak runoff reduction through hydrograph attenuation (if so, attach to this WQMP, a hydrograph analysis showing how the peak runoff would be reduced during a 2-yr storm event)
- Incorporate appropriate in-stream controls for downstream waterbody segment to prevent impacts due to hydromodification, in a plan approved and signed by a licensed engineer in the State of California ☐

4.4 Alternative Compliance Plan (if applicable)

Describe an alternative compliance plan (if applicable) for projects not fully able to infiltrate, harvest and use, or biotreat the DCV via on-site LID practices. A project proponent must develop an alternative compliance plan to address the remainder of the LID DCV. Depending on project type some projects may qualify for water quality credits that can be applied to reduce the DCV that must be treated prior to development of an alternative compliance plan (see Form 2.4-1, Water Quality Credits). Form 4.3-9 Item 8 includes instructions on how to apply water quality credits when computing the DCV that must be met through alternative compliance. Alternative compliance plans may include one or more of the following elements:

- On-site structural treatment control BMP - All treatment control BMP should be located as close to possible to the pollutant sources and should not be located within receiving waters;
- Off-site structural treatment control BMP - Pollutant removal should occur prior to discharge of runoff to receiving waters;
- Urban runoff fund or In-lieu program, if available

Depending upon the proposed alternative compliance plan, approval by the executive officer may or may not be required (see Section 6 of the TGD for WQMP).

Section 5 Inspection and Maintenance Responsibility for Post Construction BMP

All BMP included as part of the project WQMP are required to be maintained through regular scheduled inspection and maintenance (refer to Section 8, Post Construction BMP Requirements, in the TGD for WQMP). Fully complete Form 5-1 summarizing all BMP included in the WQMP. Attach additional forms as needed. The WQMP shall also include a detailed Operation and Maintenance Plan for all BMP and may require a Maintenance Agreement (consult the jurisdiction's LIP). If a Maintenance Agreement is required, it must also be attached to the WQMP.

Form 5-1 BMP Inspection and Maintenance (use additional forms as necessary)

BMP	Reponsible Party(s)	Inspection/ Maintenance Activities Required	Minimum Frequency of Activities
N1 Education of Property Owners, Tenants, and Occupants on Stormwater BMPs	Owner	The owner shall familiarize himself with the contents of the WQMP and the County & City Ordinance and brochures and furnish copies of city and county BMP factsheets to all future tenants through lease agreements.	Educational materials will be kept onsite for reference.
N2 Activity Restrictions	Owner	Tenants shall not be allowed to discharge chemicals, chemical residues, wastewater or other prohibited discharges listed in the City and County Ordinances, to the outside, paved areas of the site. Owner shall inspect property regularly and resolve violations as needed.	Daily
N3 Landscape Management BMPs	Owner	Landscape crews shall inspect the irrigation system after each landscape procedure and shall report all drainage problems to the owner.	Be inspected bi-weekly after each landscape procedure.
N11 Litter/Debris Control Program	Owner	A program shall be implemented to pick up litter of the site weekly.	Weekly inspection and cleanup of the site.
N12 Employee Training	Owner	Owner shall utilize the attached County brochures for employee training on stormwater runoff best management practices.	Employee shall be trained upon hire and annually thereafter. Brochures from employee training will be kept on site for reference.
N14 Catch Basin Inspection Program SC-44 Drainage System Maintenance MP-52 Drain Inlet	Owner	The on-site catch basins shall be inspected monthly during the rainy season (October-May) and before and after each storm to ensure proper operation. Catch basins to be cleaned when capacity is reduced by 25%. The owner shall contract with a qualified landscape contractor to inspect and clean out accumulation of trash, litter and sediment and check for evidence of illegal dumping of waste materials into on-site drains.	Shall be inspected monthly during the rainy season (October-May) and before and after each storm to ensure proper operation.

N15 Vacuum Sweeping of Private Streets and Parking Lots SC-43 Parking/Storage Area Maintenance	Owner	Parking lots shall be swept utilizing a vacuum sweeper weekly to prevent sediment, garden waste, and trash, or other pollutants from entering on-site drains and public storm channels. Vacuum sweeping will be done by a landscape contractor or other contractor provided by the owner.	Weekly
S1 Storm Drain Stencil SD-13 Storm Drain Systems Signs	Owner	A painted message "No Dumping-Drains to Ocean" shall be placed on each catch basin. The message shall be inspected for legibility annually & repainted as necessary.	Shall be inspected for legibility annually and repainted as necessary.
S3 Trash and Waste Storage Areas SD-32 Trash Enclosures	Owner	Trash enclosure to be inspected for debris and leaking roof. Pick up debris and sweep daily. Repairs to be made upon inspection.	Inspect and repair weekly at minimum. Clean daily.
S4 Efficient Irrigation Systems and Landscape Design	Owner	Implement landscape plans consistent with county water conservation resolutions, which shall include provision of weather-based controllers, rain shutoff devices, drip irrigation heads and recessed finish grade of all landscape areas. Inspect irrigation system for leaks. Observe landscape and adjust watering for plant's needs.	Be inspected bi-weekly after each landscape procedure.
S5 Finish Grade of Landscape	Owner	Landscape to be inspected for depression of 1-2".	Be inspected bi-weekly after each landscape procedure.
S6 Protect Slopes and Channels	Owner	Rip-rap pads to be kept clean of debris and sedimentations.	At the beginning of the wet season and as necessary
Underground Infiltration System	Owner	Observe drawdown time for a storm after completion or following maintenance of the facility, to confirm that the drawdown time (48 hours) has been obtained.	Quarterly and after storm events
MP-51 Vortex Separator	Owner	The Owner shall enter into a contract with a qualified contractor to inspect and maintain the Hydrodynamic Separator unit.	Inspection and Maintenance to be performed quarterly during the first year, and bi-annually thereafter.

Section 6 WQMP Attachments

6.1. Site Plan and Drainage Plan

Include a site plan and drainage plan sheet set containing the following minimum information:

- Project location
- Site boundary
- Land uses and land covers, as applicable
- Suitability/feasibility constraints
- Structural Source Control BMP locations
- Site Design Hydrologic Source Control BMP locations
- LID BMP details
- Drainage delineations and flow information
- Drainage connections

6.2 Electronic Data Submittal

Minimum requirements include submittal of PDF exhibits in addition to hard copies. Format must not require specialized software to open. If the local jurisdiction requires specialized electronic document formats (as described in their local Local Implementation Plan), this section will describe the contents (e.g., layering, nomenclature, geo-referencing, etc.) of these documents so that they may be interpreted efficiently and accurately.

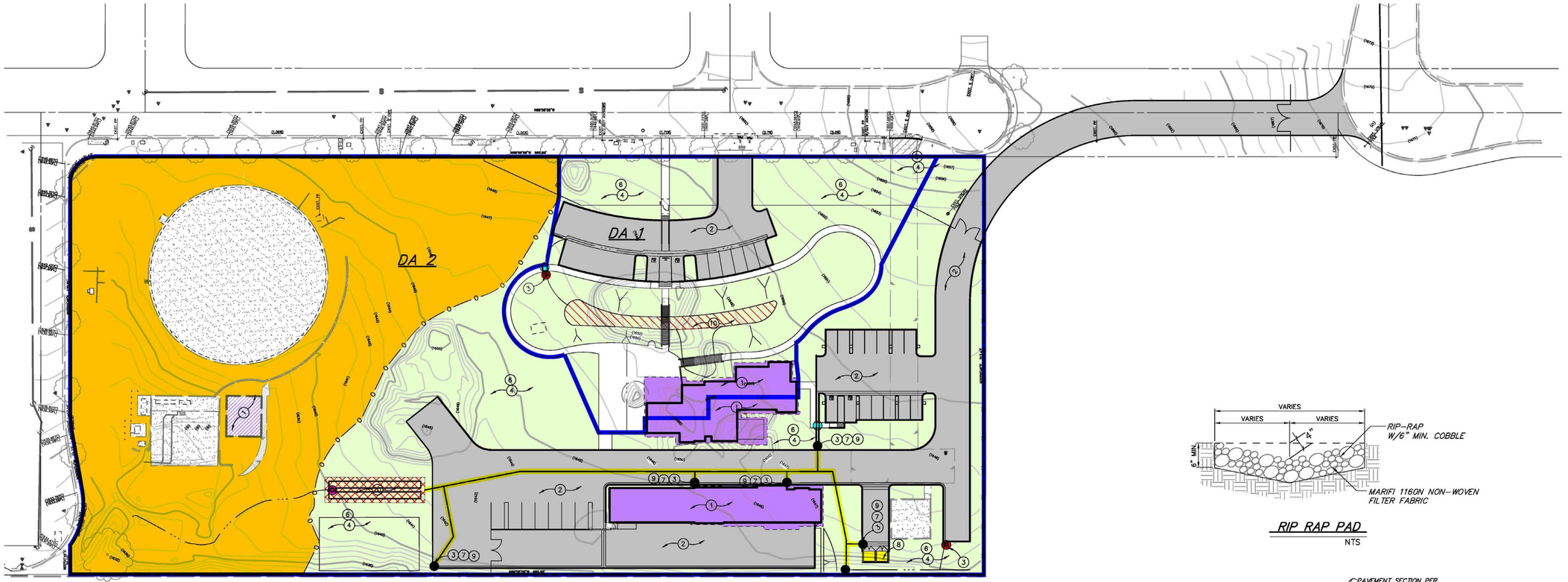
6.3 Post Construction

Attach all O&M Plans and Maintenance Agreements for BMP to the WQMP.

6.4 Other Supporting Documentation

- BMP Educational Materials
- Activity Restriction – C, C&R's & Lease Agreements

6.1
Site Plan & Drainage Plan



LEGEND

- LANDSCAPE
- AC PAVEMENT
- CONCRETE/SIDEWALK
- BUILDING
- TRASH ENCLOSURE
- TRASH ENCLOSURE
- UNDERGROUND STORAGE INFILTRATION SYSTEM
- INFILTRATION BASIN
- DRAINAGE AREA BOUNDARY
- PROP. STORM DRAIN
- DRAINAGE FLOW
- ROOF DRAIN
- PROP. RIP-RAP PAD
- PROP. MANHOLE
- PROP. CATCH BASIN W/ FOSSIL FILTER
- PROP. UNDERWALK DRAIN

BMP LEGEND

1	SC-42	BUILDING REPAIR AND CONSTRUCTION
2	SC-43	PARKING/STORAGE AREA MAINTENANCE
3	SC-44	DRAINAGE MAINTENANCE
4	SC-73	LANDSCAPE MAINTENANCE
5	SD-11	ROOF RUNOFF CONTROLS
6	SD-12	EFFICIENT IRRIGATION
7	SD-13	STORM DRAIN SIGNAGE
8	SD-32	TRASH ENCLOSURES
9	MP-52	DRAIN INSERT
10	TC-10	INFILTRATION TRENCH

SC-10	NON-STORMWATER DISCHARGES
SC-11	SPILL PROTECTION, CONTROL AND CLEANUP
SC-41	BUILDING & GROUND MAINTENANCE
SC-60	HOUSEKEEPING PRACTICES
SC-10	SITE DESIGN & LANDSCAPE PLANNING

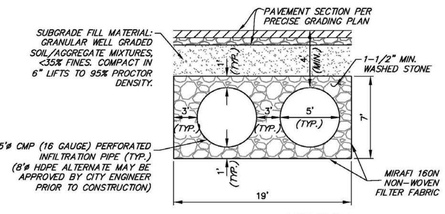
AREAS

DA 1
TOTAL AREA 45,262 SF
IMPERVIOUS AREA: 18,157 SF
PERVIOUS AREA: 27,105 SF

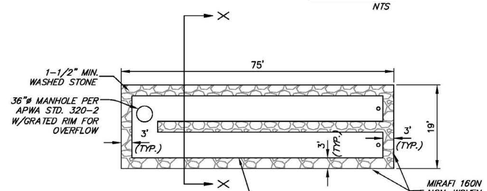
DA 2
TOTAL AREA 169,059 SF
IMPERVIOUS AREA: 64,760 SF
PERVIOUS AREA: 104,299 SF

STORAGE VOLUME		
AREA	DCV REQ'D	VOL. PROV.
DA 1	2,011CF	6,408CF
DA 2	7,243 CF	7,530CF

RIP RAP PAD
NTS

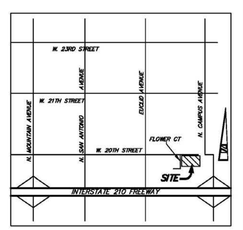


SECTION
NTS

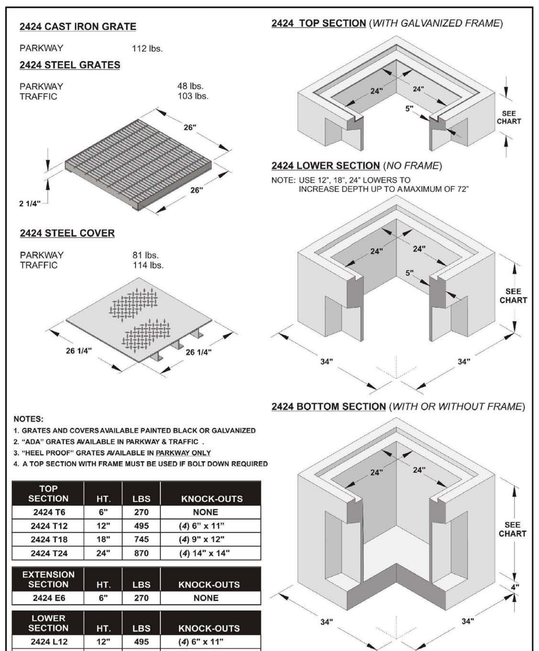


PLAN
NTS

UNDERGROUND INFILTRATION SYSTEM
NTS



VICINITY MAP
N.T.S.



NOTES:
1. GRATES AND COVERS AVAILABLE PAINTED BLACK OR GALVANIZED
2. "ADA" GRATES AVAILABLE IN PARKWAY & TRAFFIC .
3. "HEEL PROOF" GRATES AVAILABLE IN PARKWAY ONLY
4. A TOP SECTION WITH FRAME MUST BE USED IF BOLT DOWN REQUIRED

TOP SECTION	HT.	LBS	KNOCK-OUTS
2424 T6	6"	270	NONE
2424 T12	12"	495	(4) 6" x 11"
2424 T18	18"	745	(4) 9" x 12"
2424 T24	24"	870	(4) 14" x 14"

EXTENSION SECTION	HT.	LBS	KNOCK-OUTS
2424 E6	6"	270	NONE

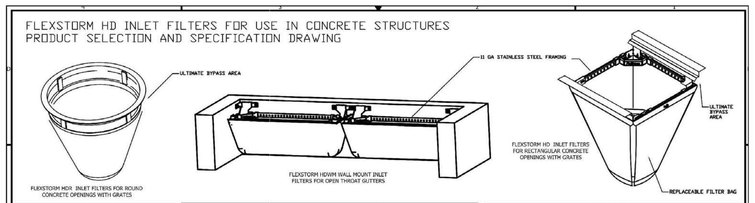
LOWER SECTION	HT.	LBS	KNOCK-OUTS
2424 L12	12"	495	(4) 6" x 11"
2424 L18	18"	745	(4) 9" x 12"
2424 L24	24"	870	(4) 14" x 14"

BOTTOM SECTION	HT.	LBS	KNOCK-OUTS
2424 B30	30"	1595	(4) 18" x 18"
2424 B36	36"	1905	(4) 18" x 18"

24" x 24" CATCH BASIN
ORIG ISSUE DATE 11-23-99
REV DATE 02-28-00
BROOKS PRODUCTS
2424 CB

24"x24" CATCH BASIN
NTS

FLEXSTORM HD INLET FILTERS FOR USE IN CONCRETE STRUCTURES
PRODUCT SELECTION AND SPECIFICATION DRAWING



FLEXSTORM HDR Round Concrete Openings with Grates	
Drop Thru Opening Size Dia	Flexstorm Frame P/N
Small: 10.0" - 18.0"	62SHDR
Medium: 18.1" - 24.0"	62MHDR
Large: 24.1" - 36.0"	62LHDR

FLEXSTORM HDWM (Wall Mount) For Open Throat Curb Inlets - Mounted to Wall Beneath Curb Opening	
Curb Opening Size	Flexstorm Frame P/N
Up to 4' curb openings (1 Filter and Mounting Hardware)	62HDWM1
Between 4' and 8' curb openings (2 Filters and Mounting Hardware)	62HDWM2
Between 8' and 12' curb openings (3 Filters and Mounting Hardware)	62HDWM3
Between 12' and 16' curb openings (4 Filters and Mounting Hardware)	62HDWM4

FLEXSTORM HD For Rectangular/Square Concrete Openings with Grates	
Clear Drop Thru Opening Size (not grate or seat size)	Flexstorm Frame P/N
Small: 12" x 17" up to 16" x 17" (or 64" max perimeter)	62SHD
Medium: 18" x 18" up to 24" x 24" (or 96" max perimeter)	62MHD
Large: 26" x 26" up to 30" x 30" (or 120" max perimeter)	62LHD
XL: 32" x 32" up to 48" x 48" (or 192" max perimeter) typ 2 pc set	62XLHD

CREATE YOUR ADS FLEXSTORM PART NUMBER BY COMBINING FRAME P/N AND BAG P/N
1. IDENTIFY YOUR FLEXSTORM FRAME PART NUMBER FROM TABLES ABOVE
2. SELECT YOUR BAG PART NUMBER BASED ON APPLICATION NEEDS

FLEXSTORM FILTER BAGS	(22" depth) STD Bag P/N	(12" depth) Short Bag P/N	Clean Water Flow Rate (GPM/SqFt)	Min A.O.S. (US Sieve)
FX: Standard Woven Bag	FX	FX-S	200	40
FX+: Woven w/ MyCelx	FXP	FXP-S	200	40
FXO: Woven w/ Oil Boom	FXO	FXO-S	200	40
PC: Post Construction Bag	PC	PC-S	137	140
PC+: PC Bag w/ MyCelx	PCP	PCP-S	137	140
LL: Litter and Leaf Bag	LL	LL-S	High	3.5
IL: IDOT Non-Woven Bag	IL	IL-S	145	70

3. CREATE YOUR FINAL PART NUMBER TO INCLUDE ON YOUR SPECIFICATION PLANS

Frame P/N from Step 1.	Filter Bag P/N from Step 2.

SPECIFICATIONS FOR STANDARD BAGS BY NOMINAL BAG / FRAME SIZE

Nominal Bag Size Matched to Frame Size	Solids Storage (CuFt)	Filtered Flow Rate at 50% Max (CFS) FX (Woven)	PC (Post Constr)	IL (NonWoven)	*PC Oil Retention (Qz)	**PC+ Oil Retention (Qz)	**FX+ Oil Retention (Qz)
Small	1.6	1.2	0.8	0.9	79	168	89
Medium	2.1	1.7	1.2	1.3	115	204	89
Large	3.8	2.7	1.8	1.9	173	262	89
XL	4.2	3.6	2.4	2.6	230	319	178
Filtration Efficiency		82%	NA	Large scale 3rd party testing per ASTM D 7351 using 7% concentration USDA Sandy Loam			
TSS (total suspended solids rem)		NA	99%	Large Scale testing at 90 GPM using US Silica OK-110 sand at 1753 mg/L measuring TSS per SM 2540C.			
TPH (tot petroleum hydrocarbons)		NA	96%	Large Scale testing at 90 GPM with used motor oil at 243 mg/L measuring per EPA Method 1664A.			

* PC filter bag at 50% max adsorption capacity
** PC filter bag at 50% capacity and MyCelx skimmer at 100% capacity

NOTES:
1. ALL HD FRAMING IS CONSTRUCTED OF 304 STAINLESS STEEL FOR 25 YEAR LIFE RATING
2. TOTAL BYPASS CAPACITY: BYPASS CAPACITY WILL VARY WITH EACH SIZE DRAINAGE STRUCTURE. FLEXSTORM DESIGNS FRAMING BYPASS TO MEET OR EXCEED THE DESIGN FLOW OF THE PARTICULAR DRAINAGE STRUCTURE
3. UPON ORDERING CONFIRMATION OF THE DOT CALLOUT, PRECAST MAKE AND MODEL, OR DETAILED DIMENSIONAL FORMS MUST BE PROVIDED TO CONFIGURE AND ASSEMBLE YOUR CUSTOMIZED FLEXSTORM INLET FILTER; PART NUMBER ALONE IS NOT SUFFICIENT

GENERAL INSTALLATION INSTRUCTIONS:
1. REMOVE GRATE
2. DROP FLEXSTORM INLET FILTER ONTO LOAD BEARING LIP OF INLET STRUCTURE
3. REPLACE GRATE

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(630) 355-3477 FX
INFO@INLETFILTERS.COM

SIZE	DWG NO	REV
C	FLEXSTORM_HD	
SCALE	SHEET 1 OF 1	

FLEXSTORM INLET FILTER
NTS

40 0 40 80 120
SCALE: 1"=40'

LAND DEVELOPMENT DESIGN COMPANY, LLC
2313 E. Philadelphia St., Ste. F
Ontario, CA 91761
(909) 930-1468 · FAX (909) 930-1468
PLANNING · CIVIL · SURVEYING

REGISTERED PROFESSIONAL ENGINEER
KEVIN J. RICHER
No. 43714
Exp. 3/31/2021
CIVIL
STATE OF CALIFORNIA

BENCHMARK

REVISIONS:

PREPARED UNDER THE SUPERVISION OF:
KEVIN J. RICHER
R.C.E.43714 LIC. EXP. 3/31/2025 DATE

APPROVED BY:
DATE

WQMP EXHIBIT

SITE:
SAN ANTONIO WATER
400 E. 20TH STREET
UPLAND, CA 91784

PREPARED FOR:
ERICK PETERSON
401 E. COLUMBIA AVE.
POMONA, CA 91767

DATE: 9/11/2024	JOB NO. 6773
DRAWN BY: RAS	SCALE 1"=40'
DESIGNED BY: KJR	SHEET 1 OF 1 SHEETS
CHECKED BY:	

6.2
Electronic Data Submittal

6.3
Post Construction

6.4
Other Supporting Documentation

NOAA Atlas 14, Volume 6, Version 2
Location name: Fontana, California, USA*
Latitude: 34.0761°, Longitude: -117.489°
Elevation: 1074 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.104 (0.087-0.127)	0.137 (0.114-0.167)	0.182 (0.151-0.222)	0.220 (0.181-0.270)	0.274 (0.218-0.348)	0.317 (0.246-0.411)	0.362 (0.274-0.482)	0.410 (0.302-0.563)	0.479 (0.338-0.685)	0.535 (0.364-0.793)
10-min	0.150 (0.125-0.181)	0.197 (0.164-0.239)	0.261 (0.217-0.318)	0.315 (0.260-0.387)	0.392 (0.312-0.498)	0.454 (0.353-0.589)	0.519 (0.393-0.691)	0.588 (0.433-0.806)	0.686 (0.484-0.982)	0.766 (0.522-1.14)
15-min	0.181 (0.151-0.219)	0.238 (0.198-0.289)	0.316 (0.262-0.384)	0.381 (0.314-0.468)	0.474 (0.377-0.603)	0.549 (0.427-0.713)	0.627 (0.476-0.835)	0.711 (0.524-0.975)	0.830 (0.586-1.19)	0.927 (0.631-1.38)
30-min	0.270 (0.225-0.327)	0.355 (0.295-0.431)	0.471 (0.391-0.573)	0.569 (0.468-0.698)	0.707 (0.562-0.898)	0.818 (0.636-1.06)	0.935 (0.709-1.24)	1.06 (0.781-1.45)	1.24 (0.873-1.77)	1.38 (0.941-2.05)
60-min	0.395 (0.330-0.479)	0.520 (0.433-0.631)	0.689 (0.572-0.839)	0.833 (0.685-1.02)	1.04 (0.823-1.32)	1.20 (0.932-1.56)	1.37 (1.04-1.82)	1.55 (1.14-2.13)	1.81 (1.28-2.59)	2.02 (1.38-3.00)
2-hr	0.597 (0.498-0.724)	0.771 (0.642-0.936)	1.00 (0.834-1.22)	1.20 (0.987-1.47)	1.47 (1.17-1.87)	1.68 (1.31-2.19)	1.91 (1.45-2.54)	2.14 (1.58-2.94)	2.47 (1.74-3.53)	2.73 (1.86-4.05)
3-hr	0.763 (0.636-0.925)	0.980 (0.816-1.19)	1.27 (1.05-1.54)	1.50 (1.24-1.85)	1.83 (1.46-2.33)	2.09 (1.62-2.71)	2.35 (1.78-3.13)	2.63 (1.94-3.60)	3.01 (2.12-4.31)	3.31 (2.26-4.91)
6-hr	1.09 (0.910-1.32)	1.40 (1.16-1.70)	1.80 (1.49-2.19)	2.12 (1.75-2.61)	2.56 (2.04-3.26)	2.90 (2.26-3.77)	3.24 (2.46-4.32)	3.59 (2.65-4.93)	4.07 (2.87-5.82)	4.44 (3.02-6.58)
12-hr	1.44 (1.20-1.75)	1.87 (1.56-2.27)	2.42 (2.00-2.94)	2.85 (2.34-3.49)	3.42 (2.72-4.34)	3.84 (2.99-4.99)	4.26 (3.23-5.68)	4.69 (3.45-6.42)	5.24 (3.70-7.51)	5.67 (3.86-8.40)
24-hr	1.94 (1.72-2.24)	2.57 (2.27-2.96)	3.35 (2.95-3.88)	3.96 (3.47-4.62)	4.76 (4.03-5.73)	5.34 (4.43-6.57)	5.91 (4.79-7.45)	6.48 (5.10-8.39)	7.21 (5.45-9.72)	7.75 (5.67-10.8)
2-day	2.36 (2.09-2.72)	3.19 (2.82-3.68)	4.26 (3.75-4.92)	5.10 (4.46-5.94)	6.21 (5.26-7.48)	7.03 (5.83-8.65)	7.85 (6.36-9.89)	8.67 (6.84-11.2)	9.75 (7.38-13.2)	10.6 (7.73-14.7)
3-day	2.58 (2.28-2.97)	3.54 (3.13-4.09)	4.79 (4.23-5.55)	5.80 (5.07-6.76)	7.15 (6.05-8.62)	8.17 (6.78-10.1)	9.20 (7.45-11.6)	10.2 (8.08-13.3)	11.7 (8.82-15.7)	12.7 (9.31-17.8)
4-day	2.79 (2.47-3.22)	3.88 (3.43-4.48)	5.30 (4.68-6.14)	6.46 (5.65-7.53)	8.02 (6.79-9.66)	9.21 (7.64-11.3)	10.4 (8.44-13.1)	11.7 (9.19-15.1)	13.3 (10.1-18.0)	14.6 (10.7-20.4)
7-day	3.22 (2.85-3.71)	4.54 (4.01-5.24)	6.28 (5.53-7.26)	7.70 (6.74-8.98)	9.65 (8.17-11.6)	11.2 (9.25-13.7)	12.7 (10.3-16.0)	14.3 (11.3-18.5)	16.5 (12.5-22.2)	18.2 (13.3-25.4)
10-day	3.49 (3.09-4.02)	4.95 (4.38-5.71)	6.90 (6.08-7.98)	8.50 (7.44-9.92)	10.7 (9.07-12.9)	12.4 (10.3-15.3)	14.2 (11.5-17.9)	16.1 (12.7-20.8)	18.6 (14.1-25.1)	20.6 (15.1-28.7)
20-day	4.10 (3.63-4.72)	5.90 (5.22-6.82)	8.35 (7.36-9.66)	10.4 (9.10-12.1)	13.3 (11.2-16.0)	15.6 (12.9-19.1)	17.9 (14.5-22.6)	20.5 (16.1-26.5)	24.0 (18.1-32.3)	26.8 (19.6-37.4)
30-day	4.83 (4.27-5.56)	6.97 (6.17-8.05)	9.91 (8.74-11.5)	12.4 (10.9-14.5)	15.9 (13.5-19.2)	18.8 (15.6-23.1)	21.8 (17.6-27.4)	25.0 (19.7-32.3)	29.5 (22.3-39.7)	33.1 (24.2-46.2)
45-day	5.69 (5.04-6.56)	8.17 (7.23-9.43)	11.6 (10.2-13.4)	14.6 (12.7-17.0)	18.8 (15.9-22.6)	22.2 (18.4-27.3)	25.9 (21.0-32.6)	29.8 (23.5-38.6)	35.5 (26.8-47.9)	40.1 (29.3-56.0)
60-day	6.69 (5.92-7.71)	9.48 (8.38-10.9)	13.4 (11.8-15.5)	16.8 (14.7-19.6)	21.7 (18.3-26.1)	25.7 (21.3-31.6)	30.0 (24.3-37.8)	34.7 (27.3-44.9)	41.5 (31.4-55.9)	47.1 (34.4-65.7)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical

Worksheet H: Factor of Safety and Design Infiltration Rate and Worksheet

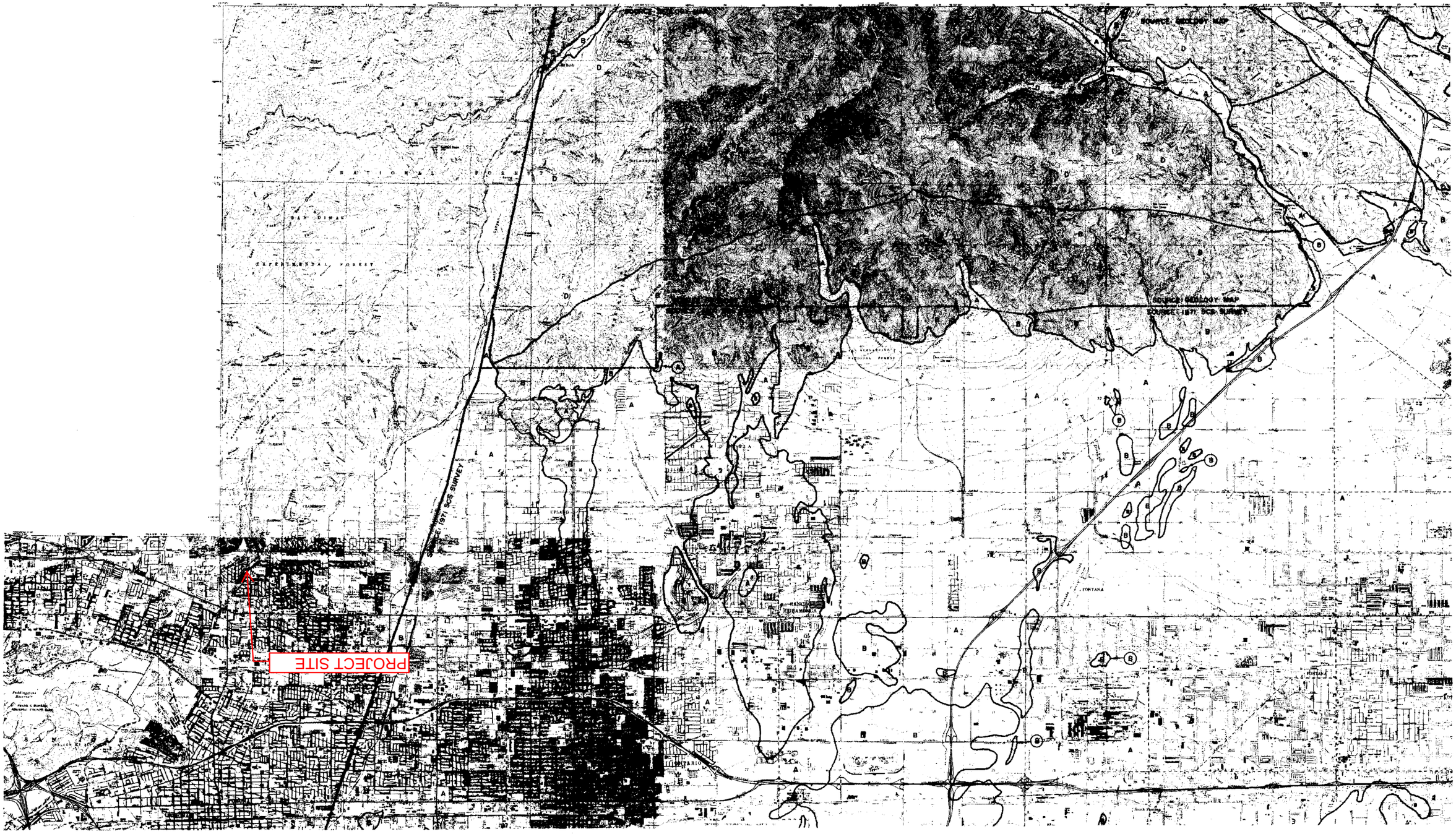
Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	1	0.25
		Predominant soil texture	0.25	1	0.25
		Site soil variability	0.25	1	0.25
		Depth to groundwater / impervious layer	0.25	1	0.25
		Suitability Assessment Safety Factor, S_A = Lp			1.00
B	Design	Tributary area size	0.25	3	0.75
		Level of pretreatment/ expected sediment loads	0.25	3	0.75
		Redundancy	0.25	3	0.75
		Compaction during construction	0.25	1	0.25
		Design Safety Factor, S_B = Lp			2.50
Combined Safety Factor, S_{TOT}= S_A x S_B					3.00
Measured Infiltration Rate, inch/hr, K_M (corrected for test-specific bias)					12.71
Design Infiltration Rate, in/hr, K_{DESIGN} = S_{TOT} × K_M					4.23

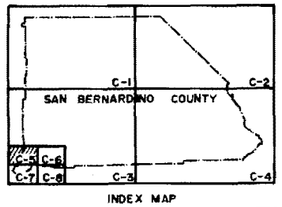
Supporting Data

Briefly describe infiltration test and provide reference to test forms:

See Section 6.4 of the project WQMP for project Geotechnical Engineering Investigation by Soils Southwest

Note: The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.0.





INDEX MAP

LEGEND
SOIL GROUP BOUNDARY
A SOIL GROUP DESIGNATION
BOUNDARY OF INDICATED SOURCE

SCALE 1:48,000

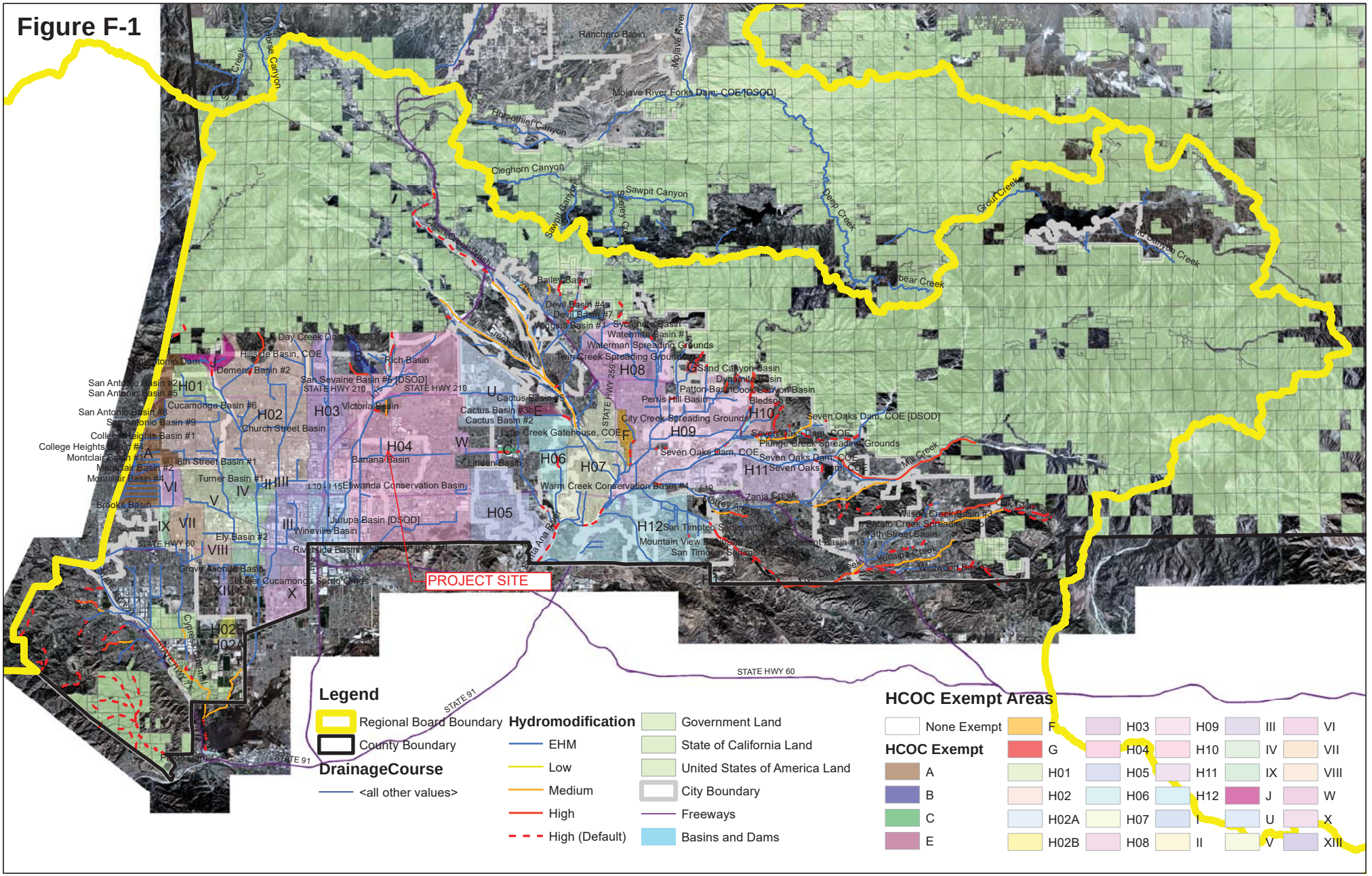
SCALE REDUCED BY 1/2

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

HYDROLOGIC SOILS GROUP MAP
FOR
SOUTHWEST-A AREA

FIGURE C-13

Figure F-1


PROJECT SITE
Ranchero Basin
Mojave River
Mojave River Forks Dam, COE [DSOD]
Horsethief Canyon
Cleghorn Canyon
Sawpit Canyon
Sawmill Canyon
Deep Creek
Grout Creek
Bear Creek
Bailey Basin
Devil Basin #4
Devil Basin #7
Wiggins Basin #1
Sycamore Basin
Waterman Basin #1
Waterman Spreading Grounds
Twin Creek Spreading Grounds
Day Creek Dam [DSOD]
Hillside Basin, COE
Rich Basin
Demens Basin #2
San Sevaine Basin #5 [DSOD]
STATE HWY 210
San Antonio Basin #2
San Antonio Basin #5
Cucamonga Basin #6
San Antonio Basin #8
San Antonio Basin #9
College Heights Basin #1
College Heights Basin #4
Montclair Basin #1A
Montclair Basin #2
Montclair Basin #4
8th Street Basin #1
Turner Basin #1
Brooks Basin
Church Street Basin
Victoria Basin
Banana Basin
Cactus Basin #5
Cactus Basin #3b
Cactus Basin #2
Lytle Creek Gatehouse, COE
Linden Basin
Etiwanda Conservation Basin
Warm Creek Conservation Basin #4
Jurupa Basin [DSOD]
Wineville Basin
Riverside Basin
Ely Basin #2
Grove Avenue Basin
Lower Cucamonga Sprdg Grnds
Sand Canyon Basin
Dynamite Basin
Patton Basin
Cook Canyon Basin
Bledsoe Basin
Perris Hill Basin
City Creek Spreading Grounds
Seven Oaks Dam, COE [DSOD]
Seven Oaks Dam, COE
Plunge Creek Spreading Grounds
Seven Oaks Dam, COE
Seven Oaks Dam, COE
Mill Creek
Zanja Creek
Wilson Creek Basin #3
Cerrato Creek Spreading Basin
13th Street Basin
Yucaipa Creek
Wildwood Basin
San Timoteo Sediment Basin #3
San Timoteo Sediment Basin #13
Mountain View Basin
San Timoteo Sediment Basin
Grey Arroyo
Oak Glen Cr
Lytle Creek Wash
Canyon Creek Wash
Deep Creek
Bear Canyon Creek
Santa Ana River
Cypress Channel
STATE HWY 60
STATE 91
STATE HWY 259
I-10
I-15
H01
H02
H02A
H02B
H03
H04
H05
H06
H07
H08
H09
H10
H11
H12
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U
W
X
I
II
III
IV
V
VI
VII
VIII
IX
X
XIII
Legend
Regional Board Boundary
County Boundary
DrainageCourse
<all other values>
Hydromodification
EHM
Low
Medium
High
High (Default)
Government Land
State of California Land
United States of America Land
City Boundary
Freeways
Basins and Dams
HCOC Exempt Areas
None Exempt
HCOC Exempt
A
B
C
E
F
G
H01
H02
H02A
H02B
H03
H04
H05
H06
H07
H08
H09
H10
H11
H12
I
II
III
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V
VI
VII
VIII
IX
X
XIII
J
U
W

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897 VIA LATA, SUITE N • COLTON, CA 92324 • (909) 370-0474 • (909) 370-0481 • FAX (909) 370-3156

Report of Geotechnical Evaluations and Soils Infiltration Testing for WQMP-BMP Stormwater Disposal Design

Planned New San Antonio Water District Headquarters Office and Maintenance Facility
400 E. 20th Street
Upland, CA
APN: 1044-091-22

Project No. 24036-F/BMP

August 28, 2024

Prepared for:

CEDG, Inc.
c/o Mr. Erik Peterson
401 E. Columbia Avenue
Pomona, CA 91767

soilssouthwest@aol.com
Established 1984

SOILS SOUTHWEST, INC.

SOILS, MATERIALS AND ENVIRONMENTAL ENGINEERING CONSULTANTS

897 VIA LATA, SUITE N • COLTON, CA 92324 • (909) 370-0474 • (909) 370-0481 • FAX (909) 370-3156

August 28, 2024 Project No.24001-F/BMP

CEDG, Inc.
401 E. Columbia Avenue
Pomona, CA 91767

Attention: Mr. Erik Peterson

Subject: Report of Geotechnical Evaluations and
Soils Infiltration Rates for WQMP-BMP Stormwater Disposal Design
Planned New San Antonio Water District Headquarters Office and Maintenance Facility
400 E. 20th Street
Upland, CA
APN: 1044-091-22

Reference: Preliminary Site Plan Provided by Addressee

Dear Mr. Peterson,

Presented herewith is the report of (i) Geotechnical Evaluations and (ii) Soils Infiltration Rates for WQMP-BMP Stormwater Disposal Design proposed for the planned new administrative office and maintenance structures, parking, along with shallow depth basin and underground infiltration disposal systems to be located 400 East 20th Street, Upland, California. In absence of detailed development plans review, the opinions and recommendations included should be considered as "preliminary". Revised and/or updated recommendations may be warranted following precise grading and development plans review.

Based on the referenced site plan, it is understood that the subject development will primarily include two new near grade structures including one maintenance shop and one administrative office structure. Construction of wood and stucco, concrete tilt-up or concrete framed, or concrete block construction with concrete slabs-on-grade is assumed. Supplemental construction is to include on-site driveways and parking and paving for auto/heavy-duty truck traffic , along with the installation of a couple WQMP-BMP stormwater disposal systems to complete the project. Moderate site preparations and grading should be expected. For estimation purposes, the anticipated structural loadings of 80 kips and 8 klf are assumed for isolated column and conventional wall spread foundations, respectively.

Based on the test explorations and laboratory testing completed at this time, it is our opinion that the soils encountered primarily consist of upper 3 feet of variegating layers of gravels and silty fine to medium coarse gravel sand mixtures with high concentrations of rocks, cobbles, and occasional small boulders to the refusal depth of 3 feet explored. Descriptions of the soils encountered are provided in the attached Log of Borings.

No shallow-depth groundwater or impermeable layers were encountered. Historical and shallow-depth groundwater is reported at approximately 267 feet below grade as measured at the nearest water well, 01N07W28N002S. Based on such, and as described in the Special Publication SP117, published by the State of California Department of Conservation, Division of Mines and Geology, it is our opinion that the site is considered non-susceptible to seismically induced soils liquefaction thereby requiring no special geotechnical design recommendations other than those as recommended herein.

Based on review of the available USGS (California Geologic Survey) publication, it is understood that the site is not situated within an A-P Special Studies Zone where a known seismic fault passes through the site or its adjacent. Supplemental information is provided in Appendix C.

Following review of the online FEMA National Flood Hazard Layer Mapping, it is understood that the project site is classified as a Zone X, Area of Minimal Flood Hazard.

Based on the evaluations completed at this time, it is our opinion that from a geotechnical viewpoint, the site should be considered suitable for the proposed development provided that the recommendations and opinions included are considered in design and construction.

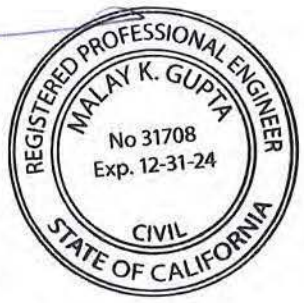
Final grading and detailed development plan review is suggested to verify the applicability of the certain assumptions as used in preparing this report.

This report has been substantiated by subsurface explorations and mathematical analysis made in accordance with the generally accepted engineering principles, including those field and laboratory testing considered necessary in the circumstances.

We offer no other warranty, expressed or implied.

Respectfully submitted,
Soils Southwest, Inc.

Malay Gupta, RCE 31708



John Flippin
Project Coordinator

1.0 Introduction

1.1 Purpose and Scope of Work

This report presents the results of (i) Geotechnical Evaluations and (ii) Soils Infiltration Testing for WQMP-BMP Stormwater Disposal System Design for the new administrative office and maintenance structures, parking, along with shallow depth and underground infiltration design systems to be located 400 East 20th Street, Upland, California. In absence of precise grading and/or detailed development plans, the recommendations and opinions included may require updating and revisions recommendations following detailed development plans review.

The soils encountered as described herein are based on visual observations made during test explorations, supplemented by the necessary laboratory testing completed at this time. Being beyond scope of work, no geologic investigations or Phase I Environmental Site Assessment (ESA) are included. Reports of such will be supplied upon request.

The recommendations contained reflect our best estimate of the soils' conditions as encountered during field explorations as conducted for the site. It is not to be considered as a warranty of the soils' conditions for other areas or for the depth beyond the explorations advanced at this time.

The recommendations supplied should be considered valid and applicable following review of the final grading and development plans when supplied and when the following conditions are observed:

i. Pre-grade meeting with the contractor, public agency, and the geotechnical engineer,
ii. Excavated bottom inspections and verifications by the geotechnical engineer prior to backfill placement,
iii. Continuous observations and testing during site preparation and structural fill soils placement,
iv. Observation and inspection of footing trenching prior to steel and concrete placement,
v. Plumbing trenches backfill placement prior to concrete slab-on-grade placement,
vi. On and off-site utility trenches backfill testing and verifications, and
vii. Consultations as required during construction or upon your request.

1.2 Site Description

The rectangular shaped subject parcel of 4.92 acres is currently a water district yard facility in operation . In general, the site is bounded by East 20th Street to the north, by Interstate 210 Freeway on the south, by vacant undeveloped property on the east, and by Flower Court on the west. Following review of the available site drawings, overall vertical relief within the property is unknown, however, based on site reconnaissance, sheet flow from incidental rainfall is estimated to flow towards the south and southwest. Other than an existing reservoir tank, pump station, and numerous soil, rock, and asphalt debris stockpiles in the center portion of the property, along with a satellite tower at the southeast corner, presence of no other significant features were noted.

1.3 Proposed Development

No precise grading and/or detailed development plans are available for review; however, it is understood that the subject development will primarily include two (2) structures near existing grade to accommodate, among others, a maintenance building and an administrative office. Use of wood and stucco framed, concrete block, or metal framed construction with concrete slabs-on-grade is assumed. Supplemental construction is anticipated to include on-site driveways, parking and paving, along with the installation of two (2) WQMP-BMP stormwater disposal systems. Considering existing offsite paving, curb-gutter, and drive approaches, off-site street improvements is not anticipated at this time.

Moderate site preparations and grading are anticipated as described in the following sections.

1.4 Subsurface Investigation

The geotechnical evaluations include subsurface explorations, soil sampling, necessary laboratory testing, engineering analyses, and preparation of this report. Being beyond scope of work, no geologic investigations or Phase I Environmental Site Assessments are included. Reports on such will be supplied on request.

In general, our scope of work included the following: review of the referenced site plan supplied along with three (6) test borings (B-1 to B-6) explored by using a Hollow-Stem Auger (HSA) drill rig advanced to the refusal depth of 3 feet below grade along with four (4) infiltration test borings to maximum depths between 3 and 8 feet (P-1 and P-4) as requested for WQMP-BMP Stormwater Disposal Design. During explorations, the soils encountered were continuously logged, bulked, and undisturbed samples were procured and recorded. Collected samples were subsequently transferred to our laboratory for necessary geotechnical testing.

Descriptions of the soils encountered are provided on the attached Log of Borings. Approximate test locations are shown on the attached Plate A.

- Laboratory testing conducted on the selected bulk and undisturbed samples were programmed according to the project requirements. The laboratory testing included determinations of:
    - Moisture Density Determination (ASTM D2216),
    - Maximum Dry Density and Optimum Moisture Content (ASTM D1557),
    - Soils' Peak and Residual Shear Strengths (ASTM D3080),
    - Soils' Consolidation Characteristics (ASTM D2435),
    - Soils' Sieve Analyses (ASTM D422),
    - Soils' R-value (ASTM D2844), and
    - Soils' Sand Equivalent, SE (ASTM D2419).

- Based on the field investigation and laboratory testing completed the necessary engineering analyses and evaluations were made on which to base our preliminary recommendations for foundation design, slab-on-grade, site preparations and grading, utility trenches backfill, and

- Preparation of this report for initial use by the project design professionals.

The recommendations supplied should be considered "tentative" and may require revisions and/or upgrading following final grading and detailed development plans review.

2.0 Geotechnical Evaluations

2.1 Site Soils Description

The soils encountered primarily consist of upper 3 feet of variegating layers of gravels and silty fine to medium coarse gravel sand mixtures with high concentrations of rocks, cobbles, and occasional small boulders to the refusal depth of 3 feet explored. Descriptions of the soils encountered are provided in the attached Log of Borings.

Based on review of the USDA Natural Resources Conservation Service: Web Soil Survey for the subject area, it is our understanding that the soil classification within the structural pad areas is identified as being SpC-Soboba stony loamy sand, 2 to 9 percent slopes with the upper 60 inches consisting of stony loamy stand and very stony sands below existing grade, whereas the soils within the planned underground infiltration disposal system at the southwest portion of the property being classified as HaC-Hanford coarse sandy loam, 2 to 9 percent slopes consisting of sandy loam and fine sandy loam up to five (5) feet below existing grade. Following review of the Geological Map of the Mount Baldy Quadrangle (2002), the project site is designated as consisting of Qg alluvial gravel and sand of stream channels.

Based on review of the available USGS (California Geologic Survey) publications, it is understood that the site is not situated within an A-P Special Studies Zone where seismic fault passes through the site or its adjacent.

No groundwater or impermeable soils were encountered within the refusal depth of 3 feet explored. According to California Department of Water Resources, the historical groundwater level is at a depth of approximately 267 feet which is in excess of 50 feet below grade as measured at the nearest water well (01N07W28N002S) . Based on such and as described in the Special Publication SP117, published by the State of California Department of Conservation, Division of Mines and Geology, it is our opinion that the site is considered non-susceptible to seismically induced soils liquefaction.

Laboratory shear tests conducted on the upper soils remolded to 90% indicate "moderate" shear strengths under increased moisture conditions. Results of the laboratory shear tests are provided on Plate B.

Consolidation tests conducted on remolded samples indicate "slight" potential for compressibility along with slight to moderate hydro-collapse potential under anticipated static structural loadings with potential for "tolerable" settlements to footings and concrete slabs-on-grade. Areas of slight to moderate compressibility and/or hydro collapsible potential may require further excavation and/or compaction effort. Results of the laboratory determined soils consolidation potential are shown in Appendix B.

Fine to medium coarse to coarse sands with traces of silts along with rocks and cobbles encountered are considered "low" in expansion potential requiring no special construction requirements other than those as recommended herein. Supplemental soil expansion testing, however, is recommended following mass grading completion to provide supplemental/revised foundation recommendations, if warranted.

2.2 Subsurface Variations

During site preparations and grading, buried irrigation, debris, organic and others may be encountered. In addition, variations in soil strata, their continuity and orientations may be expected. Due to the deposition characteristics of the soils encountered, care should be exercised in interpolating or extrapolating the subsurface soils conditions existing in between and beyond the test explorations conducted.

2.3 Excavatibility

It is our opinion that the grading required for the project may be accomplished by using conventional heavy-duty construction equipment. No blasting or jackhammering should be warranted. However, considering the presence of high concentration of cobbles and boulders, it is suggested to use rocks no greater than 6-8 inches in compacted fills, but directly beneath footings and slabs should be avoided.

2.4 Soil Corrosivity

Reference Soil Sample B-1 @ 0-3 feet below grade

1. Chloride concentration equal to 29 mg/Kg does not exceed 10,000 ppm is non-corrosive to ferrous metals,
2. pH equal to 7.93 units exceeding 4.0 units is non-corrosive to buried metals,
3. Sulfate concentration equal to 82 mg/Kg does not exceed 2000 ppm is non-corrosive to concrete, and

4. Resistivity equal to 3,640 ohms/cm is "moderately" corrosive to buried metals.

Soil chemical test results are included in Appendix B.

It is suggested that following mass grading completions, soils corrosivity potential evaluations should be made to determine, at a minimum, concentrations of pH, sulfate, chloride, and resistivity. Further corrective recommendations should be provided by Corrosion Engineer.

2.5 Groundwater

No groundwater or bedrock was encountered within the refusal depth of 3 feet explored. However, following review of the available recorded groundwater well data as shown in the table below, historical groundwater was measured at approximately 267 feet below the existing well grade. The following table describes the historical and the current groundwater level as recorded in the nearest well as listed by the local reporting agency.

GROUNDWATER TABLE	
Reporting Agency	California Department of Water Resources Marcelo Montagna 2008 Maps http://wdl.water.ca.gov/waterdatalibrary/
Well Number	01N/07W-28N002S Cucamonga-1000547
Well Monitoring Agency	Chino Basin
Well Location: Township/Range/Section	T01N-R07W-Section 28
Well Elevation:	1675
Current Depth to Water (Measured in feet)	469
Current Date Water was Measured	March 26,2024
Depth to Water (Measured in feet) (Shallowest)	267
Date Water was Measured (Shallowest)	December 15,1983

Fluctuations in groundwater levels, however, can occur due to seasonal variations in the amount of rainfall, runoff, altered natural drainage paths, and other factors not evident at the time the test borings completed. Accordingly, for the planned development, it is our opinion that provisions should be maintained to dispose incidental surface runoff away from the individual structural pads, once constructed.

3.1 Faulting and Seismicity

Based on the information published by the USGS (currently known as California Geologic Survey) Department of Conservation, State of California, it is understood that the site is not situated within an A-P Special Study Zone where earthquake fault(s) runs through or adjacent to the subject site. In the absence of shallow (less than 50 feet) depth groundwater, the site is considered non-susceptible to soils liquefaction in the event of a strong motion earthquake. However, the site being within Southern California where potentials for seismically induced structural hazards could not be ignored, it is our opinion that implementation of the current CBC seismic design parameters in structural design as described herein may reduce the potential for seismically induced structural distress to some "acceptable" tolerable limits.

Seismically induced site-specific potential hazards are discussed in the following sections.

3.2 Direct or Primary Seismic Hazards

Surface ground rupture along with active fault zones and ground shaking represent primary or direct seismic hazards to structures. There are no known active or potentially active faults that pass through or towards the subject site and the site is not situated within an A-P Special Studies Zone. According to the current 2022 CBC, the site is considered situated within Seismic Zone 4. As a result, it is likely that during the life expectancy of the structures built, moderate to severe ground shaking may have some adverse effects to the structures built.

3.3 Induced or Secondary Seismic Hazards

In addition to ground shaking, effects of seismic activity may include surface rupture, flooding, landsliding, lateral spreading, settlements, and subsidence. Potential effects of such are as described below.

3.3.1 Liquefaction

Liquefaction is caused by build-up of excess hydrostatic pressure in saturated cohesionless soils due to cyclic stress generated by ground shaking during an earthquake. The significant factors on which liquefaction potential of a soil deposit depends, among others include, soil type, relative soil density, intensity of earthquake, duration of ground shaking, and depth of ground water.

No groundwater was encountered within the refusal depth of 3 feet explored. In absence of historically reported groundwater within 50 feet below grade, and based on review the Special Publication SP117, published by the State of California Department of Conservation, Division of Mines and Geology, it is our opinion that the site is considered non-susceptible to seismically induced soils liquefaction thereby requiring no special geotechnical design recommendations other than those as recommended herein.

3.3.2 Shallow Depth Ground Rupture

The site is not situated within an A-P Special Studies Zone. Based on review of the existing geologic information, no major fault is noted to cross through or extend towards the site. The potential for surface rupture resulting from nearby fault movement is not known for certainty; however, in our opinion it is considered "remote" due to the distance of the site to the recorded nearby earthquake fault.

3.3.3 Flooding

Flooding hazards include tsunamis (seismic sea waves), Seiches, or failure of manmade reservoirs, tanks, and aqueducts. The potential for these hazards is considered "remote" considering the inland site location and in absence of nearby known bodies of water. Based on review of the FEMA National Flood Hazard Layer FIRMette map, it is our understanding that the subject area is delineated as Zone X, Area of Minimal Flood Hazard on its eastern half while the western half is delineated as being in an area with "Reduced Flood Risk due to Levee as shown in the attached Appendix C.

3.3.4 Landslides

Seismically induced landslides and other slope failures are common occurrences during or soon after an earthquake. Considering the site and its adjacent being relatively flat, it is our opinion that potential for seismically induced landslides should be considered "remote".

3.3.5 Lateral Spreading

Seismically induced lateral spreading involves lateral movement of soils due to ground shaking. Lateral spreading is demonstrated by near vertical cracks with predominantly horizontal movement of the soil mass involved. The topography of the site being near level, it is our opinion that the potential for seismically induced lateral spreading should be considered "remote".

3.3.6 Seismically Induced Settlement

Considering the proximity of the earthquake fault as described, it is our opinion that potential for some total and differential settlements due to ground shaking may be anticipated as described herein.

3.4 Seismic Design Parameters

The design spectrum was developed based on the 2022 CBC. Site Coordinates of 34.135692°N, -117.645040°W were used to establish the seismic parameters presented below.

3.4.1 Seismic Design Coefficients

The site is situated at approximately 1.3 miles from the Cucamonga Fault capable of generating an earthquake magnitude, M of 6.7 and Peak Horizontal Ground Acceleration, PGA of 0.753g at 10% probability of exceedance in 50-year return period.

For foundation and structural design use of the following seismic parameters are suggested as based on the current 2022 CBC:

Recommended values are based upon the online review of ASCE 7-22 Hazard Tool coefficient parameters. The following presents the seismic design parameters evaluated based on the available publications published by California Geological Survey (CGS), 2022 CBC, and ASCE Standard 7-16.

TABLE 3.4.1 A1: Seismic Design Parameters

Seismic Source Type

Based on California Geological Survey-Probabilistic Seismic Hazard Assessment Peak Horizontal Ground Acceleration (PGA) having a 10% probability of exceedance in a 50-year period is described as below:

Seismic Source Type / Appendix C	
Nearest Maximum Fault Magnitude	M ≥ 6.7
Peak Horizontal Ground Acceleration (PGA)	0.753g

In design, vertical acceleration may be assumed to about 1/3 to 2/3 of the estimated horizontal ground accelerations (PGA) described.

It should be noted that lateral force requirement in design should be intended to resist total structural collapse due to the described PGA of 0.753g or greater. However, during the lifetime use of the structure built, it is our opinion that some structural damage may be anticipated requiring structural repairs and/or replacement. Use of flexible lifeline connections are suggested.

TABLE 3.4.1 A2: Seismic Design Coefficients

CBC Chapter 16	2022 ASCE 7-16 Standard Seismic Design Parameters	Recommended Values
1613A.5.2	Site Class	D
1613.5.1	The mapped spectral accelerations at short period	S_s
1613.5.1	The mapped spectral accelerations at 1.0-second period	S_1
1613A5.3(1)	Seismic Coefficient, S_s	1.766g
1613A5.3(2)	Seismic Coefficient, S_1	0.658g
1613A5.3(1)	Site Class D / Seismic Coefficient, F_a	1g
1613A5.3(2)	Site Class D / Seismic Coefficient, F_v	n/a
16A-37 Equation	Spectral Response Accelerations, $S_{Ms} = F_a S_s$	1.766g
16A-38 Equation	Spectral Response Accelerations, $S_{M1} = F_v S_1$	n/a
16A-39 Equation	Design Spectral Response Accelerations, $S_{Ds} = 2/3 \times S_{Ms}$	1.177g
16A-40 Equation	Design Spectral Response Accelerations, $S_{D1} = 2/3 \times S_{Ms}$	n/a

4.0 Evaluations and Recommendations

4.1 General Evaluations

Based on field explorations, laboratory testing, and subsequent engineering analyses, the following tentative conclusions and recommendations are presented for initial study:

(I) From a geotechnical viewpoint, the site is considered grossly stable for the proposed development, provided that the recommendations supplied herein are incorporated in design and construction. Foundation design should reflect considerations of the seismically induced PGA as described.

(II) Based on the dry, silty, gravelly, variable consistency nature of the upper soils existing as encountered, it is our opinion that for structural support the load bearing soils should be reworked in the form of subexcavations, followed by scarification, moisturization, and their replacement as engineered fills compacted to minimum 90%. In the event that new fill soils are required over the current grade surface such should be placed on the original grades when prepared as described.

(III) The subexcavation depths during mass grading as described in the following section should be considered as "minimum". During grading, localized deeper subexcavations may be required within areas underlain by buried debris, utilities, localized fills or soft soils and others. It will be the responsibility of the grading contractor to inform the project geotechnical engineer of the presence of such prior to further site preparations and grading.

(IV) In order to minimize potential for differential settlements, it is recommended that structural footings should be established exclusively into engineered fills of local soils compacted to the minimum as recommended in this report. Construction of footings and slabs straddling over cut and fill transition conditions shall be avoided.

(V) Structural design consideration should include probability for "moderate" peak ground acceleration from relatively active nearby earthquake faults. Implementing the seismic design parameters and procedures as outlined in the current CBC and as described earlier, however, may minimize the adverse effects for the structures proposed.

(VI) Although no groundwater was encountered, provisions should be maintained during construction to divert incidental rainfall away from the structural pads constructed.

(VII) It is our opinion that, if site preparations and grading are performed as recommended and as per the generally accepted construction practices and current CBC, the proposed development will not adversely affect the stability of the site or its adjacent.

4.1.1 Recommendations for Site Preparations and Grading for Structural Support

In absence of detailed development plans review, the planned structural pad grades are assumed at/or near the existing grade surface. For adequate structural support, it is our opinion that moderate site preparations and grading should be included in the form of subexcavations of the near grade dry, silty, gravelly, variable consistency soils and their replacement as engineered fills compacted to minimum 90%.

In general, site preparations and grading should include subexcavations of the near surface soils to about:

(i) minimum 5 feet below the current grade surface or
(ii) to the depth as required to expose the underlying moist and dense natural subgrades or
(iii) to the depth as required to maintain a 24-inch-thick compacted fill mat blanket below foundation bottoms, whichever is greater.

The site preparations and grading described should encompass, at a minimum, the proposed structural footprint areas and minimum 5 feet beyond or as suggested by the geotechnical engineer during grading. No cut and fill transition conditions should be allowed.

Within areas requiring fill soils, if any, such may be placed following sufficient subexcavations to expose the underlying dense subgrades as approved by the project geotechnical engineer. During grading, the engineered fills placed should be compacted to near Optimum Moisture and with minimum 90% compaction of soils' Maximum Dry Density as determined by ASTM D1557.

The subexcavation depths described should be considered as "preliminary". Localized additional subexcavations may be required within areas underlain by undocumented old fills, buried utilities and abandoned sewer and/or buried septic systems. It is recommended that the excavated subgrades should be verified and approved by the geotechnical engineer prior to structural fill soil placement. Supplemental recommendations may be warranted following detailed development plans review.

Mass grading required for the project is recommended to encompass, at a minimum, the entire individual structural pads and beyond.

For reference, supplemental general mass grading recommendations are included Section 5 of this report.

4.2 Structural Fill Material Requirements

The local and/or imported fills, if required, should be gravelly sand, free of organics, roots, debris, and rocks larger than 6 to 8-inch in diameter.

Although no significant variations in soil conditions are anticipated, actual soils conditions may vary during grading. It will be the contractor's responsibility to notify Soils Southwest, Inc. about such variations for revised/updated geotechnical recommendations.

Non-expansive in nature, the on-site soils free of organic, debris, and rocks larger than 8-inch in load bearing structural backfills placed should be compacted to minimum 90% of the soils' Maximum Dry Density as determined by ASTM D1557 test method. Import soils, if required, should be non-expansive, gravelly sand and meeting the following criteria:

Liquid Limit	<35
Plasticity Index	<15
Expansion Index	<20

4.2.1 Structural Fill Soils Placement

Within the areas of structural loadings, it is our opinion that the near grade soils should be subexcavated to minimum 5 feet depth. For adequate structural bearing, it is our opinion that the excavated soils may be placed in 6 to 8-inch lifts with near Optimum Moisture Conditions compacted to minimum 90%. No structural fills should be placed during unfavorable weather conditions.

4.2.2 Cut and Fill Transition Conditions Pad Preparations (if applicable)

Use of cut and fill transition conditions should be avoided to minimize potential for differential settlements to footings and concrete slabs-on-grade. Within cut and fill transition areas, if it becomes essential, it is suggested that following the necessary cut, the entire structural pad should be prepared so as to establish a uniform bearing compacted fill mat prepared in conformance to the general guidelines as described below.

Pad Preparation Guidelines for Cut and Fill Transition Condition Areas

Fill Depth Required for Finish Grade (Within low-lying areas)	Overexcavation Depth below Finish Grade (Within cut areas)
Up to 5 feet	Equal Depth
5 to 10 feet	5 feet
Greater than 10 feet	One-half the maximum thickness of fills placed on the "fill" portion (20 feet maximum)

Cut portions should be overexcavated beyond the structural perimeter lines for a horizontal distance equal to the depth of overexcavation or to a minimum distance of 5 feet, whichever is greater. Actual subexcavation depths should be determined by the geotechnical engineer during grading.

4.3 Structural Foundation Design Parameters

In the absence of detailed development plans review, it is assumed that for load bearing support conventional continuous wall foundations and isolated spread footings will be used bearing directly on the engineered graded fills placed as described earlier in this report.

It is assumed that the subject development will include concrete tilt-up or concrete framed, concrete block construction with concrete slabs-on-grade and concrete footings in the form of isolated pier foundations or continuous wall foundations. Use of load bearing concrete wall and/or isolated spread footings are assumed to be used underlain by at least 30-inch-thick engineered fill mat of local soils compacted to minimum 90% as recommended earlier.

Structural foundations, in the form of exterior load bearing wall foundations and isolated pier foundations, may be considered in design based on the following equations:

Continuous Wall Footing: $q_{allowable} = 2000 + 350d + 250b$
Isolated Square Footing: $q_{allowable} = 2400 + 350d + 100b$, where

$q_{allowable}$ = allowable soil vertical bearing capacity, in psf
d = footing depth, minimum 30-inch,
b = footing width, minimum 24-inch.

The above soil bearing capacities may be increased for each additional depth in footing and width in excess of the minimum recommended. Under static loading conditions, with a Factor of Safety, FS = 3.0, the total maximum vertical bearing capacity is recommended not to exceed 3500 psf for continuous wall footings and isolated square footings. If normal code requirements are applied, the above capacities may further be increased by an additional 1/3 for short duration of loading which includes the effect of wind and seismic forces. The load bearing footings should be reinforced with minimum 2-#5 near the near the top and 2-#5 rebar near bottom of continuous wall footings. For isolated foundations reinforcing requirements shall be determined by the project structural engineer. Actual foundation dimensions (b & d) and reinforcement requirements should be provided by the project structural engineer based on anticipated structural dead loadings, soil bearing capacity, and Peak Ground Acceleration (PGA) described.

The footing depths described should be measured vertically from the lowest adjacent outside grade and not from the finished pad grade or from finished floor surface. Footing depths and dimensions shall be verified by the geotechnical engineer prior to footing-forming, rebar, and concrete placement. It will be the contractor's responsibility to arrange such verifications by the geotechnical engineer.

Based on the laboratory determined soils' consolidation characteristics, settlements to properly designed and constructed foundations supported exclusively into engineered fills of site soils or its equivalent or better, and carrying maximum assumed structural loadings, are expected to be within "tolerable" limits.

Under static loading conditions, over a 40-foot-span, the estimated total and differential settlements should be about 1 and 1/2-inch, respectively, provided the foundations being supported by engineered fills of local soils compacted to minimum 90% as described. Most of the elastic deformations, however, are expected to occur during construction.

4.4 Concrete Slabs-on-Grade

No concrete slabs, sidewalks and flatworks should be placed bearing directly on the surface soils currently existing. The prepared subgrades to receive footings should be adequate for concrete slab-on-grade placement. The following is provided for reference only.

Building Pad Warehouse/ Truck Traffic:

1. Suggested 5-inch-thick (net) slab thickness,
2. 2500 psi concrete with water/cement ratio of 0.64 maximum,
3. #4 rebar @ 18-inch o/c using chairs or as required by the project structural engineer,
4. Within moisture sensitive areas, it is suggested to use 10-mil-thick commercially available StegoWrap, Visqueen or other approved coverings,
5. Two (2) inches of sand with SE>30 over the installed Stego Wrap System,
6. Saw cuts requirements shall be as per the structural engineer.

Driveways:

1. 6-inch-thick net slab,
2. 2500 psi concrete with water/cement ratio of 0.64 maximum,
3. Over native grade compacted to a maximum of 95%.

Flatwork:

1. 3 ½-inch-thick net concrete,
2. 2500 psi concrete with water/cement ratio of 0.64 maximum,
3. Over native grade compacted to a minimum 90%,
4. Tooled joints per the structural engineer.

It is recommended that, prior to concrete pours, utility trenches underlying concrete slabs and driveways should be thoroughly backfilled with sandy gravelly soils, mechanically compacted to the minimum compaction requirements as described.

Within moisture sensitive areas, concrete slabs should be underlain by 2-inch of compacted clean sands, followed by 10-mil-thick vapor barrier, such as commercially available StegoWrap, Visqueen or other approved coverings, overlying an additional 2-inch-thick layer of sands. Sands used should have a Sand Equivalent, SE of 30 or greater.

Subgrades to receive concrete foundations and slab-on-grade should be "'dampened" as would be expected in any such concrete placement. Use of low-slump concrete is recommended. In addition, it is recommended that utility trenches underlying concrete slabs and driveways should be thoroughly backfilled with gravelly sandy soils mechanically compacted to minimum 90%. Concrete construction joint requirements should be determined by the project structural engineer.

No concrete should be placed during extreme weather conditions, such as during high outside temperature and/or during high Santa Ana wind conditions. Use of excess water on finished grade is not recommended to prevent post-placement concrete "warping".

4.4.1 Concrete Curing and Crack Control

The recommendations presented in this report are intended to reduce potentials for cracking of concrete slabs-on-grade due to concrete curing or settlement. However, even when the following recommendations have been implemented, foundations, stucco walls and concrete slabs-on-grade may display some minor cracking due to minor soil movement and/or concrete shrinkage.

The occurrence of concrete cracking may also be reduced and/or controlled by limiting the slump of the concrete used, proper concrete placement, and curing along with using crack control joints at reasonable intervals where re-entrant slab corners occur. For standard crack control, maximum expansion/construction joint spacing is recommended not to exceed 24 to 30 x the concrete thickness. Shorter distance between joint spacing would provide greater crack control. Joints at curves and angle points are suggested as determined by the project structural engineer.

To minimize potentials for "warping", subgrades to receive concrete shall be free of excess water. Concrete placements during adverse weather conditions should not be allowed.

4.5 Resistance to Lateral Loads

Resistance to foundation lateral displacement can be achieved by friction acting at the base of foundation and by passive earth pressures. A coefficient friction of 0.40 may be assumed with normal dead load forces for footing established on engineered compacted fills of local soils.

An allowable passive lateral earth resistance of 300 psf per foot of depth may be assumed for the sides of foundations poured against compacted fills. The maximum lateral passive earth pressure is recommended not to exceed 3000 lbs.

For design, active lateral pressures from local soils when used as backfills may be estimated from the following equivalent fluid density:

CONDITIONS	EQUIVALENT FLUID DENITY, pcf	
	Level Backfill	2:1 Backfill Sloping Upwards
Active	40	55
At Rest	55	70
Seismic	75% of active earth pressures	75% of active earth pressures

4.6 Shrinkage and Subsidence

It is our opinion that during grading the upper soils may be subjected to a volume change. Assuming a 90% relative compaction for structural fills and assuming an overexcavation and recompaction depth as described earlier, such volume change due to shrinkage may be on the order of 7% to 10%. Further volume change may be expected due to supplemental shrinkage during preparation of subgrade soils. For estimation purpose, such may be approximated to about 2-inch when conventional construction equipment is used.

4.7 Construction Considerations

4.7.1 Unsupported Excavation

Gravelly sandy site soils encountered are considered highly susceptible to caving. Temporary excavations up to 4 feet in depth may be made without rigorous lateral support. Excavated surface should be "'wetted" during construction to minimize potential surface soil raveling. No surcharge loading should be allowed within an imaginary 1:1 line drawn upward from the toe of the temporary excavations.

4.7.2 Supported Excavations

If vertical excavations exceeding 4 feet in depth become warranted, such should be achieved using shoring to support sidewalls.

4.8 Soil Caving

Considering the gravelly sandy site soils encountered as described, it is our opinion that some caving may be expected during deep excavations. Temporary excavations in excess of 5 feet should be made at a slope ratio of 2 to 1 (h:v) or flatter, or as per the construction guidelines as provided by Cal-Osha.

4.9 Site Preparations for Driveways/Parking/Paving

Assuming concrete paving for use by conventional traffic, it is suggested that prior to concrete placement, the subgrades to receive paving should be subexcavated to minimum 18 inches, followed by the local excavated soils replacement in 6 to 8-inch-thick lifts, compacted to minimum 95%. Use of vibratory sheepsfoot roller is suggested during grading.

4.10 Pavement Thickness Design

Alternative I - Rigid Concrete Paving

Rigid paving, if selected, should be at least 6-inch-thick concrete placed directly over the local sandy gravelly soils compacted to minimum 95%. Alternatively, 5-inch thick concrete can be considered over 4-inch class II base material compacted to 95%. Actual paving thickness and reinforcement requirements should be supplied by the project structural engineer using soils' Subgrade Reaction Modulus, kcf of 350.

Rigid concrete driveways should have thickened edges to prevent potential for lateral sliding under auto and truck traffic loading.

Alternative II - Asphalt Paving

Flexural asphalt paving, if selected, based on the estimated Traffic Indices (TIs) as described and a laboratory determined soils' R-value of 75 and laboratory determined soils' Sand Equivalent, SE of 46.76, the following flexible (a.c.) pavement sections are provided for initial use:

Service Vehicle	Traffic Index, TIs	Pavement Type	Paving Thickness (inch)
Auto/ Truck Traffic	7	a.c. over Class II base or CMB	3.0 over 3.0 5.0 over native
	10	"	5.0 over 3.0

Within paving areas, subgrade soils should be subexcavated to minimum 18 inches, moisture conditioned to near Optimum Moisture Content, followed by the excavated soils replacement as engineered fills compacted to at least 95% of the soils' maximum Dry Density as determined by the method ASTM D1557. Class II base or CMB used to receive asphalt concretes should be placed directly over the prepared subgrades and compacted to minimum 95%. Use of thicker/deepened paving edges are recommended to minimize potential for edge movement and paving distress.

The pavement evaluations are based on estimated Traffic Index (TI) as shown and on the soils' R-value as described. It is recommended that following mass grading completion, representative site soils should be laboratory tested to determine soils' R-value and to provide updated paving thickness.

4.11 Retaining Wall (if planned)

It is unknown if any retaining structure will be associated with development proposed. It is our opinion that retaining foundations should be designed based on a soils vertical bearing capacity of 1800 psf, along with the lateral active pressures as described below:

Slope of Retained Material (h:v)	Equivalent Fluid Density, pcf	
	Clean Sand	Local Soil
level	30	35
2:1	42	55

During a local Magnitude 6.7 earthquake along the Cucamonga fault zone, additional lateral pressures will occur along the back of the retaining walls. The seismic-induced lateral soil pressure may be computed using a triangular pressure distribution with the maximum value at the top of the wall> The maximum lateral pressure of (20 pcf) H where H is the height of the retained soils above the wall footing should be used in the final design of retaining wall.

Sliding resistance value and passive fluid pressure values may be increased by 1/3 during short-erm wind and seismic loading conditions.

Any applicable short-term construction surcharges and seismic forces should be added to the above lateral pressure values. All walls shall be waterproofed and protected from hydrostatic pressure by a reliable permanent subdrain system.

The design parameters do not include any hydrostatic pressure build-up. Consequently, installation of "'French-drain" behind retaining walls is recommended to minimize water pressure build-up behind retaining walls. Use of impervious material is preferred within upper the 18 inches of the backfills placed.

Backfills behind retaining wall should be compacted to a minimum 90% of the soils' Maximum Dry Density as determined by the ASTM D15571 test method. Flooding and/or jetting behind wall should not be permitted.

Walls adjacent to traffic areas should be designed to resist a uniform lateral pressure of 100 psf, which is a result of an assumed 300 psf surcharge behind the walls due to normal traffic. If the traffic is kept back 10 feet from the wall, the traffic surcharge may be neglected.

4.12 Utility Trenches Backfill

Utility trenches backfills at depth in excess of 2 feet should be placed in thin lifts and compacted to the minimum requirements described. As an alternative, clean granular sand may be used having Sand Equivalent, SE of minimum 30. Jetting is not recommended in lieu of mechanical compaction. Trench excavations should conform to the requirements and safety as specified by Cal-Osha.

4.13 Seasonal Limitations

No fill shall be placed, spread or rolled during unfavorable weather conditions. Where the work is interrupted by heavy rains, fill operations shall not be resumed until moisture conditions are considered favorable by the geotechnical engineer.

4.14 Planters

To minimize potential differential settlement to foundations, planters requiring heavy irrigation should be restricted from using adjacent to footings. In the event that such becomes unavoidable, planter boxes with sealed bottoms should be considered.

4.15 Landscape Maintenance

Only the amount of irrigation necessary to sustain plant life should be provided. Pad drainage should be directed towards streets and to other approved areas away from foundations. Slope areas should be planted with draught resistant vegetation. Over watering landscape areas could adversely affect the proposed site development during its lifetime use.

4.16 Observations and Testing During Site Preparations and Grading

Recommendations provided assume that structural footings and slabs-on-grade be established exclusively into compacted fills. Excavated footings should be inspected, verified, and certified by the geotechnical engineer prior to steel and concrete placement to ensure their sufficient embedment and proper bearing as recommended. Structural backfills discussed should be placed under direct observation and testing by Soils Southwest, Inc. Excess soils generated from footing excavations should be removed from pad areas.

In general, geotechnical inspections should include, at a minimum, the following:

- Subexcavation depth during grading,
- Fill compaction testing,
- Retaining wall backfill compaction (if planned),
- Excavated foundation depth,
- Paving subgrade verification, and
- Utility trenches backfill compaction.

4.17 Plan Review

No precise grading or detailed development plans are prepared and none such are available for review. Prior to the actual mass grading, grading and foundation plans should be available to ensure applicability of the assumptions made in preparing this report. If during construction, conditions are observed different from those as presented, revised and/or supplemental recommendations will be required.

4.18 Pre-Construction Meeting

It is recommended that no clearing of the site or any grading operations be performed without the presence of a representative of this office. An on-site pre-grading meeting should be arranged between the geotechnical engineer and the grading contractor prior to the start of construction. Two days' advance notice for such meeting is required.

5.0 Earth Work/General Grading Recommendations

It is our opinion that the soils encountered primarily consist upper 3 feet of variegating layers of gravels and gravel silty fine to medium coarse sand mixtures with concentrations of rocks, cobbles, and occasional small boulders to the refusal depth of 3 feet explored. Descriptions of the soils encountered are provided in the attached Log of Borings.

Prior to grading commencement, it is suggested that all debris and loose stockpiles should be cleared and disposed off-site to the satisfaction of the geotechnical engineer. In general, site preparations and grading for the project should include, at a minimum, the following:

Structural Backfill

Local soils free of organics, debris, and rocks smaller than 6-inch in overall diameter should be considered suitable for reuse as structural backfill. Loose soils, formwork, and debris should be removed prior to backfilling retaining walls. Local soils backfill should be placed and compacted in accordance with the recommendations provided below. Where space limitations do not allow conventional backfilling operations, special backfill materials, and procedures may be required. Pea gravel or other select backfill can be used within limited space areas. Additional recommendations on such will be provided during construction.

Percentage Compaction During Mass Grading

With the presence of fine to coarse gravelly sandy soils with trace silts, isolated cobbles and rocks existing as described and assuming moderately high dead loads and seismic peak ground acceleration described, it is our opinion that structural fills placed should be compacted to the minimum 90% compaction requirements described. During grading, use of vibratory sheepsfoot roller is recommended.

Site Drainage

Adequate positive drainage should be maintained away from the structural pad in order to prevent water from ponding and to reduce potential percolation into backfill. A desirable slope for surface drainage is 2% in landscape areas and 1% in paved areas. Planters and landscaped areas adjacent to building perimeter should be adequately designed to minimize water filtration into subsoils. Considerations should be given to the use of closed planter bottoms, concrete slabs, and perimeter subdrains where applicable.

Utility Trenches

Buried utility conduits should be bedded and backfilled around the conduit in accordance with the project specifications. Buried utilities in excess of 2 feet should be backfilled with local gravelly sandy soils and compacted to at least 90%. Remaining near surface backfills should be compacted to 95%.

General Grading Recommendations:

Recommended general specifications for surface preparation to receive compacted engineered fills for structural support and utility trench backfill and others are presented below:

1. Areas to be graded, backfilled or paved, shall be grubbed, stripped, and cleaned of all buried and undetected debris, structures, concrete, vegetation and other deleterious materials prior to grading.

2. During grading, the estimated subexcavation depths within building pad areas and 5 feet beyond should be minimum 5 feet below the current grade surface.

3. Where compacted fill is used to provide vertical support for foundations, all loose, soft, and other incompetent soils should be removed to full depth as approved by the geotechnical engineer.

4. Compaction for structural fills shall be determined relative to the Maximum Dry Density as determined by ASTM D1557 compaction methods. All in-situ field density of compacted fill shall be determined by the ASTM D1556 standard methods or by other approved procedures.

5. All new imported soils, if required, shall be clean, granular, and non-expansive material requiring prior approval by the geotechnical engineer.

6. During grading, fill soils shall be placed as thin layers, thickness of which following compaction shall not exceed 6 inches.

7. In accordance with the CBC: rock sizes greater than 12 inches (305 mm) and up to 24 inches (610 mm) in maximum dimension shall be three feet (914 mm) or more below grade, measured vertically. Rock sizes greater than 24 inches (610 mm) in maximum dimension shall be 10 feet (3048 mm) or more below grade, measured vertically.

8. No jetting and/or water tampering be considered for backfill compaction for utility trenches without prior approval of the geotechnical engineer. For such backfill, hand tampering with fill layers of 8 to 12 inches in thickness or as approved by the geotechnical engineer is recommended.

9. Any and all utility trenches at depth as well as cesspool and abandoned septic tank within building pad area and beyond, should either be completely excavated and removed from the site or should be backfilled with gravel, slurry or by other material, as approved by the geotechnical engineer.

10. Any and all import soils if required during grading should be equivalent to the site soils or better. The geotechnical engineer prior to their use should approve such.

11. Any and all grading required for pavement, sidewalks or other facilities to be used by general public, should be constructed under direct observation of the geotechnical engineer or as required by the local public agencies.

12. A site meeting should be held between the grading contractor and the geotechnical engineer prior to actual site preparations and grading. Two days advance notice will be required for such meeting.

6.0 WQMP-BMP Infiltration Rates Using Porchet Method for Stormwater Disposal Design

In general, four (4) infiltration tests were planned at the depth and locations as suggested by the project design engineer. Considering the excessively gravely sands and concentrations of rocks, cobbles, and occasional small boulders, infiltration testing was limited to the depths of 3 and 5 feet below existing surface grade (BSG) at the southwest where 8-foot testing was planned. Planned testing (P-3 and P-4) at depths 3 to 4 feet within the area of the planned basin/swale could not be performed due to resistance at 1 and 1.5 feet due to concentrations of rocks, cobbles, and small boulders. The tests were performed using the standardized "falling-head" test converted using the Porchet method. Test locations and test data are shown in the attached Appendix D.

Method of infiltration rate as per the guidelines in accordance with Table 1, Infiltration Basin Option 2 of Appendix A of the Riverside County-Low Impact Development (LID) BMP Design Handbook as well as per the Appendices Section VII.3.8.2, Appendix VII: Infiltration Rate Evaluation Protocol and Factor of Safety Recommendations of the San Bernardino County Technical Guidance Document for Water Quality Management Plans Handbook.

Approximate test locations are shown on the attached Plate 1. The test results should be considered tentative given the potential for changes to site finish grades or changes in soil conditions as exposed during site preparations and grading.

The soils encountered within the proposed chamber consist, in general, of dry gravels and fine to medium coarse poorly graded silty sands overlying variegating layers of gravels and silty fine to medium coarse sands with rocks and cobbles to the depth explored of 3 and 5 feet as described (test borings P-1 to P-2). Descriptions of the soils encountered are provided in the attached Log of Borings.

Based on the field infiltration testing completed, it is our opinion that for the infiltration system design proposed at about 3 and 5 feet below grade, the observed soils infiltration rates are 19.79 inches/hour and 15.62 inches/hour for test locations P-1 and P-2, respectively.

For design, it is suggested that use of an appropriate factor of safety as determined by the design engineer should be considered to the observed rate to account for long-term saturation, inconsistencies in subsoil conditions, potential for silting, and lack of maintenance. The observed soils' percolation rates are provided in Section 6.3 of this report.

6.1 METHODOLOGY AND TEST PROCEDURES

EQUIPMENT SET-UP (POST EXCAVATION) PROCEDURES:

Following test boring completion, each of the test holes were fitted with perforated PVC pipes backfilled with 2-inch-thick crushed rock at the bottom to minimize potentials for scouring and caving. For testing, each test hole was initially filled using water supplied by water jugs.

Prior to actual testing, to determine test intervals, as per the Section 2.3 for deep percolation testing of the referenced handbook guideline, two consecutive readings were performed to determine if 6 or more inches of water seeped in 25 minutes. Since 6 inches or more of water seeped away in less than 25 minutes for all test locations, P-1 and P-2 , subsequent percolation testing was performed at 10-minute time intervals for at least minimum one hour or until the rates were uniform. Testing included water placement at about and 3 feet below existing grade surface (inlet depth of 24 inches above infiltration system bottom).

The final 10-minute recorded percolation test rates were converted into an Infiltration Rate (I_t) for inches per hour using the "Porchet Method" equation as described in the Reference 2, Riverside County Low Impact Development BMP Design Handbook, as well as per the Appendices Section VII.3.8.2, Appendix

VII: Infiltration Rate Evaluation Protocol and Factor of Safety Recommendations on the San Bernardino County Technical Guidance Document for Water Quality Management Plans Handbook.

6.2 INFILTRATION TEST RESULTS

Based on the soils infiltration testing completed at the test locations and at the test depth as described, the observed soils' percolation rates are 19.79 inches/hour and 15.62 inches/hour for test locations P-1 and P-2, respectively.

Calculations to convert the percolation test rate to infiltration test rates in accordance with Section 2.3 of the County Handbook are presented in Table I and II below. For design, it is suggested that an appropriate Factor of Safety as selected by the design engineer should be considered to the observed field percolation rate described.

6.2.1 SUMMARY & CONVERSION CALCULATIONS

TABLE I

For WQMP-BMP design, based on the soils infiltration testing completed and, on the calculations as described, the following infiltration rates may be considered. Actual field test data are attached.

Observed Infiltration Rate for Design

Test Location (8-9-24)	Test Depth Below Grade, feet	Porchet Method Observed Rate, inch/hour
P-1	3	19.79
P-2	5	15.62
P-3	n/a	n/a
P-4	n/a	n/a

Note: n/a: due to shallow boring resistance to near surface concentrations of rocks, cobbles, and small boulders, infiltration tests could not be performed at the required depths.

TABLE II
Conversion Table (Porchet Method)

Test No.	Depth Test Hole, inches	Time Interval, minutes	Initial Depth, inches	Final Depth, inches	Initial Water Height, inches	Final Water Height, inches	Change in Height/ Time	Average Head Height/Time
	Dt	ΔT	D_O	D_f	$H_o=D_t-D_o$	$H_f=D_t-D_f$	$\Delta H= H_f-H_O$	$H_{avg} = (H_o+H_f)/2$
P-1	36	10	12	35.5	24.0	0.5	23.50	12.25
P-2	60	10	36	56.5	24.0	3.5	20.50	13.75

	Infiltration Rate (It)=ΔH60r/Δt(r+2Havg)		
	A	B	C
Test No.	ΔH60r	Δt(r+2Havg)	A/B=in/hr
P-1	5640	285	19.79
P-2	4920	315	15.62

Use of a safety factor should be considered to account for long-term saturation, inconsistencies in subsoil conditions along with the potential for silting of percolating soils.

The infiltration rate described is based on the in-situ testing completed at the locations as suggested by the project civil engineer. In the event that the final chamber location and depth vary considerably from those described herein, supplemental soils infiltration testing may be warranted.

It should be noted that over prolonged use and lack of maintenance the detention/infiltration basins or deep chambers constructed based on the suggested design rate may experience much lower infiltration rate due to the accumulation of silts, fines, soils, and others. Regular maintenance of the chambers in the form of removal of debris, oil, and fines are strongly recommended. A maintenance record of such is suggested for future use.

Suggested Requirements for Standard Stormwater BMP installation (where applicable)
The invert of stormwater infiltration should be set at least 10 feet above the groundwater elevation and should not be placed on steep slopes to create conditions for slopes instability.

When adequately installed, it is our opinion that the Stormwater infiltration systems installed should not increase the potential for static or seismic settlement of structures.

Stormwater infiltration installed should not place an increased surcharge on structures or foundations on or its adjacent. The pore water pressure should not increase the soils retained by retaining structures.

The invert of stormwater infiltration should be set back at least 15 feet and outside a 1:1 plan drawn up from the bottom of adjacent foundations.

Stormwater infiltration should not be located near utility lines where the introduction of stormwater could cause damage to utilities or settlement of trench backfill.

Stormwater infiltration systems should not be allowed within 100 feet of any potable groundwater production well.

Once installed, regular maintenance of the detention systems is recommended.

7.0 Closure

The conclusions and recommendations presented are based upon the findings and observations as made during subsurface test excavations and subsequent laboratory testing and engineering evaluations as currently used in the Geotechnical industry. The recommendations supplied should be considered "preliminary" since they are based on soil samples only. If during construction, the subsoil conditions appear different from those as disclosed during field investigation this office should be notified to consider any possible need for modification by the geotechnical recommendations as provided in this report.

Recommendations provided are based on the assumptions that structural footings will be established exclusively into compacted fill. No footings and/or slabs should be allowed straddling over cut and fill transition interface.

Site grading observations and testing must be performed by a representative of this office. Further, it is recommended that excavated footings should be verified and approved by geotechnical engineer prior to steel and concrete placement to ensure that foundations are founded into satisfactory soils and excavations are free of loose and disturbed materials.

A pre-grading meeting between grading contractor and geotechnical engineer is recommended prior to construction preferably at the site, to discuss the grading procedures to be implemented and other requirements described in this report to be fulfilled.

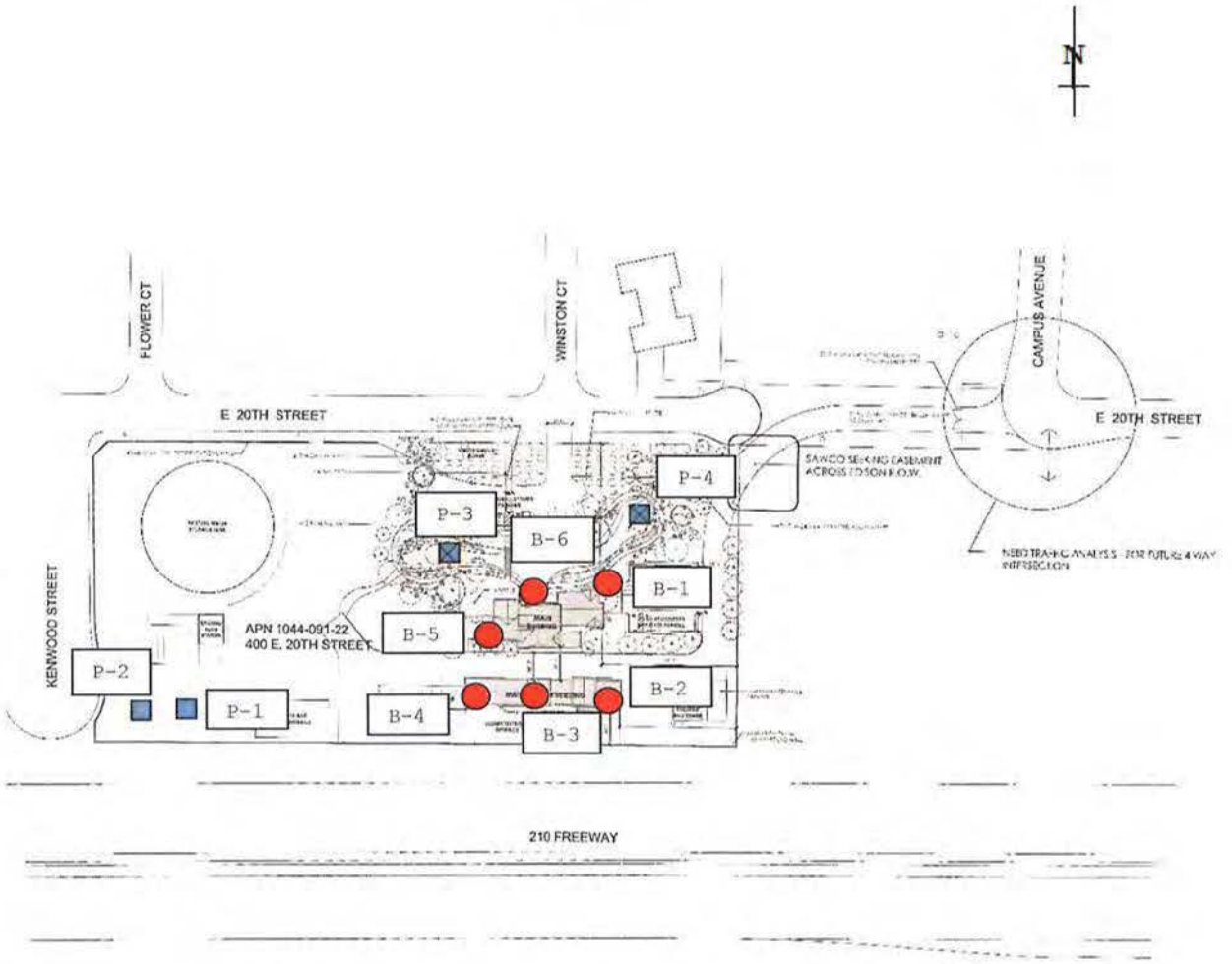
This report has been prepared exclusively for the use of the addressee for the project referenced in the context. It shall not be transferred or be used by other parties without written consent by Soils Southwest, Inc.

Should the project be delayed beyond one year after the date of this report, the recommendations presented shall be reviewed to consider any possible change in site conditions.

The recommendations presented are on the assumption that the necessary geotechnical observations and testing during construction will be performed by a representative of this office. The field observations are considered a continuation of the geotechnical investigation performed.

If another firm is retained for geotechnical observations and testing, our professional liability and responsibility shall be limited to the extent that Soils Southwest, Inc. would not be the geotechnical engineer of record. Use of the geotechnical recommendations by others will relieve Soils Southwest, Inc. of any liability that may arise during the lifetime use of the structure constructed.

PLOT PLAN AND TEST LOCATIONS
400 E. 20th Street, Upland
APN: 1044-091-22
Not to Scale



Legend:

- B-1 Approximate Location of Test Borings for Geotechnical Evaluations
- P-1 Approximate Location of Test Pit for BMP Soils' Infiltration
- P-3 Approximate location of Test Pit for BMP Soils Infiltration that could not be performed as planned due to surface concentrations of rocks, cobbles, and small boulders.

List of Appendices

Appendix A - Log of Borings

Appendix B - Laboratory Test Results

Table I: In-Situ Moisture-Density (ASTM D2216 and D2937)

Table II: Max. Density/Optimum Moisture Content (ASTM D1557)

Table III: Direct Shear (ASTM D3080)

Table IV: Consolidation (ASTM D2435)

Table V: Sand Equivalent, SE (ASTM D2419)

Table VI: Sieve Analysis (ASTM D422)

Table VII: Soils' Chemical Analyses Test Results

Table VIII: Soils' Density Correlation to SPT Blow Counts

APPENDIX C – Supplemental Seismic Design Parameters &
FEMA National Flood Hazard Layer Map

APPENDIX D - Field Infiltration Test Data Porchet Method Calculation Summary

LOG OF BORINGS

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING B-1

Project: San Antonio Water District Headquarters		**Job No.:** 24036-F/BMP
Logged By: John F.	**Boring Diam.:** 8" HSA	**Date:** August 9,2024

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					GP			disturbed surface soils, gravels, scattered debris
					GM-SM			GRAVELS consisting of rocks and cobbles - (Max Dry Density = 133 pcf @ 8.0 %
							5	GRAVEL/SAND mixture-tannish light brown, silty, fine to medium coarse, pebbles, rock fragments, rocks, cobbles, dry
							10	- Abandoned at +/- 3.0 ft. due to resistance (concentrations of rocks and cobbles) - no bedrock - no groundwater
							15	
							20	
							25	
							30	

Groundwater: n/a **Approx. Depth of Bedrock:** n/a **Datum:** n/a **Elevation:** n/a	**Site Location** Planned Headquarter Facility 400 East 20th Street Upland, California	**Plate #**

Bulk/Grab sample

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING B-2

Project: San Antonio Water District Headquarters		**Job No.:** 24036-F/BMP
Logged By: John F.	**Boring Diam.:** 8" HSA	**Date:** August 9,2024

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					GP			gravels GRAVEL- rocks cobbles, small boulders, with very little yellow tan silty dry sand - Abandoned test boring @ 1.5 feet due to resistance (concentrations of rocks and cobbles - no bedrock - no groundwater
							5	
							10	
							15	
							20	
							25	
							30	

Groundwater: n/a **Approx. Depth of Bedrock:** n/a **Datum:** n/a **Elevation:** n/a	**Site Location** Planned Headquarter Facility 400 East 20th Street Upland, California	**Plate #**

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING B-3

Project: San Antonio Water District Headquarters		**Job No.:** 24036-F/BMP
Logged By: John F.	**Boring Diam.:** 8" HSA	**Date:** August 9,2024

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					GM-SM			gravels, scattered weeds and debris GRAVEL/SAND mixture-with gravely and slightly silty, fine to medium coarse, rock fragments, rocks, and cobbles, dry - Abandoned Test boring @ 2.0 ft. due to resistance (concentrations of rocks and cobbles) - no bedrock - no groundwater

Groundwater: n/a **Approx. Depth of Bedrock:** n/a **Datum:** n/a **Elevation:** n/a	**Site Location** Planned Headquarter Facility 400 East 20th Street Upland, California	**Plate #**

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING B-4

Project: San Antonio Water District Headquarters		**Job No.:** 24036-F/BMP
Logged By: John F.	**Boring Diam.:** 8" HSA	**Date:** August 9,2024

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					GM-SM			disturbed surface gravels and soils
								GRAVEL/SAND mixture-light tan silty, fine to medium coarse, rock fragments, rocks,cobbles occasional small boulders, dry
							5	- Abandoned test boring @ 0.5 ft. due to resistance (concentrations of rocks, cobbles, small boulders) - no bedrock - no groundwater
							10	
							15	
							20	
							25	
							30	

Groundwater: n/a
Approx. Depth of Bedrock: n/a
Datum: n/a
Elevation: n/a

Site Location

Planned Headquarter Facility
400 East 20th Street
Upland, California

Plate #

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING B-5

Project: San Antonio Water District Headquarters		**Job No.:** 24036-F/BMP
Logged By: John F.	**Boring Diam.:** 8" HSA	**Date:** August 9,2024

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					GM-SM			disturbed surface gravels and soils with rocks and cobbles
								GRAVEL/SAND mixture-tan to light brown, slightly silty, fine to medium coarse, rock fragments, rocks, and cobbles, dry
							5	- Abandoned test boring @ +/- 1.5 feet due to resistance(concentrations of rocks and cobbles) - no bedrock - no groundwater
							10	
							15	
							20	
							25	
							30	

Groundwater: n/a **Approx. Depth of Bedrock:** n/a **Datum:** n/a **Elevation:** n/a	**Site Location** Planned Headquarter Facility 400 East 20th Street Upland, California	**Plate #**

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING B-6

Project: San Antonio Water District Headquarters		**Job No.:** 24036-F/BMP
Logged By: John F.	**Boring Diam.:** 8" HSA	**Date:** August 9,2024

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
								gravels, rocks, cobbles GRAVEL/SAND mixture-light tan to brown, slightly silty, fine to medium coarse,rocks cobbles, dry
							5	- Abandoned test boring @ 2.0 ft. due to resistance (concentrations of rocks and cobbles) - no bedrock - no groundwater
							10	
							15	
							20	
							25	
							30	

Groundwater: n/a **Approx. Depth of Bedrock:** n/a **Datum:** n/a **Elevation:** n/a	**Site Location** Planned Headquarter Facility 400 East 20th Street Upland, California	**Plate #**

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING P-1

Project: San Antonio Water District Headquarters		**Job No.:** 24036-F/BMP
Logged By: John F.	**Boring Diam.:** 8" HSA	**Date:** August 9,2024

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					GM-SM			- disturbed surface gravels and soils
								GRAVELS/SAND mixture -light yellow tan,silty fine, dry with rocks and cobbles
					SM			SAND - gray-brown, silty, fine to medium coarse, pebbles, rock fragments, rocks, cobbles, dry
					GP		5	GRAVELS with little to no sand,rocks,cobbles
								- Abandoned infiltration test boring @3.0 ft due to resistance (concentrations of rock and cobbles) - no bedrock
								- no groundwater
							10	
							15	
							20	
							25	
							30	

Groundwater: n/a **Approx. Depth of Bedrock:** n/a **Datum:** n/a **Elevation:** n/a	**Site Location** Planned Headquarter Facility 400 East 20th Street Upland, California	**Plate #**

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING P-2

Project: San Antonio Water District Headquarters		**Job No.:** 24036-F/BMP
Logged By: John F.	**Boring Diam.:** 8" HSA	**Date:** August 9,2024

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					SM			disturbed gravels and soils
								SAND - yellowish tannish brown, silty, fine to medium coarse, pebbles, rock fragments, rocks, dry
								- with rocks and cobbles
					GP		5	GRAVELS
								- Abandoned infiltration test boring @5.0ft. due to resistance (concentrations of rocks and cobbles)
								- no bedrock
								- no groundwater
							10	
							15	
							20	
							25	
							30	

Groundwater: n/a
Approx. Depth of Bedrock: n/a
Datum: n/a
Elevation: n/a

Site Location

Planned Headquarter Facility
400 East 20th Street
Upland, California

Plate #

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING P-3

Project: San Antonio Water District Headquarters		**Job No.:** 24036-F/BMP
Logged By: John F.	**Boring Diam.:** 8" HSA	**Date:** August 9,2024

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					GM-SM			gravels, rocks, and cobbles
								GRAVEL/SAND mixture- light yellow gray tan, silty, fine, rock fragments, rocks, cobbles scattered small boulders, dry
								SAND (fill) - color change to light brown, silty, fine to medium coarse, pebbles, rock fragments, rocks, cobbles, scattered debris, dry
							5	- Abandoned infiltration test boring @ 1.5ft due to resistance (concentrations of rock and cobbles)
								- no bedrock
								- no groundwater
							10	
							15	
							20	
							25	
							30	

Groundwater: n/a **Approx. Depth of Bedrock:** n/a **Datum:** n/a **Elevation:** n/a	**Site Location** Planned Headquarter Facility 400 East 20th Street Upland, California	**Plate #**

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING P-4

Project: San Antonio Water District Headquarters		**Job No.:** 24036-F/BMP
Logged By: John F.	**Boring Diam.:** 8" HSA	**Date:** August 9,2024

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					GP			disturbed surface gravels and soils
								GRAVEL with little sand, rocks, cobbles,and occasional small boulders, dry
								- Abandoned infiltration test boring @ 1.0ft due to resistance(concentration of rocks cobbles)
							5	- no bedrock
								- no groundwater
							10	
							15	
							20	
							25	
							30	

Groundwater: n/a **Approx. Depth of Bedrock:** n/a **Datum:** n/a **Elevation:** n/a	**Site Location** Planned Headquarter Facility 400 East 20th Street Upland, California	**Plate #**

KEY TO SYMBOLS

Symbol	Description
Strata symbols	
	Poorly graded gravel
	Silty sand and gravel
	Silty sand

Notes:

1. Exploratory borings were drilled on August 9,2024 using a 4-inch diameter continuous flight power auger.

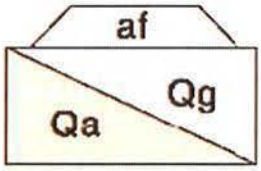
2. No free water was encountered at the time of drilling or when re-checked the following day.

3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.

4. These logs are subject to the limitations, conclusions, and recommendations in this report.

5. Results of tests conducted on samples recovered are reported on the logs.

LEGEND

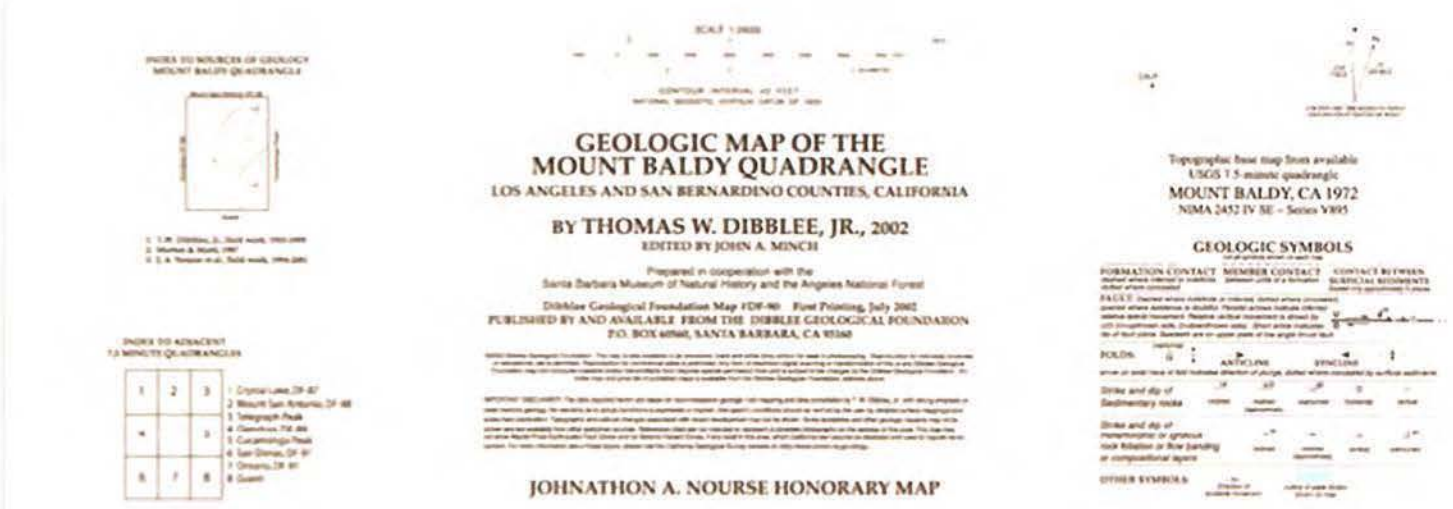


SURFICIAL SEDIMENTS

af *artificial fill*

Qg *alluvial gravel and sand of stream channels*

Qa *alluvial gravel and sand of valley areas*



GEOLOGIC MAP OF THE
MOUNT BALDY QUADRANGLE
LOS ANGELES AND SAN BERNARDINO COUNTIES, CALIFORNIA

BY THOMAS W. DIBBLEE, JR., 2002
EDITED BY JOHN A. MINCH

Prepared in cooperation with the
Santa Barbara Museum of Natural History and the Angeles National Forest

Dibblee Geological Foundation Map #DF-90 First Printing, July 2002
PUBLISHED BY AND AVAILABLE FROM THE DIBBLEE GEOLOGICAL FOUNDATION
P.O. BOX 60760, SANTA BARBARA, CA 93160

JOHNATHON A. NOURSE HONORARY MAP

Topographic base map from available
USGS 7.5-minute quadrangle
MOUNT BALDY, CA 1972
NIMA 2452 IV SE – Series V895

GEOLOGIC SYMBOLS

SOURCE: USGS/AASG National Geological Map/Map View (beta) NGMDB

USDA United States Department of Agriculture
Natural Resources Conservation Service

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Area of Interest (AOI) | Soil Map | Soil Data Explorer | Download Soils Data | Shopping Cart (Free)

Search

Map Unit Legend

San Bernardino County Southwestern Part, California (CA677)

San Bernardino County Southwestern Part, California (CA677)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
HaC	Hanford coarse sandy loam, 2 to 9 percent slopes	11.8	17.2%
RmC	Ramona sandy loam, 2 to 9 percent slopes, MLRA 19	5.7	8.3%
SoC	Soboba gravelly loamy sand, 0 to 9 percent slopes	9.9	14.5%
SpC	Soboba stony loamy sand, 2 to 9 percent slopes	41.2	60.0%
Totals for Area of Interest		**68.7**	**100.0%**

Legend

Soil Map

Scale (not to scale)

San Bernardino County Southwestern Part, California

SpC—Soboba stony loamy sand, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: hckv
Elevation: 960 to 3,690 feet
Mean annual precipitation: 12 to 39 inches
Mean annual air temperature: 60 to 65 degrees F
Frost-free period: 260 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Soboba and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Soboba

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

Ap - 0 to 10 inches: stony loamy sand
C1 - 10 to 24 inches: very stony loamy sand
C2 - 24 to 60 inches: very stony sand

Properties and qualities

Slope: 2 to 9 percent
Surface area covered with cobbles, stones or boulders: 0.1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 19.99 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: R019XG912CA - Sandy Fan

Hydric soil rating: No

Minor Components

Hanford

Percent of map unit: 5 percent
Landform: Alluvial fans
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Ramona

Percent of map unit: 5 percent
Landform: Fan remnants
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Tujunga, gravelly loamy sand

Percent of map unit: 5 percent
Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Data Source Information

Soil Survey Area: San Bernardino County Southwestern Part, California
Survey Area Data: Version 15, Aug 30, 2023

San Bernardino County Southwestern Part, California

SoC—Soboba gravelly loamy sand, 0 to 9 percent slopes

Map Unit Setting

National map unit symbol: hckt
Elevation: 30 to 4,200 feet
Mean annual precipitation: 10 to 20 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 175 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition

Soboba and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Soboba

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 12 inches: gravelly loamy sand
H2 - 12 to 36 inches: very gravelly loamy sand
H3 - 36 to 60 inches: very stony sand

Properties and qualities

Slope: 0 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: R019XG912CA - Sandy Fan
Hydric soil rating: No

Minor Components

Unnamed
Percent of map unit: 5 percent
Hydric soil rating: No

Delhi, fine sand
Percent of map unit: 5 percent
Hydric soil rating: No

Tujunga, gravelly loam
Percent of map unit: 3 percent
Hydric soil rating: No

Unnamed
Percent of map unit: 2 percent
Landform: Drainageways
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: San Bernardino County Southwestern Part, California
Survey Area Data: Version 15, Aug 30, 2023

San Bernardino County Southwestern Part, California

HaC—Hanford coarse sandy loam, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: 2y8tl
Elevation: 890 to 2,860 feet
Mean annual precipitation: 11 to 22 inches
Mean annual air temperature: 64 to 65 degrees F
Frost-free period: 320 to 365 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Hanford and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hanford

Setting

Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

A - 0 to 12 inches: sandy loam
C - 12 to 60 inches: fine sandy loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: R019XG911CA - Loamy Fan
Hydric soil rating: No

Minor Components

Greenfield, sandy loam

Percent of map unit: 10 percent
Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Tujunga, loamy sand

Percent of map unit: 5 percent
Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Data Source Information

Soil Survey Area: San Bernardino County Southwestern Part, California
Survey Area Data: Version 15, Aug 30, 2023

APPENDIX B

Laboratory Test Programs

Laboratory tests were conducted on representative soils for the purpose of classification and for the determination of the physical properties and engineering characteristics. The number and selection of the types of testing for a given study are based on the geotechnical conditions of the site. A summary of the various laboratory tests performed for the project is presented below.

Moisture Content and Dry Density (D2937):

Data obtained from these tests, performed on undisturbed samples are used to aid in the classification and correlation of the soils and to provide qualitative information regarding soil strength and compressibility.

Direct Shear (D3080):

Data obtained from this test performed at increased and field moisture conditions on relatively remolded soil sample is used to evaluate soil shear strengths. Samples contained in brass sampler rings, placed directly on test apparatus are sheared at a constant strain rate of 0.002 inch per minute under saturated conditions and under varying loads appropriate to represent anticipated structural loadings. Shearing deformations are recorded to failure. Peak and/or residual shear strengths are obtained from the measured shearing load versus deflection curve. Test results, plotted on graphical form, are presented on Plate B-1 of this section.

Consolidation (D2835):

Drive-tube samples are tested at their field moisture contents and at increased moisture conditions since the soils may become saturated during lifetime use of the planned structure.

Data obtained from this test performed on relatively undisturbed and/or remolded samples, were used to evaluate the consolidation characteristics of foundation soils under anticipated foundation loadings. Preparation for this test involved trimming the sample, placing it in a one-inch-high brass ring, and loading it into the test apparatus which contained porous stones to accommodate drainage during testing. Normal axial loads are applied at a load increment ratio, successive loads being generally twice the preceding.

Soil samples are usually under light normal load conditions to accommodate seating of the apparatus. Samples were tested at the field moisture conditions at a predetermined normal load. Potentially moisture sensitive soil typically demonstrated significant volume change with the introduction of free water. The results of the consolidation tests are presented in graphical forms on Plate B-2.

Laboratory Test Results

Table I: Max. Density/Optimum Moisture Content (ASTM D1557)

Sample Location @ Depth, feet	Max. Dry Density, pcf	Optimum Moisture Content, %
B-1 @ 0-3 SAND – GP-SP Tannish light brown, gravel sand mixture, fine to coarse with trace silts, rock fragments, rocks, and cobbles	133	8.0

Table III: Direct Shear (ASTM D3080)

Test Boring No. @ Sample Depth, feet	Test Condition	Cohesion, psf	Friction, degrees
B-1 @ 0-3	Remolded to 90%	640	39

Table IV: Consolidation (ASTM D2435)

Boring No., B	Depth, feet	Consolidation prior to saturation, % @ 2 kips	Hydro Collapse, % @ 2 kips	Total Consolidation, % @ 8 kips (saturated)
1 (remolded)	0-3	0.5	0.1	1.8

Table V: Sand Equivalent, SE (ASTM D2419)

Sample Location @ depth, feet	**Sand Equivalent Average, SE**
B-3 @ 0-3.0	55.9
B-6 @ 0-3.0	46.7

Table VI: Sieve Analysis (ASTM D422)

SAMPLE: B-6 @ 0-3 feet

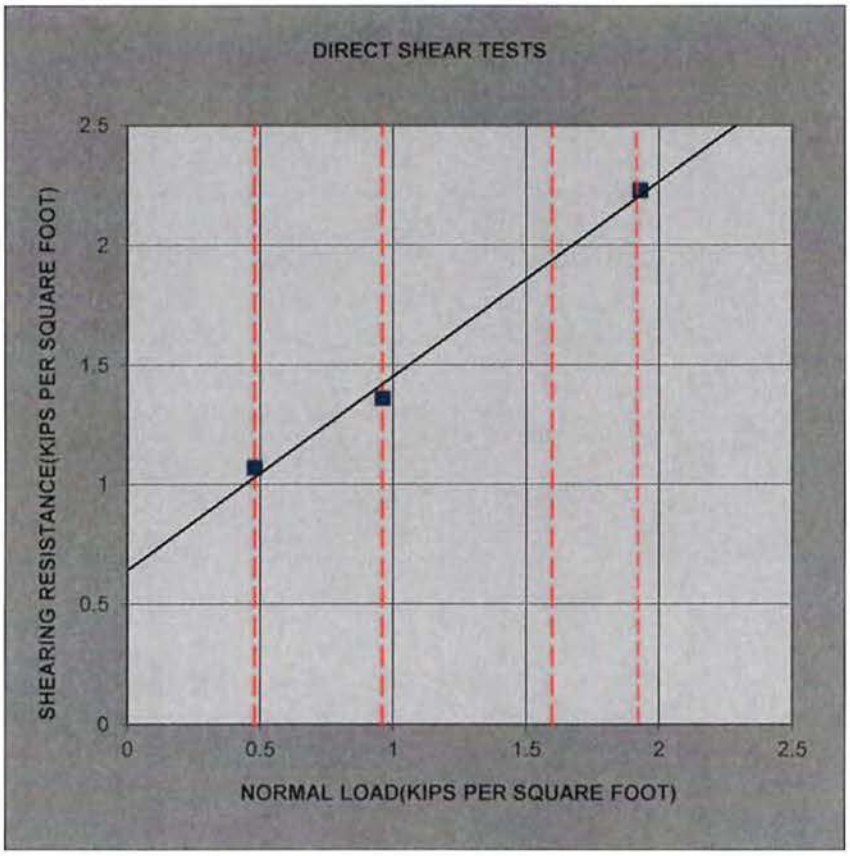
Grain Size	% Retained
Gravels	33
Medium to Coarse	37
Fines	18
Silts	12

Table VII: Soils' Chemical Test Results at Sample Location B-1 @ 0-3 feet

Sample	Method	Result	Units	Remarks
pH	EPA 9040 B	7.93	units	Not corrosive
Resistivity	SM 2510B	3,640	ohms-cm	Moderately corrosive
Chloride	EPA 300.0	29	mg/kg	Not corrosive
Sulfate	EPA 300.0	82	mg/kg	Not corrosive

Table VIII: Soils' Density Correlation to SPT Blow Counts

Density/Consistency		1" Soil Tube -- Blows Per Foot			Standard Penetration Blows Per Foot
Granular	Cohesive	Sand and Gravel	Silt	Clay	
Very Loose	Very Soft	0-50	0-50	0-60	0-5
Loose	Soft	50-100	50-180	60-250	5-10
Slightly Compact	Stiff	100-350	180-1000	250-1000	10-20
Compact	Very Stiff	350-525	1000-2000	1000-4000	20-35
Dense	Hard	525-1500	2000-5000	4000-5000	35-70
Very Dense	Very Hard	1500+	5000+	5000+	70+



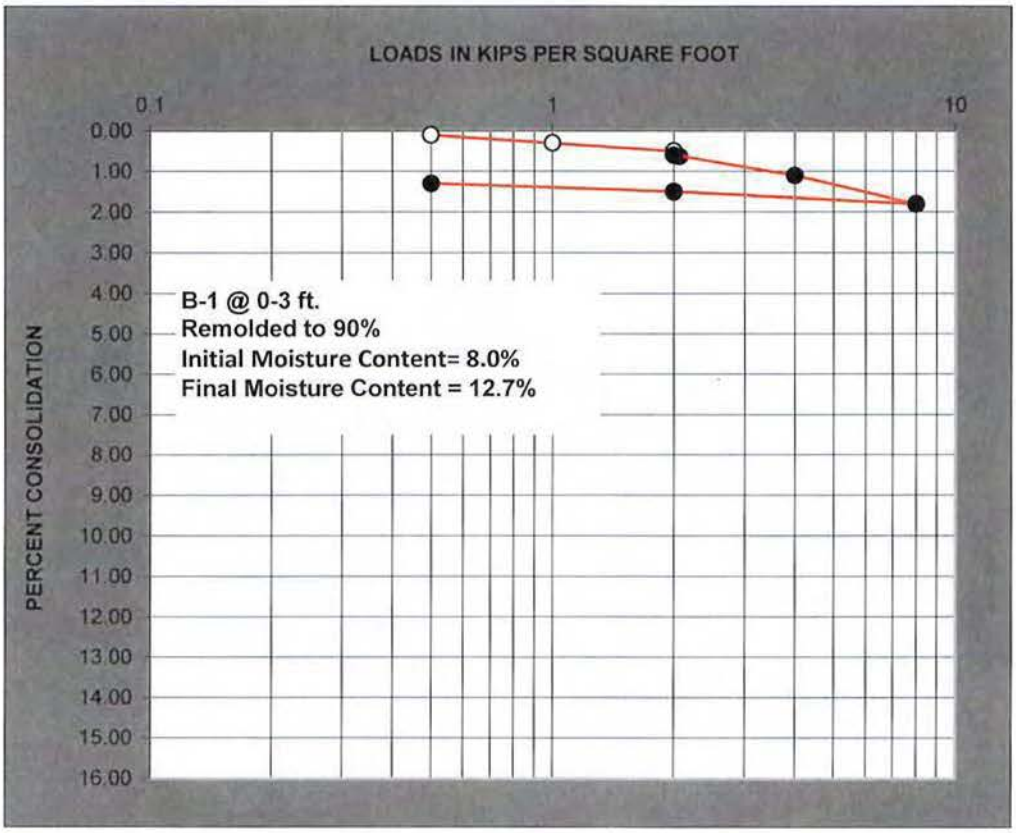
SYMBOL	LOCATION	DEPTH (FT)	TEST CONDITION	COHESION (psf)	FRICTION (degree)
■	B-1	0 to 3	Remolded to 90%	640.10	39.08

Proposed Administrative Office and Maintenance Structures
400 E. 20th Street
Upland, California

PROJECT NO.	24036-F
PLATE	B-1

SOILS SOUTHWEST, INC.
Consulting Foundation Engineers

CONSOLIDATION TESTS



- **WATER PERMITTED TO CONTACT SAMPLE**

	PROJECT	Proposed Adiminstrative Office and Maintenance Structures 400 E. 20th Street		
	PROJECT NO.	24036-F	PLATE	B-2

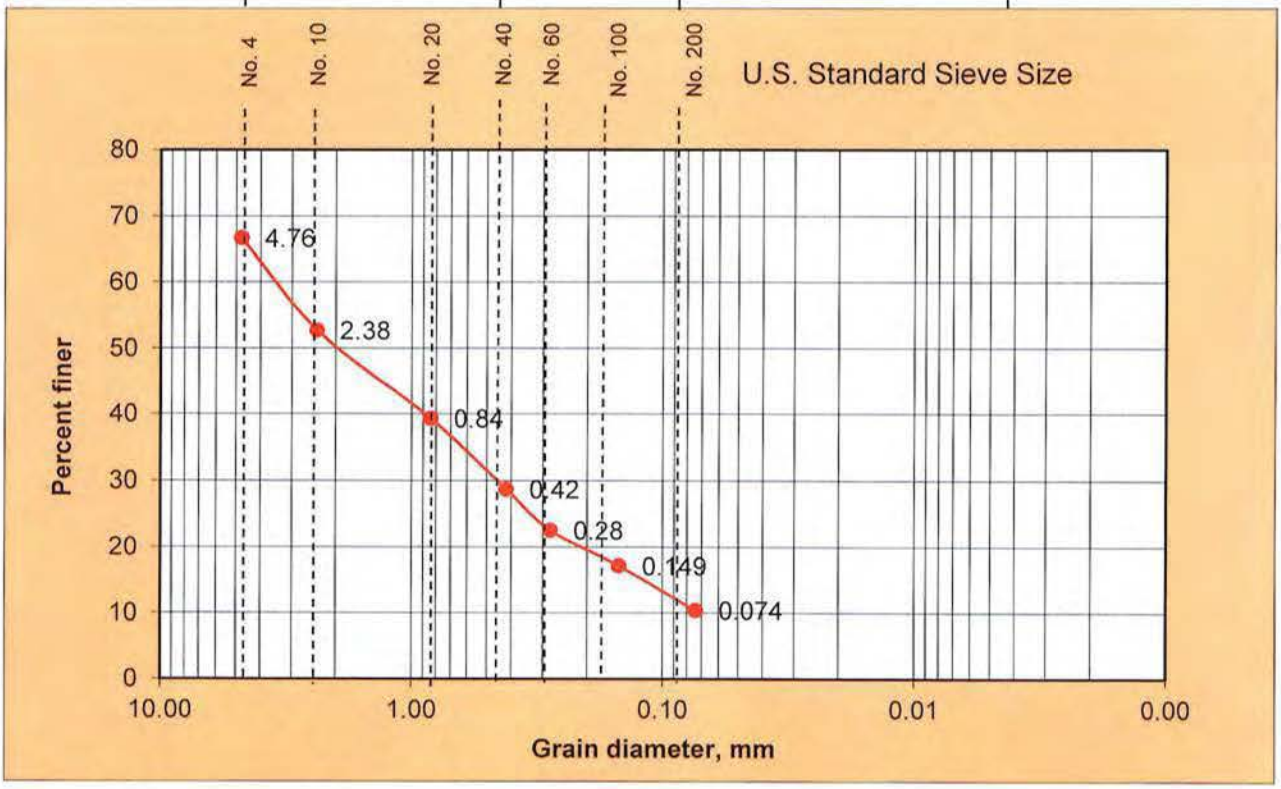
SOILS SOUTHWEST INC.
Consulting Foundation Engineers

GRAIN SIZE DISTRIBUTION

Project: San Antonio Water District HDQ **Job #** 24036-F
Location: 400 E. 20th Street, Upland **Boring No:** B-6/P2@0-3' **Sample No:** 1
Description of Soil: GP-SP
Date of Sample: 8/9/2024
Tested By: JG **Date of Testing:** 8/16/2024

Sieve No.	Sieve Openings in mm	Percent Finer	Grain Size	% Retained
4	4.76	66.74	Gravel	33
10	2.38	52.74	Med. to Crs	37
20	0.84	39.34	Fines	18
40	0.42	28.74	Silts	12
60	0.28	22.54		
100	0.149	17.20		
200	0.074	10.44		

Gravel	Sand			
	Coarse to Medium	Fine	Silt	Clay



Visual Soil Description : GRAVEL/SAND mixture with trace silts, fine to coarse with rock fragments, rocks, and cobbles

Soil Classification: GP-SP

System: USC

SOILS SOUTHWEST INC.
Consulting Foundation Engineers

SAND EQUIVALENT TEST

Test Date: August 16,2024

Project No.: 24036-F/PV

Job Name: San Antonio Water District Headquarters
400 E. 20th Street
Upland

Sample Location: B-6/PV-2 @ 0-3ft

Sample by: JF Tested by: JG

LABORATORY DATA

SAMPLE NO.	1	2	3	4
TIME START	6:13	6:18	6:23	
TIME SOAK (10 min.)	6:23	6:28	6:33	
TIME AT LEVEL 15ML	6:25	6:30	6:35	
TIME of READING (20-min)	6:45	6:50	6:55	
FINE, ML	5.8	5.6	5.7	
COARSE, ML	2.8	2.6	2.6	
SE = 100x (coarse/fine)	48.27	46.42	45.61	
SE Average	46.76			

SAND EQUIVALENT TEST

Test Date: August 15,2024

Project No.: 24036-F/PV

Job Name: San Antonio Water District Headquarters
400 E. 20th Street
Upland

Sample Location: B-3/PV-1 @ 0-3ft

Sample by: JF Tested by: JG

LABORATORY DATA

SAMPLE NO.	1	2	3	4
TIME START	1:52	1:57	2:02	
TIME SOAK (10 min.)	2:02	2:07	2:12	
TIME AT LEVEL 15ML	2:04	2:09	2:14	
TIME of READING (20-min)	2:24	2:29	2:34	
FINE, ML	6.0	5.8	5.7	
COARSE, ML	3.6	3.0	3.2	
SE = 100x (coarse/fine)	60	51.7	56.1	
SE Average	55.9			

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CASE NARRATIVE

Authorized Signature Name / Title (print)	Ken Zheng, President
Signature / Date	Ken Zheng, President 08/19/2024 18:03:02
Laboratory Job No. (Certificate of Analysis No.)	2408-00123
Project Name / No.	24036-F SAN ANTONIO WTR DIST. / 400 E. 20th ST., UPLAND
Dates Sampled (from/to)	08/14/24 To 08/14/24
Dates Received (from/to)	08/15/24 To 08/15/24
Dates Reported (from/to)	08/19/24 To 8/19/2024
Chains of Custody Received	Yes

Comments:

Subcontracting

Inorganic Analyses

No analyses sub-contracted

Other Analyses

No analyses sub-contracted

Sample Condition(s)

All samples intact

Positive Results (Organic Compounds)

None

The data and information on this, and other accompanying documents, represent only the sample(s) analyzed and is rendered upon condition that it is not to be reproduced, wholly or in part, for advertising or other purposes without approval from the laboratory.

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CERTIFICATE OF ANALYSIS

2408-00123

SOILS SOUTHWEST INC
MOLOY GUPTA
897 VIA LATA SUITE N
COLTON, CA 92324

Date Reported	08/19/24
Date Received	08/15/24
Invoice No.	2349
Cust #	S192
Permit Number	
Customer P.O.	

Project: 24036-F SAN ANTONIO WTR DIST. / 400 E. 20th ST., UPLAND

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 001 **B-1@0-3ft**					Date & Time Sampled:		08/14/24 @	10:00
Sample Matrix: **Soil**								
pH@25C-as Dissolved in Wtr	**7.93**		units	EPA 9040 B	1.0	0	08/15/24	DV
Resistivity	**3640**		ohms/cm	SM 2510B	1.0	1.0	08/15/24	DV
Chloride	**29**		mg/Kg	EPA 300.0 (1993 Rev 2.:	1.0	5.0	08/18/24	TLB
Sulfate	**82**		mg/Kg	EPA 300.0 (1993 Rev 2.:	1.0	5.0	08/18/24	TLB

Respectfully Submitted: Ken Zheng

Ken Zheng - Lab Director

QUALIFIERS

B = Detected in the associated Method Blank at a concentration above the routine RL.
B1 = BOD dilution water is over specifications . The reported result may be biased high.
D = Surrogate recoveries are not calculated due to sample dilution.
E = Estimated value; Value exceeds calibration level of instrument.
H = Analyte was prepared and/or analyzed outside of the analytical method holding time
I = Matrix Interference.
J = Analyte concentration detected between RL and MDL.
Q = One or more quality control criteria did not meet specifications. See Comments for further explanation.
S = Customer provided specification limit exceeded.

ABBREVIATIONS

DF = Dilution Factor
RL = Reporting Limit, Adjusted by DF
MDL = Method Detection Limit, Adjusted by DF
Qual = Qualifier
Tech = Technician

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USDA-EPA-NIOSH Testing Food Sanitation Consulting Chemical and Microbiological Analyses and Research

ARL

A & R Laboratories
1650 S. Grove Ave., Ste C, Ontario, CA 91761
Tel: 951-779-0310 / 909-781-6335 Fax: 951-779-0344
E-mail: office@arlaboratories.com

CHAIN OF CUSTODY

A & R Work Order #: 2408-123

Page 1 of 1

Client Name: Soils Southwest, Inc.
E-mail: soilssouthwest@aol.com
Address: 897 Via Lata, Suite N, Colton CA
Report Attention: Moloy G. | Phone # 909-370-0474 | Fax: # | Sampled By: John Flippin
Project No./ Name: 24036-F | Project Site: 400 East 20th Street, Upland

☒ Chilled
☒ Intact
☐ Seal

Turn Around Time Requested: ☐ Rush 8 12 24 48 Hours ☑ Normal

Lab # (Lab use)	Client Sample ID	Sample Collection Date	Sample Collection Time	Matrix Type	Sample Preserve	No., type* & size of container	EPA8260B (VOCs & Oxygenates)	EPA8260B(BTEX & Oxygenates)	8260B / 8015 (Gasoline)	8015 (Diesel)	EPA8081A (Organochlorine Pesticides)	EPA 8082 (PCBs)	EPA 8015M (Carbon Chain C4-C40)	EPA 6010B/7000 (CAM 17 Metals)	Micro: Plate Cnt., Coliform, E-Coli	Sulfate	Chloride	pH	Resistivity			Remarks
1	B-1 @ 0-3 ft	8/14/24	10:00 AM	Soil	Jar	4 ounce										✓	✓	✓	✓			

L San Antonio Water District

Relinquished By	Company	Date	Time	Received By	Company	Date	Time
[signature]	SSW	8/15	9:23	[signature]		8/15/24	9:23
Relinquished By	Company	Date	Time	Received By	Company	Date	Time

Note: Samples are discarded 30 days after results are reported unless other arrangements are made.

Matrix Code: DW=Drinking Water; GW=Ground Water; WW=Waste Water; SD=Solid Waste; SL=Sludge; SS=Soil/Sediment; AR=Air; PP=Pure Product

Preservative Code: IC=Ice; HC=HCl; HN=HNO_3; SH=NaOH; ST=$Na_2S_2O_3$; HS=H_2SO_4

* Sample Container Types: T=Tedlar Air Bag; G=Glass Container; ST= Steel Tube; B= Brass Tube; P=Plastic Bottle; V=VOA Vial; E= EnCore

Sample Acceptance Checklist

CLIENT: Soils Southwest WORK ORDER NUMBER: 2408-123

Temperature:(Criteria:0.0°C-6.0°C)

Sample Temp. (°C) 5.6c ID#: 22-0030

- [ ] Sample(s) outside temprature criteria: PM contacted by :
- [ ] Sample(s) outside temprature criteria, but received on ice/chilled on same day of sampling.
- [ ] Sample(s) received at ambient temprature; placed on ice for transport by courier.

CUSTODY SEAL:

Cooler	[ ]	Present and Intact	[ ]	Present and Not Intact	[X]	Not Present
Sample(s)	[ ]	Present and Intact	[ ]	Present and Not Intact	[X]	Not Present

Sample Condition:	Yes	No	N/A
Was a COC received	X		
Were sample IDs present?	X		
Were sampling dates & times present?	X		
Was a relingquished signature present?	X		
Were the tests required clearly indicated?	X		
Were all samples sealed in plastic bags?		X	Soil
Did all bottle labels agree with COC? (ID, dates and times)	X		
Were correct containers used for the tests required?	X		
Was a sufficient amount of samples sent for tests indicated?	X		
Was there headspace in VOA vials?			X
Were the containers labeled with correct preservatives?			X

Explanations/Comments:

Notification:

For discrepancies, how was the Project Manager notified?

Verbal: PM Initials: _____ Data/Time: _____

Email: Send to: _____ Data/Time: _____

Project Manager's response:

Completed By: [signature] Date: 8/15/24

A R Laboratories
1650 S. Grove Ave., Suite C, Ontario, CA 91761
PH: 909-781-6335
Email: office@arlaboratories.com

ANAHEIM TEST LAB, INC

196 Technology Drive, Unit D
Irvine, CA 92618
Phone (949) 336-6544

TO:

SOILS SOUTHWEST, INC.
897 VIA LATA, SUITE N
COLTON, CA. 92324

DATE: 8/26/2024

P.O. NO.: Verbal

LAB NO.: C-8132

SPECIFICATION: CA 301

MATERIAL: Brown, Silty Sand w. Gravel

Project No.: 24036-F
Project: San Antonio Water District HDQ
400 East 20th St, Upland, CA
Sample ID: B-6/PV-2 @ 0-3'
Sample Date: 8/16/2024

ANALYTICAL REPORT
"R" VALUE

BY EXUDATION	BY EXPANSION
75	N/A

RESPECTFULLY SUBMITTED

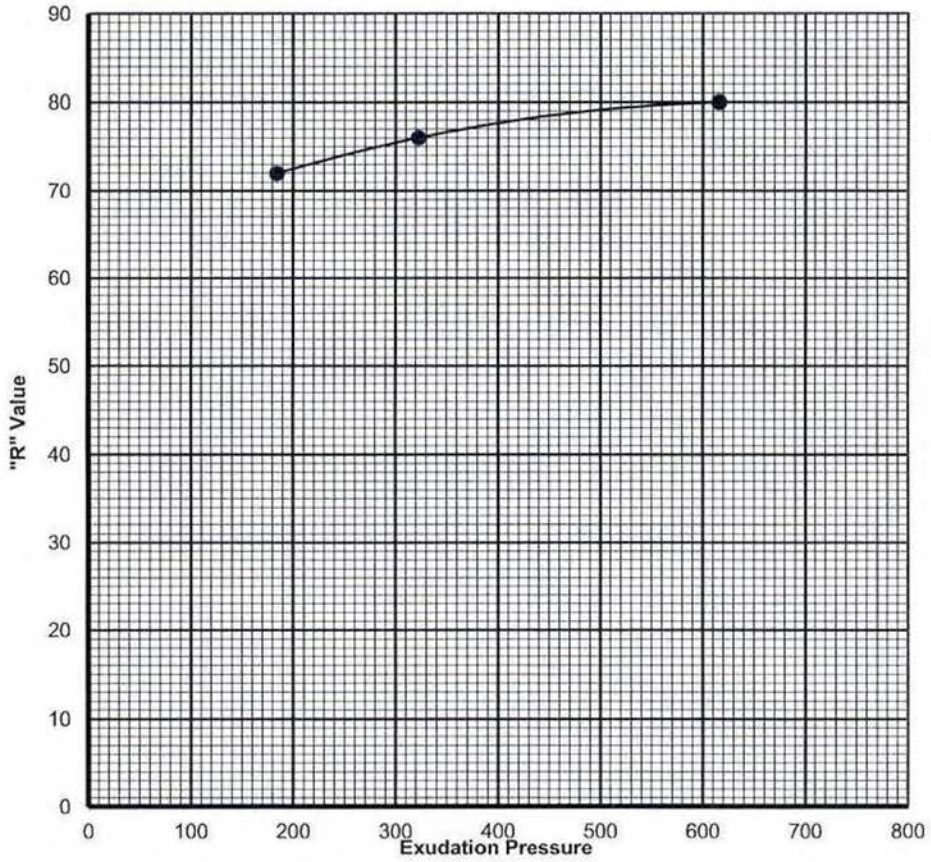
WES BRIDGER LAB MANAGER

"R" VALUE CA 301

Client: Soils Southwest, Inc. **ATL No.:** C 8132 **Date:** 8/26/2024
Client Reference No.: 24036-F
Sample: B-6/PV-2 @ 0-3' **Soil Type:** Brown, Silty Sand w. Gravel

TEST SPECIMEN		A	B	C	D
Compactor Air Pressure	psi	350	350	350	
Initial Moisture Content	%	2.0	2.0	2.0	
Moisture at Compaction	%	7.6	7.1	7.3	
Briquette Height	in.	2.45	2.46	2.49	
Dry Density	pcf	135.5	134.2	134.8	
EXUDATION PRESSURE	psi	184	616	322	
EXPANSION PRESSURE	psf	0	0	0	
Ph at 1000 pounds	psi	20	13	16	
Ph at 2000 pounds	psi	35	22	28	
Displacement	turns	3.45	3.86	3.81	
"R" Value		72	80	76	
CORRECTED "R" VALUE		72	80	76	

Final "R" Value	
BY EXUDATION: @ 300 psi	**75**
BY EXPANSION: TI = 5.0	**N/A**

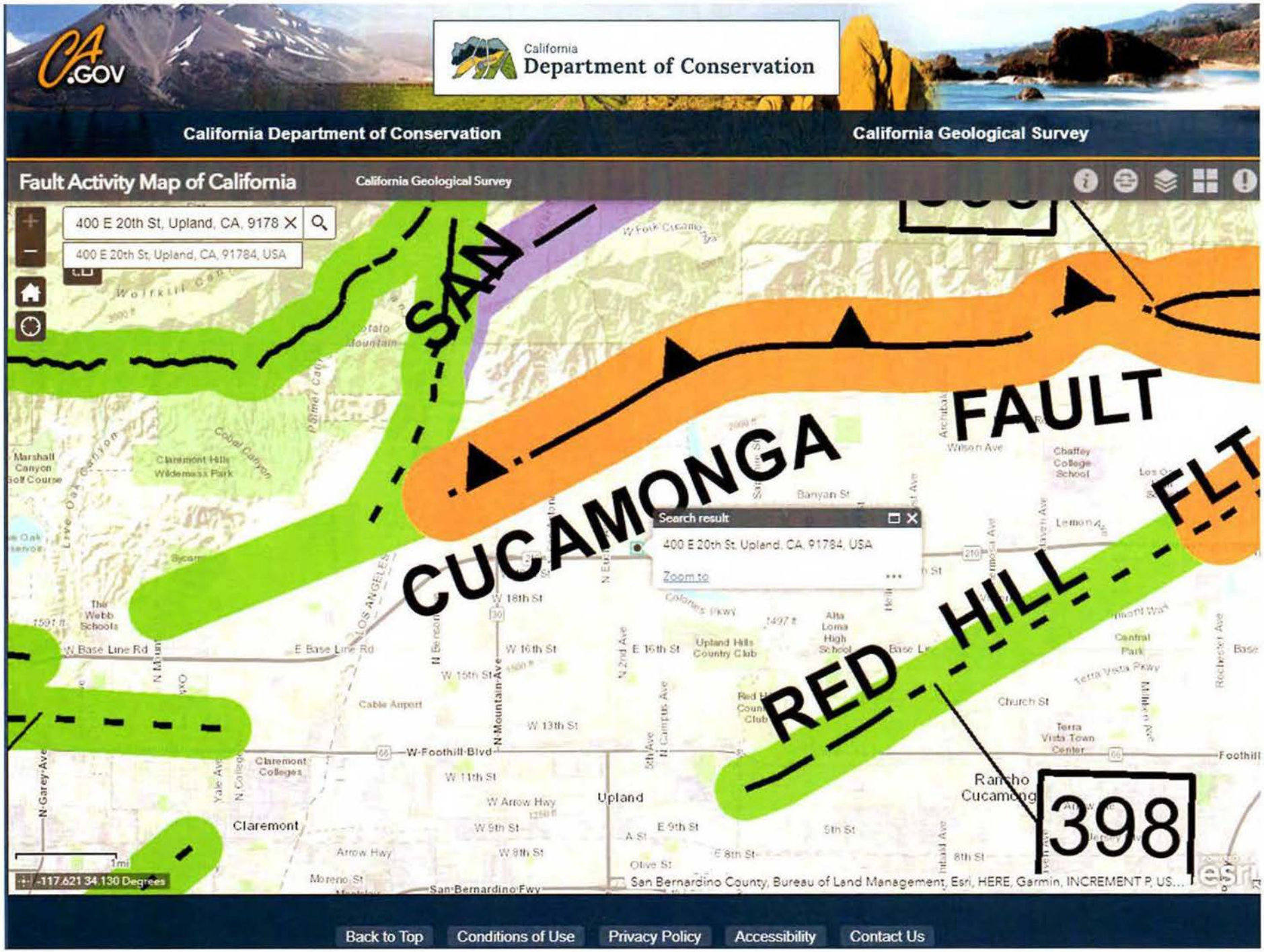


APPENDIX C

Supplemental Seismic Design Parameters

&

FEMA National Flood Hazard Layer Map


CA.GOV
California
Department of Conservation
California Department of Conservation
California Geological Survey
Fault Activity Map of California
California Geological Survey
400 E 20th St, Upland, CA, 9178
400 E 20th St, Upland, CA, 91784, USA
SAN
CUCAMONGA
FAULT
RED HILL FLT
Search result
400 E 20th St, Upland, CA, 91784, USA
Zoom to
Marshall Canyon Golf Course
Claremont Hills Wilderness Park
Live Oak Canyon
Cobal Canyon
Wolfskill Canyon
Potato Mountain
Wilson Ave
Chaffey College School
Banyan St
Lemon Ave
W 18th St
W 16th St
E 16th St
W 15th St
W 13th St
W Base Line Rd
E Base Line Rd
N Mountain Ave
N 2nd Ave
N Campus Ave
Upland Hills Country Club
Alta Loma High School
Central Park
Terra Vista Town Center
Church St
Cable Airport
W Foothill Blvd
Foothill
Claremont Colleges
Claremont
W 11th St
W Arrow Hwy
Arrow Hwy
Upland
E 9th St
W 9th St
W 8th St
E 8th St
5th St
8th St
Olive St
Moreno St
San Bernardino Fwy
Rancho Cucamonga
398
1mi
-117.621 34.130 Degrees
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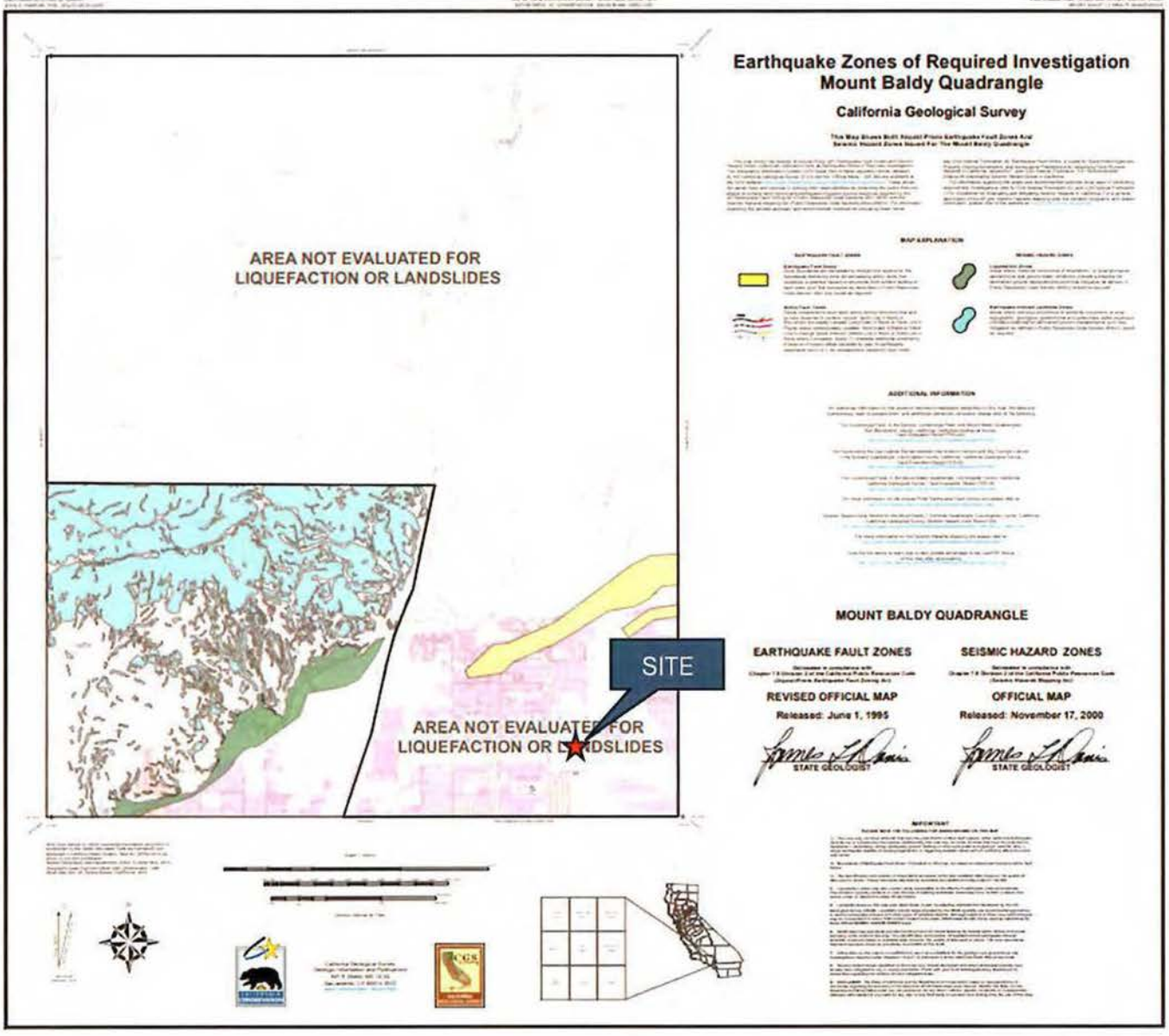

Earthquake Zones of Required Investigation
Mount Baldy Quadrangle
California Geological Survey
AREA NOT EVALUATED FOR
LIQUEFACTION OR LANDSLIDES
SITE
AREA NOT EVALUATED FOR
LIQUEFACTION OR LANDSLIDES
MOUNT BALDY QUADRANGLE
EARTHQUAKE FAULT ZONES
REVISED OFFICIAL MAP
Released: June 1, 1995
STATE GEOLOGIST
SEISMIC HAZARD ZONES
OFFICIAL MAP
Released: November 17, 2000
STATE GEOLOGIST

ASCE Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: III
Soil Class: D - Stiff Soil

Latitude: 34.135692
Longitude: -117.64504
Elevation: 1649.1604629371752 ft (NAVD 88)

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

Seismic

Site Soil Class: D - Stiff Soil

Results:

S_S :	1.766	S_{D1} :	N/A
S_1 :	0.658	T_L :	12
F_a :	1	PGA :	0.753
F_v :	N/A	PGA_M :	0.829
S_{MS} :	1.766	F_{PGA} :	1.1
S_{M1} :	N/A	I_e :	1.25
S_{DS} :	1.177	C_v :	1.453

Ground motion hazard analysis may be required. See ASCE/SEI 7-16 Section 11.4.8.

Data Accessed: Mon Jul 22 2024

Date Source: USGS Seismic Design Maps

U.S. Geological Survey - Earthquake Hazards Program

2008 National Seismic Hazard Maps - Source Parameters

New Search

Distance in Miles	Name	State	Pref Slip Rate (mm/yr)	Dip (degrees)	Dip Dir	Slip Sense	Rupture Top (km)	Rupture Bottom (km)	Length (km)
1.30	Cucamonga	CA	5	45	N	thrust	0	8	28
3.02	San Jose	CA	0.5	74	NW	strike slip	0	15	20
5.56	Sierra Madre	CA	2	53	N	reverse	0	14	57
5.56	Sierra Madre Connected	CA	2	51		reverse	0	14	76
9.14	Chino, alt 2	CA	1	65	SW	strike slip	0	14	29
9.22	Chino, alt 1	CA	1	50	SW	strike slip	0	9	24
11.28	San Jacinto;SBV+SJV+A	CA	n/a	90	V	strike slip	0	16	134
11.28	San Jacinto;SBV+SJV	CA	n/a	90	V	strike slip	0	16	88
11.28	San Jacinto;SBV+SJV+A+C	CA	n/a	90	V	strike slip	0	17	181
11.28	San Jacinto;SBV+SJV+A+CC	CA	n/a	90	V	strike slip	0	16	181
11.28	San Jacinto;SBV	CA	6	90	V	strike slip	0	16	45
11.28	San Jacinto;SBV+SJV+A+CC+B+SM	CA	n/a	90	V	strike slip	0.1	15	241
11.28	San Jacinto;SBV+SJV+A+CC+B	CA	n/a	90	V	strike slip	0.1	15	215
13.53	S. San Andreas;BB+NM+SM+NSB+SSB+BG+CO	CA	n/a	85		strike slip	0.1	13	390
13.53	S. San Andreas;CH+CC+BB+NM+SM+NSB+SSB+BG+CO	CA	n/a	86		strike slip	0.1	13	512
13.53	S. San Andreas;NSB+SSB+BG+CO	CA	n/a	79		strike slip	0.2	12	206
13.53	S. San Andreas;BB+NM+SM+NSB	CA	n/a	90	V	strike slip	0	14	220

U.S. Geological Survey - Earthquake Hazards Program

2008 National Seismic Hazard Maps - Source Parameters

New Search

Fault Name	State
Cucamonga	**California**

GEOMETRY	
Dip (degrees)	45
Dip direction	N
Sense of slip	thrust
Rupture top (km)	0
Rupture bottom (km)	8
Rake (degrees)	90
Length (km)	28

MODEL VALUES		
Slip Rate	5	
Probability of activity	1	
	ELLSWORTH	HANKS
Minimum magnitude	6.5	6.5
Maximum magnitude	6.70	6.50
b-value	0.8	0.8

Fault Model	Deformation Model	Char Rate[1]	GR-a-value[1]	Weight
Stitched	2.1	3.31e-03 / 6.61e-03	2.648 / NA	0.50
UnStitched	2.1	3.31e-03 / 6.61e-03	2.648 / NA	0.50
Stitched	2.4	3.31e-03 / 6.61e-03	2.648 / NA	0.50
UnStitched	2.4	3.31e-03 / 6.61e-03	2.648 / NA	0.50

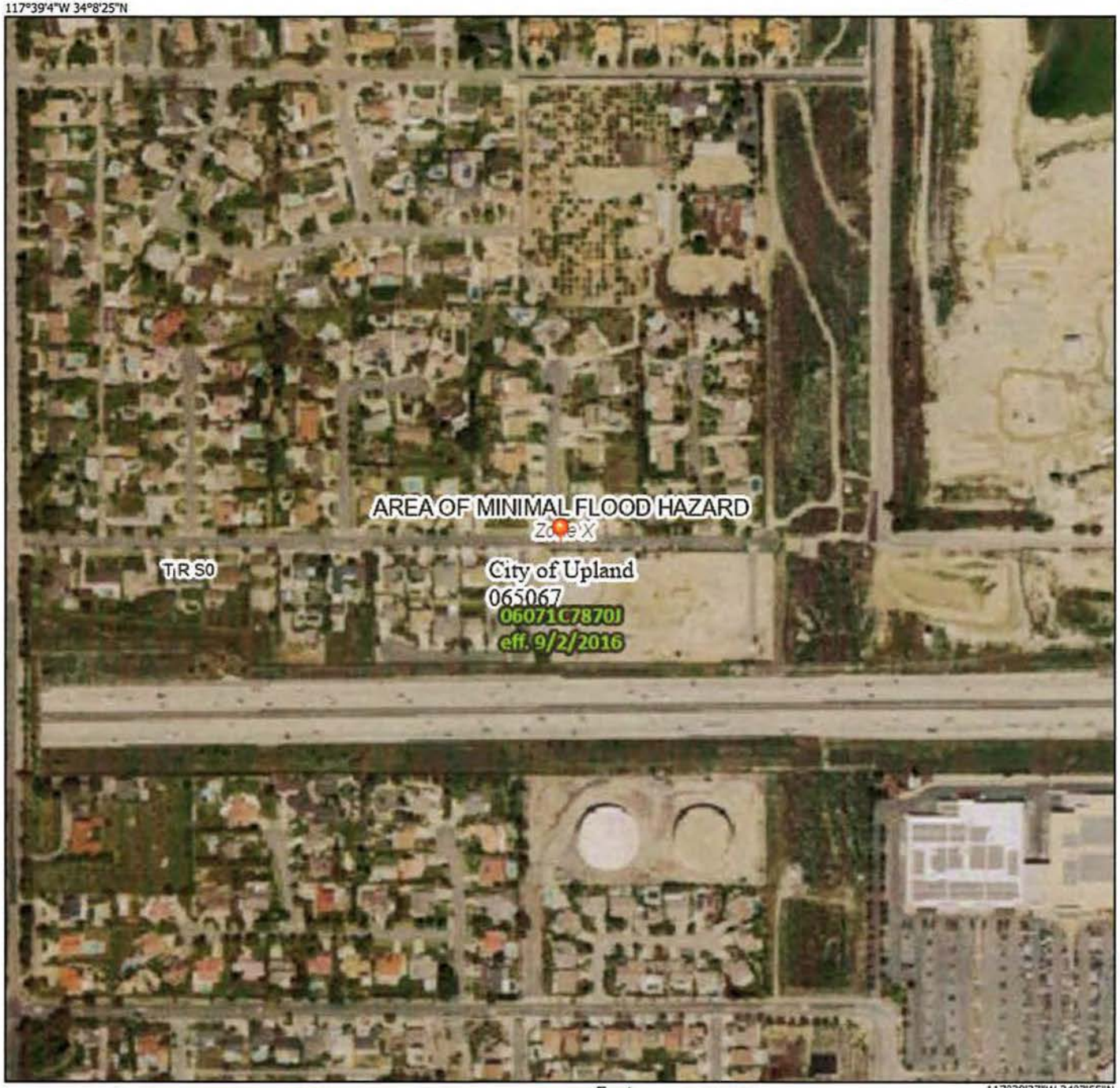
[1] 1st Value is based on Ellsworth relation and 2nd value is based on Hanks and Bakun relation

Comments

Slip rate based on cumulative vertical displacement across three strands reported by Morton and Matti (1987, 1991).

National Flood Hazard Layer FIRMette

FEMA



Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 7/22/2024 at 3:06 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

APPENDIX D

Field Infiltration Test Data
Porchet Method Calculation Summary

Conversion Table (Porchet Method)
San Antonio Water District Headquarters
400 E. 20th Street, Upland
Project No. 24036-BMP

Test N no.	Test Hole Depth (inches) D_T	Time Interval Δ_T	Initial Depth (inches) D_O (in)	Final Depth (inches) D_f (in)	Initial Water Height (inches) $H_O=D_T-D_O$	Final Water Height (inches) $H_f = D_T-D_f$	Change Height/Time $\Delta H/\Delta D= H_O-H_f$	Average Head Height/Time $Havg = (H_O+H_f)/2$
P-1	36	10	12	35.5	24	0.5	23.5	12.25
P-2	60	10	36	56.5	24	3.5	20.5	13.75
P-3	Test at required depth could not be performed							
P-4	Test at required depth could not be performed							

	Observed Infiltration Rate (It) = ΔH60r/Δt (r+2Havg)		
	A	B	C
	ΔH60r	Δt (r+2H_{avg})	A/B= inch/hr
P-1	5640	285	**19.79**
P-2	4920	315	**15.62**
P-3			
P-4			

Legend

Δ H/ΔD = Observed Field Rate

H_O = inches of water filled from bottom

D_O = initial height of water (inches) from bottom

D_f = final heigh of water (inches) from bottom

Columns A-B-C : Porchet Conversion Calculations

Column C: Observed Rate following Porchet Conversion

D_t = depth of test hole bottom (inches)

Percolation Test Data Sheet

Project: SAN ANTONIO WATER DISTRICT HDQ - UPLAND			Project No. 24036	
Test Hole No:	P-1	Tested By: JG	Date: 8-9-24	
Depth of Test Hole, D_T	36	USCS Soil Classification		
Test Hole Dimensions (inches)			Length	Width
Diameter (if round)=	8.0 in.	Sides (if rectangular)=		

Sandy Soil Criteria Test *

Trial No.	Start Time	Stop Time	Δt Time Interval (min)	D_o Initial Depth to Water (in.)	D_f Final Depth to Water (in.)	ΔD Change in Water Level (in.)	Greater Than or Equal to 6.0 Inches??? (Y/N)
1	10:38	10:45	25	12	36	24	Y
2	10:45	10:55	25	12	36	24	Y

* If two consective measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fiill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25."

Trial No.	Start Time	Stop Time	Δt Time Interval (min)	D_o Initial Depth to Water (in.)	D_f Final Depth to Water (in.)	ΔD Change in Water Level (in.)	ΔT/ΔD Percolation Rate (min./in.)
1	10:56	11:06	10	12	36	24	0.42
2	11:07	11:17	10	12	36	24	0.42
3	11:18	11:28	10	12	36	24	0.42
4	11:29	11:39	10	12	36	24	0.42
5	11:40	11:50	10	12	35.5	23.5	0.43
6	11:51	12:01	10	12	35.5	23.5	0.43
7	12:01	12:11	10	12	35.5	23.5	0.43
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							

Comments

Percolation Test Data Sheet

Project: SAN ANTONIO WATER DISTRICT HDQ - UPLAND				Project No. 24036	
Test Hole No:	P-2		Tested By: JG		Date: 8-9-24
Depth of Test Hole, D_T	60		USCS Soil Classification		
Test Hole Dimensions (inches)				Length	Width
Diameter (if round)=	8.0 in.	Sides (if rectangular)=			

Sandy Soil Criteria Test *

Trial No.	Start Time	Stop Time	Δt Time Interval (min)	D_o Initial Depth to Water (in.)	D_f Final Depth to Water (in.)	ΔD Change in Water Level (in.)	Greater Than or Equal to 6.0 inches??? (Y/N)
1	10:49	11:04	25	36	60	24	Y
2	11:05	11:20	25	36	60	24	Y

* If two consective measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fiill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25."

Trial No.	Start Time	Stop Time	Δt Time Interval (min)	D_o Initial Depth to Water (in.)	D_f Final Depth to Water (in.)	ΔD Change in Water Level (in.)	ΔT/ΔD Percolation Rate (min./in.)
1	11:21	11:31	10	36	57	21	0.48
2	11:32	11:42	10	36	57	21	0.48
3	11:43	11:52	10	36	57	21	0.48
4	11:54	12:04	10	36	57	21	0.48
5	12:07	12:17	10	36	56.5	20.5	0.49
6	12:18	12:28	10	36	56.5	20.5	0.49
7	12:29	12:39	10	36	56.5	20.5	0.49
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							

Comments

Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 1)

1 Remaining LID DCV not met by site design BMP (ft^3): *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item19*			
BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP) - Use additional forms for more BMPs*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix C of the TGD for WQMP for minimum requirements for assessment methods*	19.79	15.62	
3 Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*			
4 Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*			
5 Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*			
6 Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*			
7 Ponding Depth (ft) *d_{BMP} = Minimum of (1/12*Item 4*Item 5) or Item 6*			
8 Infiltrating surface area, *SA_{BMP}* (ft^2) *the lesser of the area needed for infiltration of full DCV or minimum space requirements from Table 5.7 of the TGD for WQMP*			
9 Amended soil depth, *d_{media}* (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*			
10 Amended soil porosity			
11 Gravel depth, *d_{media}* (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*			
12 Gravel porosity			
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*			
14 Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*			
15 Underground Retention Volume (ft^3) *Volume determined using manufacturer's specifications and calculations*			
16 Total Retention Volume from LID Infiltration BMPs: *(Sum of Items 14 and 15 for all infiltration BMP included in plan)*			
17 Fraction of DCV achieved with infiltration BMP: % *Retention% = Item 16 / Form 4.2-1 Item 7*			
18 Is full LID DCV retained onsite with combination of hydrologic source control and LID retention/infiltration BMPs? Yes ☐ No ☐ *If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the applicable category of development and repeat all above calculations.*			

PROFESSIONAL LIMITATIONS

Our investigation was performed using the degree of care and skill ordinarily exercised, under similar circumstances by other reputable geotechnical engineers practicing in these general or similar localities. No other warranty, expressed or implied, is made as to the conclusions and professional advice included in this report.

The investigations are based on soil samples only, consequently the recommendations provided shall be considered 'preliminary'. The samples taken and used for testing and the observations made are believed representative of site conditions; however, soil and geologic conditions can vary significantly between boring. As in most major projects, conditions revealed by excavations may vary with preliminary findings. If this occurs, the changed conditions must be evaluated by the project geotechnical engineer and designs adjusted as required or alternate design recommended.

The report is issued with the understanding that it is the responsibility of the owner, or of his representative, to ensure that the information and recommendations contained herein are brought to the attention of the project architect and engineers. Appropriate recommendations should be incorporated into structural plans. The necessary steps should be taken to see that out such recommendations in field.

The findings of this report are valid as of this present date. However, changes in the conditions of a property can occur with the passage of time, whether they due to natural process or the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur from legislation or broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside of our control. Therefore, this report is subject to review and should be updated after a period of one year.

RECOMMENDED SERVICES

The review of grading plans and specifications, field observations and testing by a geotechnical representative of this office is integral part of the conclusions and recommendations made in this report. If Soils Southwest, Inc. (SSW) is not retained for these services, the Client agrees to assume SSW's responsibility for any potential claims that may arise during and after construction or during the lifetime use of the structure and its appurtenant.

The recommendations supplied should be considered valid and applicable, provided the following conditions, at a minimum, are met:

i. Pre-grade meeting with the contractor, public agency, and the geotechnical engineer,
ii. Excavated bottom inspections and verifications by the greotechnical engineer prior to backfill placement,
iii. Continuous observations and testing during site preparation and structural fill soils placement,
iv. Observation and inspection of footing trenching prior to steel and concrete placement,
v. Subgrade verifications including plumbing trench backfills prior to concrete slab-on-grade placement,
vi. On and off-site utility trench backfill testing and verifications,
vii. Precise-grading plan review, and
viii. Consultations as required during construction or upon request.

In the event that the above conditions are not strictly fulfilled, Soils Southwest, Inc. will assume no responsibility for any structural distresses during the lifetime use of the development planned.

PROFESSIONAL LIMITATIONS

Our investigation was performed using the degree of care and skill ordinarily exercised, under similar circumstances by other reputable geotechnical engineers practicing in these general or similar localities. No other warranty, expressed or implied, is made as to the conclusions and professional advice included in this report.

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iii. Continuous observations and testing during site preparation and structural fill soils placement,
iv. Observation and inspection of footing trenching prior to steel and concrete placement,
v. Subgrade verifications including plumbing trench backfills prior to concrete slab-on-grade placement,
vi. On and off-site utility trench backfill testing and verifications,
vii. Precise-grading plan review, and
viii. Consultations as required during construction or upon request.

In the event that the above conditions are not strictly fulfilled, Soils Southwest, Inc. will assume no responsibility for any structural distresses during the lifetime use of the development planned.

Infiltration Facility Operations and Maintenance

General Requirements

Infiltration facility maintenance should include frequent inspections to ensure that water infiltrates into the subsurface completely within the recommended infiltration time of 72 hours or less after a storm (see Appendix E for guidance on facility inspection and Appendix F for an infiltration inspection and maintenance checklist).

Maintenance and regular inspections are of primary importance if infiltration basins and trenches are to continue to function as originally designed. A specific maintenance plan shall be developed specific to each facility outlining the schedule and scope of maintenance operations, as well as the documentation and reporting requirements. The following are general maintenance requirements:

1. Regular inspection should determine if the sediment pretreatment structures require routine maintenance.

2. If water is noticed in the basin more than 72 hours after a major storm or in the observation well of the infiltration trench more than 48 hours after a major storm, the infiltration facility may be clogged. Maintenance activities triggered by a potentially clogged facility include:

    - Check for debris/sediment accumulation, rake surface and remove sediment (if any) and evaluate potential sources of sediment and vegetative or other debris (e.g., embankment erosion, channel scour, overhanging trees, etc). If suspected upland sources are outside of the County's jurisdiction, additional pretreatment operations (e.g., trash racks, vegetated swales, etc.) may be necessary.

    - For basins, removal of the top layer of native soil may be required to restore infiltrative capacity.

    - For trenches, assess the condition of the top aggregate layer for sediment buildup and crusting. Remove top layer of pea gravel and replace. If slow draining conditions persist, entire trench may need to be excavated and replaced.

3. Any debris or algae growth located on top of the infiltration facility should be removed and disposed of properly.

4. Facilities should be inspected annually. Trash and debris should be removed as needed, but at least annually prior to the beginning of the wet season.

5. Site vegetation should be maintained as frequently as necessary to maintain the aesthetic appearance of the site, and as follows:

    - Vegetation, large shrubs, or trees that limit access or interfere with basin operation should be pruned or removed.

- Slope areas that have become bare should be revegetated and eroded areas should be regraded prior to being revegetated.
- Grass should be mowed to 4"-9" high and grass clippings should be removed.
- Fallen leaves and debris from deciduous plant foliage should be raked and removed.
- Invasive vegetation, such as Alligatorweed (*Alternanthera philoxeroides*), Halogeton (*Halogeton glomeratus*), Spotted Knapweed (*Centaurea maculosa*), Giant Reed (*Arundo donax*), Castor Bean (*Ricinus communis*), Perennial Pepperweed (*Lepidium latifolium*), and Yellow Starthistle (*Centaurea solstitalis*) must be removed and replaced with non-invasive species. Invasive species should never contribute more than 25% of the vegetated area. For more information on invasive weeds, including biology and control of listed weeds, look at the "encycloweedia" located at the California Department of Food and Agriculture website at http://www.cdfa.ca.gov/wma or the California Invasive Plant Council website at http://portal.cal-ipc.org/weedlist. .
- Dead vegetation should be removed if it exceeds 10% of area coverage. Vegetation should be replaced immediately to maintain cover density and control erosion where soils are exposed.

6. For infiltration basins, sediment buildup exceeding 50% of the forebay sediment storage capacity, as indicated by the steel markers, should be removed. Sediment from the remainder of the basin should be removed when 6 inches of sediment accumulates. Sediments should be tested for toxic substance accumulation in compliance with current disposal requirements if visual or olfactory indications of pollution are noticed. If toxic substances are encountered at concentrations exceeding thresholds of Title 22, Section 66261 of the California Code of Regulations, the sediment must be disposed of in a hazardous waste landfill and the source of the contaminated sediments should be investigated and mitigated to the extent possible.

7. Following sediment removal activities, replanting and/or reseeding of vegetation may be required for reestablishment.

Maintenance Standards

A summary of the routine and major maintenance activities recommended for infiltration facilities is shown in Table 6-1. Detailed routine and major maintenance standards are listed in Tables 6-2 and 6-3.

Table 6-1: Infiltration Facility Routine and Major Maintenance Quick Guide

Inspection and Maintenance Activities Summary	
Routine Maintenance	• Remove trash and debris as required • Repair and reseed erosion near inlet if necessary • Remove any visual evidence of contamination from floatables such as oil and grease • Clean under-drain (if present) and outlet piping to alleviate ponding and restore infiltrative capacity. • Remove minor sediment accumulation, debris and obstructions near inlet and outlet structures as needed • Mow routinely to maintain ideal grass height and to suppress weeds • Periodically observe function under wet weather conditions • Take photographs before and after maintenance (encouraged)
Major Maintenance	• Clean out under-drains if present to alleviate ponding. Replace media if ponding or loss of infiltrative capacity persists and revegetate • Repair structural damage to flow control structures including inlet, outlet and overflow structures • De-thatch grass to remove accumulated sediment and aerate compacted areas to promote infiltration

Table 6-2: Routine Maintenance – Infiltration Facilities

Defect	**Conditions When Maintenance Is Needed**	**Results Expected When Maintenance Is Performed**	**Frequency**
Trash & Debris	Any trash and debris which exceed 5 cubic feet per 1,000 square feet (one standard garbage can). In general, there should be no visual evidence of dumping. If less than threshold, all trash and debris will be removed as part of next scheduled maintenance.	Trash and debris cleared from site.	Annually prior to wet season. After major storm events (>0.75 in/24 hrs) if spot checks indicate widespread damage/ maintenance needs. Litter removal is dependent on site conditions and desired aesthetics and should be done at a frequency to meet those objectives.
Inlet Erosion	Visible evidence of erosion occurring near inlet structures.	Eroded areas repaired/reseeded	
Visual Contaminants and Pollution	Any evidence of oil, gasoline, contaminants or other pollutants.	No contaminants or pollutants present.	
Slow Drain Time	Standing water long after storm has passed (after 48 to 72 hours), or visual inspection of wells (if available) indicates that design drain times are not being achieved.	Water drains within 48 to 72 hours. Drainage pipe is cleared, accumulated litter on surface is removed, and top 1-2" of soil is raked or replaced.	
Inlets Blocked	Trash and debris or sediment blocking inlet structures.	Inlets clear and free of trash and debris.	
Appearance of Poisonous, Noxious or Nuisance Vegetation	Excessive grass and weed growth. Noxious weeds, woody vegetation establishing, Turf growing over rock filter.	Vegetation is mowed or trimmed to restore function. Weeds are removed to prevent noxious and nuisance plants from becoming established.	Monthly (or as dictated by agreement between County and landscape contractor).

Table 6-3: Major Maintenance – Infiltration Facilities

Defect	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed	Frequency
Standing Water	Standing water long after storm has passed (after 24 to 48 hours), or visual inspection of wells (if available) indicates that design drain times are not being achieved	Design infiltration rate restored, either through excavation and filter media replacement or surface sediment removal. If applicable, underdrain cleaned, reset or replaced.	As needed

After the Storm

What is stormwater runoff?

Stormwater runoff occurs when precipitation from rain or snowmelt flows over the ground. Impervious surfaces like driveways, sidewalks, and streets prevent stormwater from naturally soaking into the ground.

Why is stormwater runoff a problem?

Stormwater can pick up debris, chemicals, dirt, and other pollutants and flow into a storm sewer system or directly to a lake, stream, river, wetland, or coastal water. Anything that enters a storm sewer system is discharged untreated into the waterbodies we use for swimming, fishing, and providing drinking water.

The effects of pollution

Polluted stormwater runoff can have many adverse effects on plants, fish, animals, and people.

- Sediment can cloud the water and make it difficult or impossible for aquatic plants to grow. Sediment also can destroy aquatic habitats.
- Excess nutrients can cause algae blooms. When algae die, they sink to the bottom and decompose in a process that removes oxygen from the water. Fish and other aquatic organisms can't exist in water with low dissolved oxygen levels.
- Bacteria and other pathogens can wash into swimming areas and create health hazards, often making beach closures necessary.
- Debris—plastic bags, six-pack rings, bottles, and cigarette butts—washed into waterbodies can choke, suffocate, or disable aquatic life like ducks, fish, turtles, and birds.
- Household hazardous wastes like insecticides, pesticides, paint, solvents, used motor oil, and other auto fluids can poison aquatic life. Land animals and people can become sick or die from eating diseased fish and shellfish or ingesting polluted water.
- Polluted stormwater often affects drinking water sources. This, in turn, can affect human health and increase drinking water treatment costs.

A Citizen's Guide to Understanding Stormwater

EPA 833-B-03-002

January 2003

United States Environmental Protection Agency

THE YEAR OF CLEAN WATER

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For more information contact:

or visit
www.epa.gov/npdes/stormwater
www.epa.gov/nps

Stormwater Pollution Solutions

Education is essential to changing people's behavior. Signs and markers near storm drains warn residents that pollutants entering the drains will be carried untreated into a local waterbody.

Residential

Recycle or properly dispose of household products that contain chemicals, such as insecticides, pesticides, paint, solvents, and used motor oil and other auto fluids. Don't pour them onto the ground or into storm drains.

Auto care

Washing your car and degreasing auto parts at home can send detergents and other contaminants through the storm sewer system. Dumping automotive fluids into storm drains has the same result as dumping the materials directly into a waterbody.

- Use a commercial car wash that treats or recycles its wastewater, or wash your car on your yard so the water infiltrates into the ground.
- Repair leaks and dispose of used auto fluids and batteries at designated drop-off or recycling locations.

Lawn care

Excess fertilizers and pesticides applied to lawns and gardens wash off and pollute streams. In addition, yard clippings and leaves can wash into storm drains and contribute nutrients and organic matter to streams.

- Don't overwater your lawn. Consider using a soaker hose instead of a sprinkler.
- Use pesticides and fertilizers sparingly. When use is necessary, use these chemicals in the recommended amounts. Use organic mulch or safer pest control methods whenever possible.
- Compost or mulch yard waste. Don't leave it in the street or sweep it into storm drains or streams.
- Cover piles of dirt or mulch being used in landscaping projects.

Septic systems

Leaking and poorly maintained septic systems release nutrients and pathogens (bacteria and viruses) that can be picked up by stormwater and discharged into nearby waterbodies. Pathogens can cause public health problems and environmental concerns.

- Inspect your system every 3 years and pump your tank as necessary (every 3 to 5 years).
- Don't dispose of household hazardous waste in sinks or toilets.

Pet waste

Pet waste can be a major source of bacteria and excess nutrients in local waters.

- When walking your pet, remember to pick up the waste and dispose of it properly. Flushing pet waste is the best disposal method. Leaving pet waste on the ground increases public health risks by allowing harmful bacteria and nutrients to wash into the storm drain and eventually into local waterbodies.

Residential landscaping

Permeable Pavement—Traditional concrete and asphalt don't allow water to soak into the ground. Instead these surfaces rely on storm drains to divert unwanted water. Permeable pavement systems allow rain and snowmelt to soak through, decreasing stormwater runoff.

Rain Barrels—You can collect rainwater from rooftops in mosquito-proof containers. The water can be used later on lawn or garden areas.

Rain Gardens and Grassy Swales—Specially designed areas planted with native plants can provide natural places for rainwater to collect and soak into the ground. Rain from rooftop areas or paved areas can be diverted into these areas rather than into storm drains.

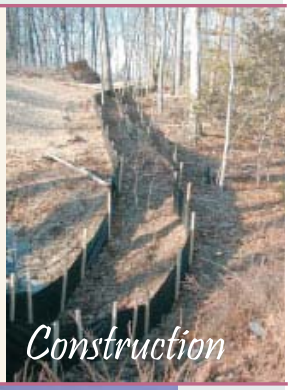
Vegetated Filter Strips—Filter strips are areas of native grass or plants created along roadways or streams. They trap the pollutants stormwater picks up as it flows across driveways and streets.

Commercial

Dirt, oil, and debris that collect in parking lots and paved areas can be washed into the storm sewer system and eventually enter local waterbodies.

- Sweep up litter and debris from sidewalks, driveways and parking lots, especially around storm drains.
- Cover grease storage and dumpsters and keep them clean to avoid leaks.
- Report any chemical spill to the local hazardous waste cleanup team. They'll know the best way to keep spills from harming the environment.

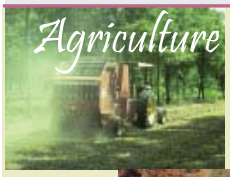
Construction



Erosion controls that aren't maintained can cause excessive amounts of sediment and debris to be carried into the stormwater system. Construction vehicles can leak fuel, oil, and other harmful fluids that can be picked up by stormwater and deposited into local waterbodies.

- Divert stormwater away from disturbed or exposed areas of the construction site.
- Install silt fences, vehicle mud removal areas, vegetative cover, and other sediment and erosion controls and properly maintain them, especially after rainstorms.
- Prevent soil erosion by minimizing disturbed areas during construction projects, and seed and mulch bare areas as soon as possible.

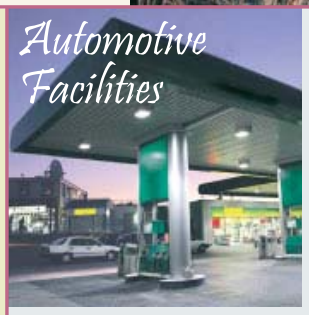
Agriculture



Lack of vegetation on streambanks can lead to erosion. Overgrazed pastures can also contribute excessive amounts of sediment to local waterbodies. Excess fertilizers and pesticides can poison aquatic animals and lead to destructive algae blooms. Livestock in streams can contaminate waterways with bacteria, making them unsafe for human contact.

- Keep livestock away from streambanks and provide them a water source away from waterbodies.
- Store and apply manure away from waterbodies and in accordance with a nutrient management plan.
- Vegetate riparian areas along waterways.
- Rotate animal grazing to prevent soil erosion in fields.
- Apply fertilizers and pesticides according to label instructions to save money and minimize pollution.

Automotive Facilities



Uncovered fueling stations allow spills to be washed into storm drains. Cars waiting to be repaired can leak fuel, oil, and other harmful fluids that can be picked up by stormwater.

- Clean up spills immediately and properly dispose of cleanup materials.
- Provide cover over fueling stations and design or retrofit facilities for spill containment.
- Properly maintain fleet vehicles to prevent oil, gas, and other discharges from being washed into local waterbodies.
- Install and maintain oil/water separators.

Forestry

Improperly managed logging operations can result in erosion and sedimentation.

- Conduct preharvest planning to prevent erosion and lower costs.
- Use logging methods and equipment that minimize soil disturbance.
- Plan and design skid trails, yard areas, and truck access roads to minimize stream crossings and avoid disturbing the forest floor.
- Construct stream crossings so that they minimize erosion and physical changes to streams.
- Expedite revegetation of cleared areas.

RIVERSIDE COUNTY
ANIMAL SERVICES LOCATIONS:

www.rcdas.org

BLYTHE
16450 West Hobson Way
Blythe, CA 92225
760-921-7857

COACHELLA VALLEY ANIMAL CAMPUS
72-050 Petland Place
Thousand Palms, CA 92276
760-343-3644

RIVERSIDE COUNTY ANIMAL SERVICES
6851 Van Buren Blvd.
Riverside, CA 92509
951-688-4340

OTHER ANIMAL SHELTERS:

ANIMAL CARE CENTER OF INDIO
45-355 Van Buren
Indio, CA 92201
760-391-4138

ANIMAL FRIENDS OF THE VALLEYS
29001 Bastron Avenue
Lake Elsinore, CA 92530
951-674-0618
(Serving incorporated Temecula, Wildomar, Lake Elsinore, Murrieta and Canyon Lake)

MARY S. ROBERTS PET ADOPTION CENTER
6185 Industrial Avenue
Riverside, CA 92504
951-688-4340

RAMONA HUMANE SOCIETY
690 Humane Way
San Jacinto 92586
951-654-8002
(Serving Sun City, Menifee, Romoland and Homeland)

Looking to adopt a pet?
This website is linked to many animal shelters.
www.petfinder.com

To report illegal storm drain disposal, call
1-800-506-2555

Or visit our website at www.rcflood.org

E-mail fcnpdes@rcflood.org

What's the Scoop?

Tips for a Healthy Pet and a Healthier Environment

CREATE A HEALTHY ENVIRONMENT in and around your home by following these simple pet practices. Your pet, family and neighbors will appreciate their clean comfortable surroundings.

HOUSEHOLD PETS

We all love our pets, but pet waste is a subject everyone likes to avoid. Pet waste left on trails, sidewalks, streets and grassy areas can be washed into the nearest waterway when it rains. Even if you can't see streams or lakes near you, rainfall (stormwater) or sprinkler runoff can wash pet waste into the storm drains that carry runoff to the nearest streams or lakes untreated. The risk of stormwater contamination increases if pet waste is allowed to accumulate in outdoor animal pen areas or left on sidewalks, streets or driveways.

Pet waste contains nutrients and bacteria. Nutrients can promote the growth of algae in streams and lakes. Algae can cause fish kills and other environmental damage if it is fed too many nutrients. Pet Waste also contains e. Coli and fecal bacteria, which can cause disease in other animals and humans that come in contact with it when swimming or splashing in streams and lakes. Dogs also carry salmonella and giardia, which can make people sick.

Pet waste that is not picked up and properly disposed can also increase vector problems. Flies and other insects are not only attracted to and feed on pet waste, but can also be infected with diseases and spread those diseases to humans and other animals.

WHAT CAN YOU DO?

- SCOOP up pet waste and flush it down the toilet or place in trash can.
- NEVER DUMP pet waste into a storm drain or catch basin.
- USE the complimentary bags or mutt mitts offered in dispensers at local parks.
- CARRY EXTRA BAGS when walking your dog and make them available to other pet owners who are without.
- TEACH CHILDREN how to properly clean up after a pet.
- TELL FRIENDS AND NEIGHBORS about the ill effects of animal waste on the environment. Encourage them to clean up after pets.

Call 1-800-506-2555 TOLL FREE to report illegal dumping to the storm drain, find the dates and times of local Household Hazardous Waste Collection Events, obtain additional information on stormwater problems and solutions, request presentations about stormwater pollution in your child's classroom, or learn about free grasscycling and composting workshops.

SCOOP THE POOP

Many communities have "Scoop the Poop" laws that govern pet waste cleanup. Some of these laws specifically require anyone who walks an animal off their property to carry a bag, shovel, or scooper. Any waste left by the animal must be cleaned up immediately. CALL YOUR LOCAL CODE ENFORCEMENT OFFICE to find out more about pet waste regulations.

OTHER WAYS TO PROTECT YOUR PETS AND THE ENVIRONMENT

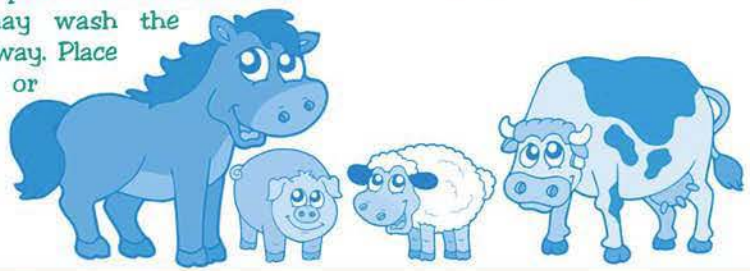
Pets are only one of many sources that contribute to water pollution. However, these other sources of water pollution cannot only harm the environment but also harm your pet. Improperly used or stored lawn fertilizers, pesticides, soaps, grease and vehicle fluids cannot only be washed into local streams and lakes, these chemicals can also harm your pet if they ingest or touch these chemicals. Call 1-800-506-2555 for information regarding how to properly dispose of household hazardous wastes such as these. You can also keep your pets and our environment healthy by properly maintaining your vehicles, and limiting use of pesticides and fertilizers to only the amount that is absolutely needed.

Make sure to not only protect your pets, but to also protect your neighbors pets. NEVER HOSE VEHICLE FLUIDS into the street or gutter. USE ABSORBENT MATERIALS such as cat litter to clean-up spills. SWEEP UP used absorbent materials and place it in the trash.

HORSES AND LIVESTOCK

Fortunate enough to own a horse or livestock? You, too, can play a part in protecting and cleaning up our water resources. The following are a few simple Best Management Practices (BMPs) specifically designed for horses and livestock.

- STORE your manure properly. Do not store unprotected piles of manure in places where stormwater runoff may wash the manure away. Place a cover or tarp over the pile to keep rainwater out.



- BUILD a manure storage facility to protect your pets, property and the environment. These structures usually consist of a concrete pad to protect groundwater and a short wall on one or two sides to make manure handling easier.
- READ the Only Rain Down the Storm Drain brochure titled "Tips for Horse Care" for additional guidance and recommendations. This brochure should be available from your local city office or for download at www.rcflood.org/stormwater.
- KEEP animals out of streams - Horses and livestock can deficate in streams causing stormwater pollution. Livestock and horses in streams can also disturb sensitive habitat and vegetation, causing additional environmental damage. Keep livestock and horses away from streams and use designated stream crossings whenever possible.
- MATERIAL STORAGE SAFETY TIPS Many of the chemicals found in barns require careful handling and proper disposal. When using these chemicals, be certain to follow these common sense guidelines:
  - Buy only what you need.
  - Treat spills of hoof oils like a fuel spill. Use kitty litter to soak up the oil and dispose of it in a tightly sealed plastic bag.
  - Store pesticides in a locked, dry, well-ventilated area.
  - Protect stored fertilizer and pesticides from rain and surface water.

RESOURCE CONSERVATION DISTRICTS CAN HELP

Call 1-800-506-2555 for assistance with locating a local conservation district that can help you properly manage your manure, re-establish healthy pastures, control weeds, or identify appropriate grasses for your soils.

Thank you for doing your part to protect your watershed, the environment, your pets and your community!

Landscaping and garden maintenance activities can be major contributors to water pollution. Soils, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!

In Riverside County, report illegal discharges into the storm drain, call
1-800-506-2555
"Only Rain Down the Storm Drain"

Important Links:

Riverside County Household Hazardous Waste Collection Information
1-800-304-2226 or www.rivcowm.org

Riverside County Backyard Composting Program
1-800-366-SAVE

Integrated Pest Management (IPM) Solutions
www.ipm.ucdavis.edu

California Master Gardener Programs
www.mastergardeners.org
www.camastergardeners.ucdavis.edu

California Native Plant Society
www.cnps.org

The Riverside County "Only Rain Down the Storm Drain" Pollution Prevention Program gratefully acknowledges Orange County's Storm Water Program for their contribution to this brochure.

...Only Rain Down ...the Storm Drain

What you should know for... Landscape and Gardening

Best Management tips for:

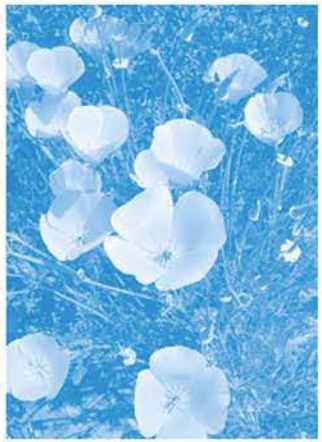
- Professionals
- Novices
- Landscapers
- Gardeners
- Cultivators

Tips for Landscape & Gardening

This brochure will help you to get the most of your lawn and gardening efforts and keep our waterways clean. Clean waterways provide recreation, establish thriving fish habitats, secure safe sanctuaries for wildlife, and add beauty to our communities. NEVER allow gardening products or waste water to enter the street, gutter or storm drain.

General Landscaping Tips

- Protect stockpiles and materials from wind and rain by storing them under tarps or secured plastic sheeting.
- Prevent erosion of slopes by planting fast-growing, dense ground covering plants. These will shield and bind the soil.



- Plant native vegetation to reduce the amount of water, fertilizers and pesticides applied to the landscape.
- Never apply pesticides or fertilizers when rain is predicted within the next 48 hours.

Garden & Lawn Maintenance

- Do not overwater. Use irrigation practices such as drip irrigation, soaker hoses or micro-spray systems. Periodically inspect and fix leaks and misdirected sprinklers.
- Do not rake or blow leaves, clippings or pruning waste into the street, gutter or storm drain. Instead, dispose of green waste by composting, hauling it to a permitted landfill, or recycling it through your city's program.

- Consider recycling your green waste and adding "nature's own fertilizer" to your lawn or garden.
- Read labels and use only as directed. Do not over-apply pesticides or fertilizers. Apply to spots as needed, rather than blanketing an entire area.
- Store pesticides, fertilizers and other chemicals in a dry covered area to prevent exposure that may result in the deterioration of containers and packaging.
- Rinse empty pesticide containers and re-use rinse water as you would use the product. Do not dump rinse water down storm drains or sewers. Dispose of empty containers in the trash.
- When available, use non-toxic alternatives to traditional pesticides, and use pesticides specifically designed to control the pest you are targeting.
- Try natural long-term common sense solutions first. Integrated Pest Management (IPM) can provide landscaping guidance and solutions, such as:
  - **Physical Controls** - Try hand picking, barriers, traps or caulking holes to control weeds and pests.
  - **Biological Controls** - Use predatory insects to control harmful pests.
  - **Chemical Controls** - Check out www.ipm.ucdavis.edu before using chemicals. Remember, all chemicals should be used cautiously and in moderation.
- If fertilizer is spilled, sweep up the spill before irrigating. If the spill is liquid, apply an absorbent material such as cat litter, and then sweep it up and dispose of it in the trash.
- Take unwanted pesticides to a Household Waste Collection Center to be recycled.
- *Dumping toxics into the street, gutter or storm drain is illegal!*

www.bewaterwise.com Great water conservation tips and drought tolerant garden designs.

www.ourwaterourworld.com Learn how to safely manage home and garden pests.

Additional information can also be found on the back of this brochure.

Helpful telephone numbers and links:

Riverside County Stormwater Protection Partners

Flood Control District	(951) 955-1200
County of Riverside	(951) 955-1000
City of Banning	(951) 922-3105
City of Beaumont	(951) 769-8520
City of Calimesa	(909) 795-9801
City of Canyon Lake	(951) 244-2955
Cathedral City	(760) 770-0327
City of Coachella	(760) 398-4978
City of Corona	(951) 736-2447
City of Desert Hot Springs	(760) 329-6411
City of Eastvale	(951) 361-0900
City of Hemet	(951) 765-2300
City of Indian Wells	(760) 346-2489
City of Indio	(760) 391-4000
City of Lake Elsinore	(951) 674-3124
City of La Quinta	(760) 777-7000
City of Menifee	(951) 672-6777
City of Moreno Valley	(951) 413-3000
City of Murrieta	(951) 304-2489
City of Norco	(951) 270-5607
City of Palm Desert	(760) 346-0611
City of Palm Springs	(760) 323-8299
City of Perris	(951) 943-6100
City of Rancho Mirage	(760) 324-4511
City of Riverside	(951) 361-0900
City of San Jacinto	(951) 654-7337
City of Temecula	(951) 694-6444
City of Wildomar	(951) 677-7751

REPORT ILLEGAL STORM DRAIN DISPOSAL
1-800-506-2555 or e-mail us at
fcnpdes@rcflood.org

- Riverside County Flood Control and Water Conservation District
  www.rcflood.org

Online resources include:

- California Storm Water Quality Association
  www.casqa.org
- State Water Resources Control Board
  www.waterboards.ca.gov
- Power Washers of North America
  www.thepwna.org

Stormwater Pollution

What you should know for...

Outdoor Cleaning Activities and Professional Mobile Service Providers

Storm drain pollution prevention information for:

- Car Washing / Mobile Detailers
- Window and Carpet Cleaners
- Power Washers
- Waterproofers / Street Sweepers
- Equipment cleaners or degreasers and all mobile service providers

Do you know where street flows actually go?

Storm drains are NOT connected to sanitary sewer systems and treatment plants!

The primary purpose of storm drains is to carry *rain* water away from developed areas to prevent flooding. Pollutants discharged to storm drains are transported directly into rivers, lakes and streams. Soaps, degreasers, automotive fluids, litter and a host of materials are washed off buildings, sidewalks, plazas and parking areas. Vehicles and equipment must be properly managed to prevent the pollution of local waterways.

Unintentional spills by mobile service operators can flow into storm drains and pollute our waterways. **Avoid mishaps.** *Always* have a **Spill Response Kit** on hand to clean up unintentional spills. Only emergency **Mechanical** repairs should be done in City streets, using drip pans for spills. **Plumbing** should be done on private property. Always store chemicals in a leak-proof container and keep covered when not in use. **Window/Power Washing** waste water shouldn't be released into the streets, but should be disposed of in a sanitary sewer, landscaped area or in the soil. Soiled **Carpet Cleaning** wash water should be filtered before being discharged into the sanitary sewer. Dispose of all filter debris properly. **Car Washing/Detailing** operators should wash cars on private property and use a regulated hose nozzle for water flow control and runoff prevention. Capture and dispose of waste water and chemicals properly. Remember, storm drains are for receiving rain water runoff only.

REPORT ILLEGAL STORM DRAIN DISPOSAL 1-800-506-2555

Help Protect Our Waterways!

Use these guidelines for Outdoor Cleaning Activities and Wash Water Disposal

Did you know that disposing of pollutants into the street, gutter, storm drain or body of water is *PROHIBITED* by law and can result in stiff penalties?

Best Management Practices

Waste wash water from Mechanics, Plumbers, Window/Power Washers, Carpet Cleaners, Car Washing and Mobile Detailing activities may contain significant quantities of motor oil, grease, chemicals, dirt, detergents, brake pad dust, litter and other materials.

Best Management Practices, or BMPs as they are known, are guides to prevent pollutants from entering the storm drains. ***Each of us*** can do our part to keep stormwater clean by using the suggested BMPs below:

Simple solutions for both light and heavy duty jobs:

Do...consider dry cleaning methods first such as a mop, broom, rag or wire brush. Always keep a spill response kit on site.

Do...prepare the work area before power cleaning by using sand bags, rubber mats, vacuum booms, containment pads or temporary berms to keep wash water away from the gutters and storm drains.

Do...use vacuums or other machines to remove and collect loose debris or litter before applying water.

Do...obtain the property owner's permission to dispose of ***small amounts*** of power washing waste water on to landscaped, gravel or unpaved surfaces.

Do...check your local sanitary sewer agency's policies on wash water disposal regulations before disposing of wash water into the sewer. (See list on reverse side)

Do...be aware that if discharging to landscape areas, soapy wash water may damage landscaping. Residual wash water may remain on paved surfaces to evaporate. Sweep up solid residuals and dispose of properly. Vacuum booms are another option for capturing and collecting wash water.

Do...check to see if local ordinances prevent certain activities.

Do not let...wash or waste water from sidewalk, plaza or building cleaning go into a street or storm drain.

Report illegal storm drain disposal
Call Toll Free
1-800-506-2555

Using Cleaning Agents

Try using biodegradable/phosphate-free products. They are easier on the environment, but don't confuse them with being toxic free. Soapy water entering the storm drain system can impact the delicate aquatic environment.

When cleaning surfaces with a ***high-pressure washer*** or ***steam cleaner***, additional precautions should be taken to prevent the discharge of pollutants into the storm drain system. These two methods of surface cleaning can loosen additional material that can contaminate local waterways.

Think Water Conservation

Minimize water use by using high pressure, low volume nozzles. Be sure to check all hoses for leaks. Water is a precious resource, don't let it flow freely and be sure to shut it off in between uses.

Screening Wash Water

Conduct thorough dry cleanup before washing exterior surfaces, such as buildings and decks ***with loose paint***, sidewalks or plaza areas. Keep debris from entering the storm drain after cleaning by first passing the wash water through a "20 mesh" or finer screen to catch the solid materials, then dispose of the mesh in a refuse container. Do not let the remaining wash water enter a street, gutter or storm drain.

Drain Inlet Protection & Collection of Wash Water

- Prior to any washing, block all storm drains with an impervious barrier such as sandbags or berms, or seal the storm drain with plugs or other appropriate materials.
- Create a containment area with berms and traps or take advantage of a low spot to keep wash water contained.
- Wash vehicles and equipment on grassy or gravel areas so that the wash water can seep into the ground.
- Pump or vacuum up all wash water in the contained area.

Concrete/Coring/Saw Cutting and Drilling Projects

Protect any down-gradient inlets by using dry activity techniques whenever possible. If water is used, minimize the amount of water used during the coring/drilling or saw cutting process. Place a barrier of sandbags and/or absorbent berms to protect the storm drain inlet or watercourse. Use a shovel or wet vacuum to remove the residue from the pavement. Do not wash residue or particulate matter into a storm drain inlet or watercourse.

Saltwater Pools

- Salt water pools, although different from regular pools, are in fact, sanitized using chlorine. A salt-chlorine generator separates the chlorine and sodium molecules in salt and reintroduces them into the pool water. The same harmful effects of chlorine still apply.
- A salt water pool is still maintained with chemicals such as Muriatic acid, soda ash and sodium carbonate to help keep a proper pH, total Alkalinity, Calcium Hardness and Stabilizer levels.

- It may be illegal to discharge salt water to land. The salt may kill plants and the build-up of salt in soil puts animals, plants, and groundwater at risk. Consult your city representatives to determine local requirements regarding salt water drainage.

NEVER put unused chemicals into the trash, onto the ground or down a storm drain.

IMPORTANT: The discharge of pollutants into the street, gutter, storm drain system or waterways - without a permit or waiver - is strictly prohibited by local ordinances, state and federal law. Violations may result in monetary fines and enforcement actions.

Helpful telephone numbers and links

Riverside County Water Agencies:

City of Banning	(951) 922-3130
City of Beaumont/Cherry Valley	(951) 845-9581
City of Blythe	(760) 922-6161
City of Coachella	(760) 398-3502
City of Corona	(951) 736-2263
City of Hemet	(951) 765-3710
City of Norco	(951) 270 5607
City of Riverside Public Works	(951) 351-6140
City of San Jacinto	(951) 654-4041
Coachella Valley Water District	(760) 398-2651
Desert Water Agency (Palm Springs)	(760) 323-4971
Eastern Municipal Water District	(951) 928-3777
Elsinore Valley Municipal Water District	(951) 674 3146
Elsinore Water District	(951) 674-2168
Farm Mutual Water Company	(951) 244-4198
Idyllwild Water District	(951) 659-2143
Indio Water Authority	(760) 391-4129
Jurupa Community Services District	(951) 685-7434
Lee Lake Water	(951) 658-3241
Mission Springs Water	(760) 329-6448
Rancho California Water District	(951) 296-6900
Ripley, CSA #62	(760) 922-4951
Riverside Co. Service Area #51	(760) 227-3203
Rubidoux Community Services District	(951) 684-7580
Valley Sanitary District	(760) 347-2356
Western Municipal Water District	(951) 789-5000
Yucaipa Valley Water District	(909) 797-5117

CALL 1-800-506-2555 to:

- Report clogged storm drains or illegal storm drain disposal from residential, industrial, construction and commercial sites into public streets, storm drains and/or water bodies.
- Find out about our various storm drain pollution prevention materials.
- Locate the dates and times of Household Hazardous Waste (HHW) Collection Events.
- Request adult, neighborhood, or classroom presentations.
- Locate other County environmental services.
- Receive grasscycling information and composting workshop information.

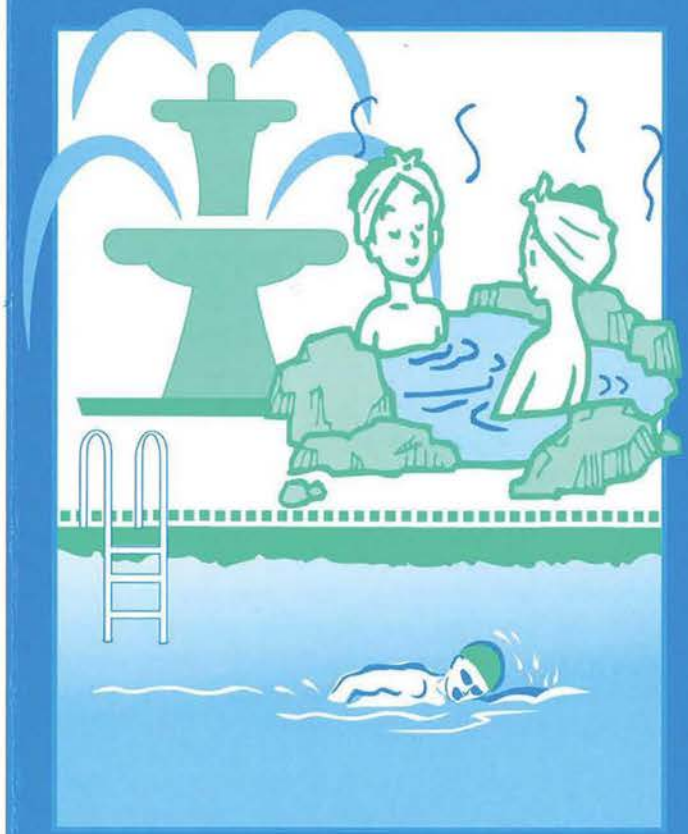
Or visit our
Riverside County Flood Control and Water Conservation District
website at: www.rcflood.org

Other links to additional storm drain pollution information:

- County of Riverside Environmental Health: www.rivcoeh.org
- State Water Resources Control Board: www.waterboards.ca.gov
- California Stormwater Quality Association: www.casqa.org
- United States Environmental Protection Agency (EPA): www.epa.gov/compliance/assistance (compliance assistance information)

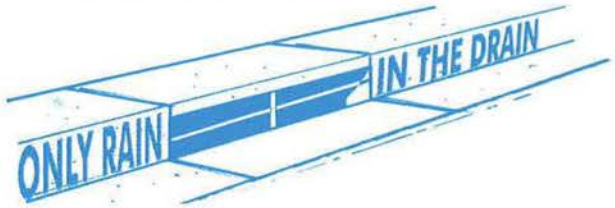
Riverside County's, "Only Rain Down the Storm Drain" Pollution Prevention Program gratefully acknowledges the Bay Area Stormwater Management Agencies Association and the Cleaning Equipment Trade Association for information provided in this brochure.

Guidelines for Maintaining your...



Swimming Pool, Jacuzzi and Garden Fountain

Where does the water go?



Pool, Jacuzzi and Fountain wastewater and rain water runoff (also called stormwater) that reach streets can enter the storm drain and be conveyed directly into local streams, rivers and lakes.

A storm drain's purpose is to prevent flooding by carrying rain water away from developed areas. Storm drains are not connected to sanitary sewers systems and treatment plants!

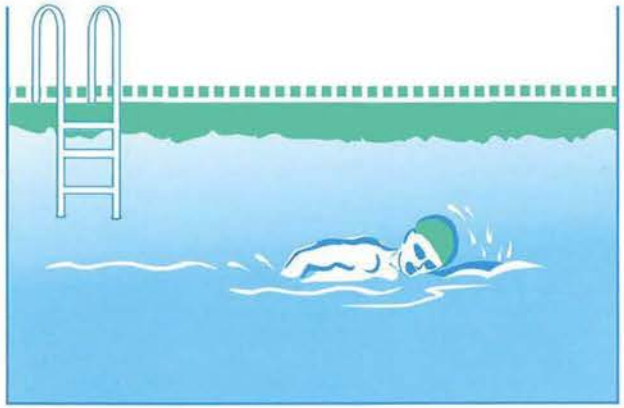
Wastewater, from residential swimming pools, Jacuzzis, fishponds and fountains, often contains chemicals used for sanitizing or cleansing purposes. Toxic chemicals (such as chlorine or copper-based algaecides) may pollute the environment when discharged into a storm drain system.

The Cities and County of Riverside have adopted ordinances that prohibit the discharge of wastewater to the street and storm drain system.

Discharge Regulations

Regulatory requirements for discharging wastewater from your pool may differ from city to city. Chlorinated water should not be discharged into the street, storm drain or surface waters. Check with your water agency to see if disposal to the sanitary sewer line is allowed for pool discharges (see reverse for Riverside County sewer agencies).

If allowed, a hose can be run from the pool Jacuzzi, or fountain to the private sewer cleanout, washing machine drain or a sink or bathtub.



If you cannot discharge to the sewer, you may drain your fountain, pool, or jacuzzi to your landscaping by following these guidelines:

First, reduce or eliminate solids (e.g. debris, leaves or dirt) in the pool water and allow the chemicals in the pool water to dissipate before draining the pool (this could take up to 7 days, verify using a home pool test kit).

Second, slowly drain to a landscaped area away from buildings or structures. Control the flow to prevent soil erosion; it may take more than one day to empty. Do not allow sediment to enter the street, gutter or storm drain.

Maintenance & Chemicals

Cleaning Filters

Filter rinse water and backwash must be discharged to the sanitary sewer, on-site septic tank and drain field system (if properly designed and adequately sized), or a seepage pit. Alternatively, rinse water or backwash may be diverted to landscaped or dirt areas. Filter media and other non-hazardous solids should be picked up and disposed of in the trash.

Algaecides

Avoid using copper-based algaecides unless absolutely necessary. Control algae with chlorine, organic polymers or other alternatives to copper-based pool chemicals. Copper is a heavy metal that can be toxic to aquatic life when you drain your pool.

Chemical Storage and Handling

- Use only the amount indicated on product labels
- Store chlorine and other chemicals in a covered area to prevent runoff. Keep out of reach of children and pets.
- Chlorine kits, available at retail swimming pool equipment and supply stores, should be used to monitor the chlorine and pH levels before draining your pool.
- Chlorine and other pool chemicals should never be allowed to flow into the gutter or storm drain system.

Take unwanted chemicals to a Household Hazardous Waste (HHW) Collection Event. There's no cost for taking HHW items to collection events – it's FREE! Call **1-800-506-2555** for a schedule of HHW events in your community.

Stormwater Pollution Found in Your Area!

This is not a citation.

This is to inform you that our staff found the following pollutants in the storm sewer system in your area. This storm sewer system leads directly to

_____ .

- ❑ Motor oil
- ❑ Oil filters
- ❑ Antifreeze/ transmission fluid
- ❑ Paint
- ❑ Solvent/degreaser
- ❑ Cooking grease
- ❑ Detergent
- ❑ Home improvement waste (concrete, mortar)
- ❑ Pet waste
- ❑ Yard waste (leaves, grass, mulch)
- ❑ Excessive dirt and gravel
- ❑ Trash
- ❑ Construction debris
- ❑ Pesticides and fertilizers
- ❑ Other

_____

For more information or to report an illegal discharge of pollutants, please call:

Riverside County Residents, Call . . .
1-800-506-2555

EPA
United States
Environmental Protection
Agency

www.epa.gov/npdes/stormwater

EPA 833-F-03-002
April 2003

Stormwater runoff is precipitation from rain or snowmelt that flows over the ground. As it flows, it can pick up debris, chemicals, dirt, and other pollutants and deposit them into a storm sewer system or waterbody.

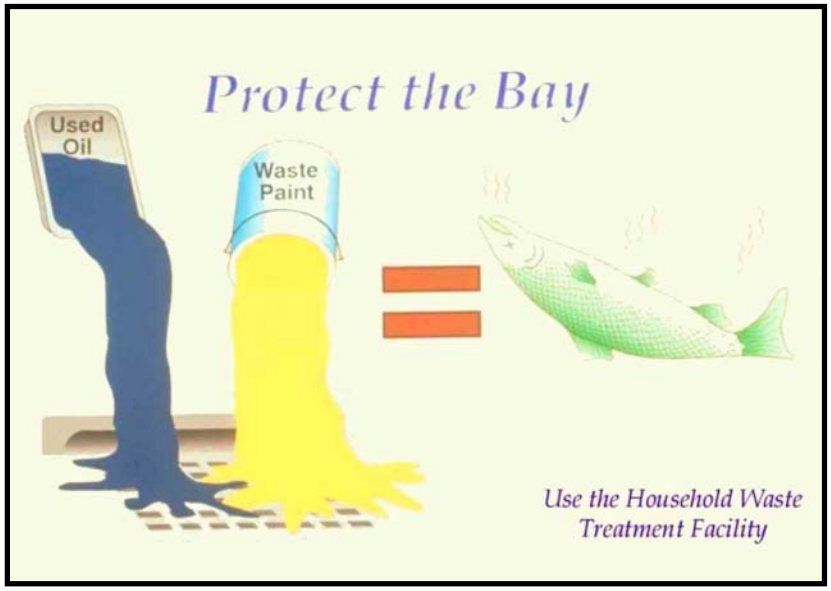
Anything that enters a storm sewer system is discharged untreated into the waterbodies we use for swimming, fishing, and providing drinking water.

Remember: Only Rain Down the Drain

To keep the stormwater leaving your home or workplace clean, follow these simple guidelines:

- Use pesticides and fertilizers sparingly.
- Repair auto leaks.
- Dispose of household hazardous waste, used auto fluids (antifreeze, oil, etc.), and batteries at designated collection or recycling locations.
- Clean up after your pet.
- Use a commercial car wash or wash your car on a lawn or other unpaved surface.
- Sweep up yard debris rather than hosing down areas. Compost or recycle yard waste when possible.
- Clean paint brushes in a sink, not outdoors. Properly dispose of excess paints through a household hazardous waste collection program.
- Sweep up and properly dispose of construction debris like concrete and mortar.

Non-Stormwater Discharges SC-10



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

Non-stormwater discharges are those flows that do not consist entirely of stormwater. Some non-stormwater discharges do not include pollutants and may be discharged to the storm drain. These include uncontaminated groundwater and natural springs. There are also some non-stormwater discharges that typically do not contain pollutants and may be discharged to the storm drain with conditions. These include car washing, air conditioner condensate, etc. However there are certain non-stormwater discharges that pose environmental concern. These discharges may originate from illegal dumping or from internal floor drains, appliances, industrial processes, sinks, and toilets that are connected to the nearby storm drainage system. These discharges (which may include: process waste waters, cooling waters, wash waters, and sanitary wastewater) can carry substances such as paint, oil, fuel and other automotive fluids, chemicals and other pollutants into storm drains. They can generally be detected through a combination of detection and elimination. The ultimate goal is to effectively eliminate non-stormwater discharges to the stormwater drainage system through implementation of measures to detect, correct, and enforce against illicit connections and illegal discharges of pollutants on streets and into the storm drain system and creeks.

Targeted Constituents

Sediment	
Nutrients	✓
Trash	
Metals	✓
Bacteria	✓
Oil and Grease	✓
Organics	✓

Approach

Initially the industry must make an assessment of non-stormwater discharges to determine which types must be eliminated or addressed through BMPs. The focus of the following approach is in the elimination of non-stormwater discharges.

CASQA California Stormwater Quality Association

Pollution Prevention

- Ensure that used oil, used antifreeze, and hazardous chemical recycling programs are being implemented. Encourage litter control.

Suggested Protocols

Recommended Complaint Investigation Equipment

- Field Screening Analysis
  - pH paper or meter
  - Commercial stormwater pollutant screening kit that can detect for reactive phosphorus, nitrate nitrogen, ammonium nitrogen, specific conductance, and turbidity
  - Sample jars
  - Sample collection pole
  - A tool to remove access hole covers
- Laboratory Analysis
  - Sample cooler
  - Ice
  - Sample jars and labels
  - Chain of custody forms
- Documentation
  - Camera
  - Notebook
  - Pens
  - Notice of Violation forms
  - Educational materials

General

- Develop clear protocols and lines of communication for effectively prohibiting non-stormwater discharges, especially those that are not classified as hazardous. These are often not responded to as effectively as they need to be.
- Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as “Dump No Waste Drains to Stream” stenciled or demarcated next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.

- See SC44 Stormwater Drainage System Maintenance for additional information.

Illicit Connections

- Locate discharges from the industrial storm drainage system to the municipal storm drain system through review of "as-built" piping schematics.
- Isolate problem areas and plug illicit discharge points.
- Locate and evaluate all discharges to the industrial storm drain system.

Visual Inspection and Inventory

- Inventory and inspect each discharge point during dry weather.
- Keep in mind that drainage from a storm event can continue for a day or two following the end of a storm and groundwater may infiltrate the underground stormwater collection system. Also, non-stormwater discharges are often intermittent and may require periodic inspections.

Review Infield Piping

- A review of the "as-built" piping schematic is a way to determine if there are any connections to the stormwater collection system.
- Inspect the path of floor drains in older buildings.

Smoke Testing

- Smoke testing of wastewater and stormwater collection systems is used to detect connections between the two systems.
- During dry weather the stormwater collection system is filled with smoke and then traced to sources. The appearance of smoke at the base of a toilet indicates that there may be a connection between the sanitary and the stormwater system.

Dye Testing

- A dye test can be performed by simply releasing a dye into either your sanitary or process wastewater system and examining the discharge points from the stormwater collection system for discoloration.

TV Inspection of Drainage System

- TV Cameras can be employed to visually identify illicit connections to the industrial storm drainage system.

Illegal Dumping

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- On paved surfaces, clean up spills with as little water as possible. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste.

- Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
- Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.
- For larger spills, a private spill cleanup company or Hazmat team may be necessary.

Once a site has been cleaned:

- Post "No Dumping" signs with a phone number for reporting dumping and disposal.
- Landscaping and beautification efforts of hot spots may also discourage future dumping, as well as provide open space and increase property values.
- Lighting or barriers may also be needed to discourage future dumping.
- See fact sheet SC11 Spill Prevention, Control, and Cleanup.

Inspection

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- Conduct field investigations of the industrial storm drain system for potential sources of non-stormwater discharges.
- Pro-actively conduct investigations of high priority areas. Based on historical data, prioritize specific geographic areas and/or incident type for pro-active investigations.

Reporting

- A database is useful for defining and tracking the magnitude and location of the problem.
- Report prohibited non-stormwater discharges observed during the course of normal daily activities so they can be investigated, contained, and cleaned up or eliminated.
- Document that non-stormwater discharges have been eliminated by recording tests performed, methods used, dates of testing, and any on-site drainage points observed.
- Document and report annually the results of the program.
- Maintain documentation of illicit connection and illegal dumping incidents, including significant conditionally exempt discharges that are not properly managed.

Training

- Training of technical staff in identifying and documenting illegal dumping incidents is required.
- Consider posting the quick reference table near storm drains to reinforce training.
- Train employees to identify non-stormwater discharges and report discharges to the appropriate departments.

- Educate employees about spill prevention and cleanup.
- Well-trained employees can reduce human errors that lead to accidental releases or spills. The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur. Employees should be familiar with the Spill Prevention Control and Countermeasure Plan.
- Determine and implement appropriate outreach efforts to reduce non-permissible non-stormwater discharges.
- Conduct spill response drills annually (if no events occurred to evaluate your plan) in cooperation with other industries.
- When a responsible party is identified, educate the party on the impacts of his or her actions.

Spill Response and Prevention

- See SC11 Spill Prevention Control and Cleanup.

Other Considerations

- Many facilities do not have accurate, up-to-date schematic drawings.

Requirements

Costs (including capital and operation & maintenance)

- The primary cost is for staff time and depends on how aggressively a program is implemented.
- Cost for containment and disposal is borne by the discharger.
- Illicit connections can be difficult to locate especially if there is groundwater infiltration.
- Indoor floor drains may require re-plumbing if cross-connections to storm drains are detected.

Maintenance (including administrative and staffing)

- Illegal dumping and illicit connection violations requires technical staff to detect and investigate them.

Supplemental Information

Further Detail of the BMP

Illegal Dumping

- Substances illegally dumped on streets and into the storm drain systems and creeks include paints, used oil and other automotive fluids, construction debris, chemicals, fresh concrete, leaves, grass clippings, and pet wastes. All of these wastes cause stormwater and receiving water quality problems as well as clog the storm drain system itself.
- Establish a system for tracking incidents. The system should be designed to identify the following:
  - Illegal dumping hot spots

- Types and quantities (in some cases) of wastes
- Patterns in time of occurrence (time of day/night, month, or year)
- Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
- Responsible parties

One of the keys to success of reducing or eliminating illegal dumping is increasing the number of people at the facility who are aware of the problem and who have the tools to at least identify the incident, if not correct it. Therefore, train field staff to recognize and report the incidents.

What constitutes a "non-stormwater" discharge?

- Non-stormwater discharges to the stormwater collection system may include any water used directly in the manufacturing process (process wastewater), air conditioning condensate and coolant, non-contact cooling water, cooling equipment condensate, outdoor secondary containment water, vehicle and equipment wash water, sink and drinking fountain wastewater, sanitary wastes, or other wastewaters.

Permit Requirements

- Facilities subject to stormwater permit requirements must include a certification that the stormwater collection system has been tested or evaluated for the presence of non-stormwater discharges. The State's General Industrial Stormwater Permit requires that non-stormwater discharges be eliminated prior to implementation of the facility's SWPPP.

Performance Evaluation

- Review annually internal investigation results; assess whether goals were met and what changes or improvements are necessary.
- Obtain feedback from personnel assigned to respond to, or inspect for, illicit connections and illegal dumping incidents.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Spill Prevention, Control & Cleanup SC-11

Photo Credit: Geoff Brosseau

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

Many activities that occur at an industrial or commercial site have the potential to cause accidental or illegal spills. Preparation for accidental or illegal spills, with proper training and reporting systems implemented, can minimize the discharge of pollutants to the environment.

Spills and leaks are one of the largest contributors of stormwater pollutants. Spill prevention and control plans are applicable to any site at which hazardous materials are stored or used. An effective plan should have spill prevention and response procedures that identify potential spill areas, specify material handling procedures, describe spill response procedures, and provide spill clean-up equipment. The plan should take steps to identify and characterize potential spills, eliminate and reduce spill potential, respond to spills when they occur in an effort to prevent pollutants from entering the stormwater drainage system, and train personnel to prevent and control future spills.

Targeted Constituents

Sediment	
Nutrients	
Trash	
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Approach

Pollution Prevention

- Develop procedures to prevent/mitigate spills to storm drain systems. Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.

- Develop a Spill Prevention Control and Countermeasure (SPCC) Plan. The plan should include:

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- Description of the facility, owner and address, activities and chemicals present
- Facility map
- Notification and evacuation procedures
- Cleanup instructions
- Identification of responsible departments
- Identify key spill response personnel

- Recycle, reclaim, or reuse materials whenever possible. This will reduce the amount of process materials that are brought into the facility.

Suggested Protocols (including equipment needs)

Spill Prevention

- Develop procedures to prevent/mitigate spills to storm drain systems. Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.

- If consistent illegal dumping is observed at the facility:
  - Post "No Dumping" signs with a phone number for reporting illegal dumping and disposal. Signs should also indicate fines and penalties applicable for illegal dumping.
  - Landscaping and beautification efforts may also discourage illegal dumping.
  - Bright lighting and/or entrance barriers may also be needed to discourage illegal dumping.

- Store and contain liquid materials in such a manner that if the tank is ruptured, the contents will not discharge, flow, or be washed into the storm drainage system, surface waters, or groundwater.

- If the liquid is oil, gas, or other material that separates from and floats on water, install a spill control device (such as a tee section) in the catch basins that collects runoff from the storage tank area.

- Routine maintenance:
  - Place drip pans or absorbent materials beneath all mounted taps, and at all potential drip and spill locations during filling and unloading of tanks. Any collected liquids or soiled absorbent materials must be reused/recycled or properly disposed.
  - Store and maintain appropriate spill cleanup materials in a location known to all near the tank storage area; and ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
  - Sweep and clean the storage area monthly if it is paved, *do not hose down the area to a storm drain.*

  - Check tanks (and any containment sumps) daily for leaks and spills. Replace tanks that are leaking, corroded, or otherwise deteriorating with tanks in good condition. Collect all spilled liquids and properly dispose of them.

- Label all containers according to their contents (e.g., solvent, gasoline).
- Label hazardous substances regarding the potential hazard (corrosive, radioactive, flammable, explosive, poisonous).
- Prominently display required labels on transported hazardous and toxic materials (per US DOT regulations).
- Identify key spill response personnel.

Spill Control and Cleanup Activities

- Follow the Spill Prevention Control and Countermeasure Plan.
- Clean up leaks and spills immediately.
- Place a stockpile of spill cleanup materials where it will be readily accessible (e.g., near storage and maintenance areas).
- On paved surfaces, clean up spills with as little water as possible. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste. Physical methods for the cleanup of dry chemicals include the use of brooms, shovels, sweepers, or plows.
- Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
- Chemical cleanups of material can be achieved with the use of adsorbents, gels, and foams. Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.
- For larger spills, a private spill cleanup company or Hazmat team may be necessary.

Reporting

- Report spills that pose an immediate threat to human health or the environment to the Regional Water Quality Control Board.
- Federal regulations require that any oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hour).
- Report spills to local agencies, such as the fire department; they can assist in cleanup.
- Establish a system for tracking incidents. The system should be designed to identify the following:

  - Types and quantities (in some cases) of wastes

  - Patterns in time of occurrence (time of day/night, month, or year)

- Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)

- Responsible parties

Training

- Educate employees about spill prevention and cleanup.

- Well-trained employees can reduce human errors that lead to accidental releases or spills:

  - The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur.

  - Employees should be familiar with the Spill Prevention Control and Countermeasure Plan.

- Employees should be educated about aboveground storage tank requirements. Employees responsible for aboveground storage tanks and liquid transfers should be thoroughly familiar with the Spill Prevention Control and Countermeasure Plan and the plan should be readily available.

- Train employees to recognize and report illegal dumping incidents.

Other Considerations (Limitations and Regulations)

- A Spill Prevention Control and Countermeasure Plan (SPCC) is required for facilities that are subject to the oil pollution regulations specified in Part 112 of Title 40 of the Code of Federal Regulations or if they have a storage capacity of 10,000 gallons or more of petroleum. (Health and Safety Code 6.67)

- State regulations also exist for storage of hazardous materials (Health & Safety Code Chapter 6.95), including the preparation of area and business plans for emergency response to the releases or threatened releases.

- Consider requiring smaller secondary containment areas (less than 200 sq. ft.) to be connected to the sanitary sewer, prohibiting any hard connections to the storm drain.

Requirements

Costs (including capital and operation & maintenance)

- Will vary depending on the size of the facility and the necessary controls.

- Prevention of leaks and spills is inexpensive. Treatment and/or disposal of contaminated soil or water can be quite expensive.

Maintenance (including administrative and staffing)

- This BMP has no major administrative or staffing requirements. However, extra time is needed to properly handle and dispose of spills, which results in increased labor costs.

Supplemental Information

Further Detail of the BMP

Reporting

Record keeping and internal reporting represent good operating practices because they can increase the efficiency of the facility and the effectiveness of BMPs. A good record keeping system helps the facility minimize incident recurrence, correctly respond with appropriate cleanup activities, and comply with legal requirements. A record keeping and reporting system should be set up for documenting spills, leaks, and other discharges, including discharges of hazardous substances in reportable quantities. Incident records describe the quality and quantity of non-stormwater discharges to the storm sewer. These records should contain the following information:

- Date and time of the incident
- Weather conditions
- Duration of the spill/leak/discharge
- Cause of the spill/leak/discharge
- Response procedures implemented
- Persons notified
- Environmental problems associated with the spill/leak/discharge

Separate record keeping systems should be established to document housekeeping and preventive maintenance inspections, and training activities. All housekeeping and preventive maintenance inspections should be documented. Inspection documentation should contain the following information:

- The date and time the inspection was performed
- Name of the inspector
- Items inspected
- Problems noted
- Corrective action required
- Date corrective action was taken

Other means to document and record inspection results are field notes, timed and dated photographs, videotapes, and drawings and maps.

Aboveground Tank Leak and Spill Control

Accidental releases of materials from aboveground liquid storage tanks present the potential for contaminating stormwater with many different pollutants. Materials spilled, leaked, or lost from

tanks may accumulate in soils or on impervious surfaces and be carried away by stormwater runoff.

The most common causes of unintentional releases are:

- Installation problems
- Failure of piping systems (pipes, pumps, flanges, couplings, hoses, and valves)
- External corrosion and structural failure
- Spills and overfills due to operator error
- Leaks during pumping of liquids or gases from truck or rail car to a storage tank or vice versa

Storage of reactive, ignitable, or flammable liquids should comply with the Uniform Fire Code and the National Electric Code. Practices listed below should be employed to enhance the code requirements:

- Tanks should be placed in a designated area.
- Tanks located in areas where firearms are discharged should be encapsulated in concrete or the equivalent.
- Designated areas should be impervious and paved with Portland cement concrete, free of cracks and gaps, in order to contain leaks and spills.
- Liquid materials should be stored in UL approved double walled tanks or surrounded by a curb or dike to provide the volume to contain 10 percent of the volume of all of the containers or 110 percent of the volume of the largest container, whichever is greater. The area inside the curb should slope to a drain.
- For used oil or dangerous waste, a dead-end sump should be installed in the drain.
- All other liquids should be drained to the sanitary sewer if available. The drain must have a positive control such as a lock, valve, or plug to prevent release of contaminated liquids.
- Accumulated stormwater in petroleum storage areas should be passed through an oil/water separator.

Maintenance is critical to preventing leaks and spills. Conduct routine inspections and:

- Check for external corrosion and structural failure.
- Check for spills and overfills due to operator error.
- Check for failure of piping system (pipes, pumps, flanger, coupling, hoses, and valves).
- Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.

- Visually inspect new tank or container installation for loose fittings, poor welding, and improper or poorly fitted gaskets.
- Inspect tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.
- Frequently relocate accumulated stormwater during the wet season.
- Periodically conduct integrity testing by a qualified professional.

Vehicle Leak and Spill Control

Major spills on roadways and other public areas are generally handled by highly trained Hazmat teams from local fire departments or environmental health departments. The measures listed below pertain to leaks and smaller spills at vehicle maintenance shops.

In addition to implementing the spill prevention, control, and clean up practices above, use the following measures related to specific activities:

Vehicle and Equipment Maintenance

- Perform all vehicle fluid removal or changing inside or under cover to prevent the run-on of stormwater and the runoff of spills.
- Regularly inspect vehicles and equipment for leaks, and repair immediately.
- Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.
- Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- Immediately drain all fluids from wrecked vehicles.
- Store wrecked vehicles or damaged equipment under cover.
- Place drip pans or absorbent materials under heavy equipment when not in use.
- Use adsorbent materials on small spills rather than hosing down the spill.
- Remove the adsorbent materials promptly and dispose of properly.
- Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.
- Oil filters disposed of in trashcans or dumpsters can leak oil and contaminate stormwater. Place the oil filter in a funnel over a waste oil recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask your oil supplier or recycler about recycling oil filters.

- Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries, even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Vehicle and Equipment Fueling

- Design the fueling area to prevent the run-on of stormwater and the runoff of spills:
  - Cover fueling area if possible.
  - Use a perimeter drain or slope pavement inward with drainage to a sump.
  - Pave fueling area with concrete rather than asphalt.
- If dead-end sump is not used to collect spills, install an oil/water separator.
- Install vapor recovery nozzles to help control drips as well as air pollution.
- Discourage "topping-off' of fuel tanks.
- Use secondary containment when transferring fuel from the tank truck to the fuel tank.
- Use adsorbent materials on small spills and general cleaning rather than hosing down the area. Remove the adsorbent materials promptly.
- Carry out all Federal and State requirements regarding underground storage tanks, or install above ground tanks.
- Do not use mobile fueling of mobile industrial equipment around the facility; rather, transport the equipment to designated fueling areas.
- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Train employees in proper fueling and cleanup procedures.

Industrial Spill Prevention Response

For the purposes of developing a spill prevention and response program to meet the stormwater regulations, facility managers should use information provided in this fact sheet and the spill prevention/response portions of the fact sheets in this handbook, for specific activities. The program should:

- Integrate with existing emergency response/hazardous materials programs (e.g., Fire Department)
- Develop procedures to prevent/mitigate spills to storm drain systems
- Identify responsible departments
- Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures
- Address spills at municipal facilities, as well as public areas

- Provide training concerning spill prevention, response and cleanup to all appropriate personnel

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Stormwater Managers Resource Center http://www.stormwatercenter.net/

Outdoor Loading/Unloading SC-30

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

The loading/unloading of materials usually takes place outside on docks or terminals; therefore, materials spilled, leaked, or lost during loading/unloading may collect in the soil or on other surfaces and have the potential to be carried away by stormwater runoff or when the area is cleaned. Additionally, rainfall may wash pollutants from machinery used to unload or move materials. Implementation of the following protocols will prevent or reduce the discharge of pollutants to stormwater from outdoor loading/unloading of materials.

Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

Pollution Prevention

- Keep accurate maintenance logs to evaluate materials removed and improvements made.
- Park tank trucks or delivery vehicles in designated areas so that spills or leaks can be contained.
- Limit exposure of material to rainfall whenever possible.
- Prevent stormwater run-on.
- Check equipment regularly for leaks.

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Suggested Protocols

Loading and Unloading – General Guidelines

- Develop an operations plan that describes procedures for loading and/or unloading.
- Conduct loading and unloading in dry weather if possible.
- Cover designated loading/unloading areas to reduce exposure of materials to rain.
- Consider placing a seal or door skirt between delivery vehicles and building to prevent exposure to rain.
- Design loading/unloading area to prevent stormwater run-on, which would include grading or berming the area, and position roof downspouts so they direct stormwater away from the loading/unloading areas.
- Have employees load and unload all materials and equipment in covered areas such as building overhangs at loading docks if feasible.
- Load/unload only at designated loading areas.
- Use drip pans underneath hose and pipe connections and other leak-prone spots during liquid transfer operations, and when making and breaking connections. Several drip pans should be stored in a covered location near the liquid transfer area so that they are always available, yet protected from precipitation when not in use. Drip pans can be made specifically for railroad tracks. Drip pans must be cleaned periodically, and drip collected materials must be disposed of properly.
- Pave loading areas with concrete instead of asphalt.
- Avoid placing storm drains in the area.
- Grade and/or berm the loading/unloading area to a drain that is connected to a deadend.

Inspection

- Check loading and unloading equipment regularly for leaks, including valves, pumps, flanges and connections.
- Look for dust or fumes during loading or unloading operations.

Training

- Train employees (e.g., fork lift operators) and contractors on proper spill containment and cleanup.
- Have employees trained in spill containment and cleanup present during loading/unloading.
- Train employees in proper handling techniques during liquid transfers to avoid spills.
- Make sure forklift operators are properly trained on loading and unloading procedures.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Contain leaks during transfer.
- Store and maintain appropriate spill cleanup materials in a location that is readily accessible and known to all and ensure that employees are familiar with the site's spill control plan and proper spill cleanup procedures.
- Have an emergency spill cleanup plan readily available.
- Use drip pans or comparable devices when transferring oils, solvents, and paints.

Other Considerations (Limitations and Regulations)

- Space and time limitations may preclude all transfers from being performed indoors or under cover.
- It may not be possible to conduct transfers only during dry weather.

Requirements

Costs

Costs should be low except when covering a large loading/unloading area.

Maintenance

- Conduct regular inspections and make repairs as necessary. The frequency of repairs will depend on the age of the facility.
- Check loading and unloading equipment regularly for leaks.
- Conduct regular broom dry-sweeping of area.

Supplemental Information

Further Detail of the BMP

Special Circumstances for Indoor Loading/Unloading of Materials

Loading or unloading of liquids should occur in the manufacturing building so that any spills that are not completely retained can be discharged to the sanitary sewer, treatment plant, or treated in a manner consistent with local sewer authorities and permit requirements.

- For loading and unloading tank trucks to above and below ground storage tanks, the following procedures should be used:
  - The area where the transfer takes place should be paved. If the liquid is reactive with the asphalt, Portland cement should be used to pave the area.
  - The transfer area should be designed to prevent run-on of stormwater from adjacent areas. Sloping the pad and using a curb, like a speed bump, around the uphill side of the transfer area should reduce run-on.

- The transfer area should be designed to prevent runoff of spilled liquids from the area. Sloping the area to a drain should prevent runoff. The drain should be connected to a dead-end sump or to the sanitary sewer. A positive control valve should be installed on the drain.

- For transfer from rail cars to storage tanks that must occur outside, use the following procedures:

  - Drip pans should be placed at locations where spillage may occur, such as hose connections, hose reels, and filler nozzles. Use drip pans when making and breaking connections.

  - Drip pan systems should be installed between the rails to collect spillage from tank cars.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Safer Alternative Products SC-35

Description

Promote the use of less harmful products and products that contain little or no TMDL pollutants. Alternatives exist for most product classes including chemical fertilizers, pesticides, cleaning solutions, janitorial chemicals, automotive and paint products, and consumables (batteries, fluorescent lamps).

Approach

Pattern a new program after the many established programs around the state and country. Integrate this best management practice as much as possible with existing programs at your facility.

Develop a comprehensive program based on:

- The "Precautionary Principle," which is an alternative to the "Risk Assessment" model that says it's acceptable to use a potentially harmful product until physical evidence of its harmful effects are established and deemed too costly from an environmental or public health perspective. For instance, a risk assessment approach might say it's acceptable to use a pesticide until there is direct proof of an environmental impact. The Precautionary Principle approach is used to evaluate whether a given product is safe, whether it is really necessary, and whether alternative products would perform just as well.
- Environmentally Preferable Purchasing Program to minimize the purchase of products containing hazardous ingredients used in the facility's custodial services, fleet maintenance, and facility maintenance in favor of using alternate products that pose less risk to employees and to the environment.
- Integrated Pest Management (IPM) or Less-Toxic Pesticide Program, which uses a pest management approach that minimizes the use of toxic chemicals and gets rid of pests by methods that pose a lower risk to employees, the public, and the environment.
- Energy Efficiency Program including no-cost and low-cost energy conservation and efficiency actions that can reduce both energy consumption and electricity bills, along with long-term energy efficiency investments.

Consider the following mechanisms for developing and implementing a comprehensive program:

- Policies

Objectives

- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	
Nutrients	✓
Trash	
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

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- Procedures
  - Standard operating procedures (SOPs)
  - Purchasing guidelines and procedures
  - Bid packages (services and supplies)
- Materials
  - Preferred or approved product and supplier lists
  - Product and supplier evaluation criteria
  - Training sessions and manuals
  - Fact sheets for employees

Implement this BMP in conjunction with the Vehicle and Equipment Management fact sheets (SC20 – SC22) and SC41, Building and Grounds Maintenance.

Training

- Employees who handle potentially harmful materials in the use of safer alternatives.
- Purchasing departments should be encouraged to procure less hazardous materials and products that contain little or no harmful substances or TMDL pollutants.

Regulations

This BMP has no regulatory requirements. Existing regulations already encourage facilities to reduce the use of hazardous materials through incentives such as reduced:

- Specialized equipment storage and handling requirements,
- Storm water runoff sampling requirements,
- Training and licensing requirements, and
- Record keeping and reporting requirements.

Equipment

- There are no major equipment requirements to this BMP.

Limitations

- Alternative products may not be available, suitable, or effective in every case.

Requirements

Cost Considerations

- The primary cost is for staff time to: 1) develop new policies and procedures and 2) educate purchasing departments and employees who handle potentially harmful materials about the availability, procurement, and use of safer alternatives.

- Some alternative products may be slightly more expensive than conventional products.

Supplemental Information

Employees and contractors / service providers can both be educated about safer alternatives by using information developed by a number of organizations including the references and resources listed below.

The following discussion provides some general information on safer alternatives. More specific information on particular hazardous materials and the available alternatives may be found in the references and resources listed below.

- Automotive products – Less toxic alternatives are not available for many automotive products, especially engine fluids. But there are alternatives to grease lubricants, car polishes, degreasers, and windshield washer solution. Rerefined motor oil is also available.
- Vehicle/Trailer lubrication – Fifth wheel bearings on trucks require routine lubrication. Adhesive lubricants are available to replace typical chassis grease.
- Cleaners – Vegetables-based or citrus-based soaps are available to replace petroleum-based soaps/detergents.
- Paint products – Water-based paints, wood preservatives, stains, and finishes are available.
- Pesticides – Specific alternative products or methods exist to control most insects, fungi, and weeds.
- Chemical Fertilizers – Compost and soil amendments are natural alternatives.
- Consumables – Manufacturers have either reduced or are in the process of reducing the amount of heavy metals in consumables such as batteries and fluorescent lamps. All fluorescent lamps contain mercury, however low-mercury containing lamps are now available from most hardware and lighting stores. Fluorescent lamps are also more energy efficient than the average incandescent lamp.
- Janitorial chemicals – Even biodegradable soap can harm fish and wildlife before it biodegrades. Biodegradable does not mean non-toxic. Safer products and procedures are available for floor stripping and cleaning, as well as carpet, glass, metal, and restroom cleaning and disinfecting.

Examples

There are a number of business and trade associations, and communities with effective programs. Some of the more prominent are listed below in the references and resources section.

References and Resources

Note: Many of these references provide alternative products for materials that typically are used inside and disposed to the sanitary sewer as well as alternatives to products that usually end up in the storm drain.

General Sustainable Practices and Pollution Prevention Including Pollutant-Specific Information

California Department of Toxic Substances Control (www.dtsc.ca.gov)

California Integrated Waste Management Board (www.ciwmb.ca.gov)

City of Santa Monica (www.santa-monica.org/environment)

City of Palo Alto (www.city.palo-alto.ca.us/cleanbay)

City and County of San Francisco, Department of the Environment (www.ci.sf.ca.us/sfenvironment)

Earth 911 (www.earth911.org/master.asp)

Environmental Finance Center Region IX (www.greenstart.org/efc9)

Flex Your Power (www.flexyourpower.ca.gov)

GreenBiz.com (www.greenbiz.com)

Green Business Program (www.abag.org/bayarea/enviro/gbus/gb.html)

Pacific Industrial and Business Association (www.piba.org)

Sacramento Clean Water Business Partners (www.sacstormwater.org)

USEPA BMP fact sheet – Alternative products (http://cfpub.epa.gov/npdes/stormwater/menuofbmps/poll_2.cfm)

USEPA Region IX Pollution Prevention Program (www.epa.gov/region09/p2)

Western Regional Pollution Prevention Network (www.westp2net.org)

Metals (mercury, copper)

National Electrical Manufacturers Association - Environment, Health and Safety (www.nema.org)

Sustainable Conservation (www.suscon.org)

- Auto Recycling Project
- Brake Pad Partnership

Pesticides and Chemical Fertilizers

Bio-Integral Resource Center (www.birc.org)

California Department of Pesticide Regulation (www.cdpr.ca.gov)

University of California Statewide IPM Program (www.ipm.ucdavis.edu/default.html)

Dioxins

Bay Area Dioxins Project (http://dioxin.abag.ca.gov/)

Building & Grounds Maintenance SC-41

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	
Metals	✓
Bacteria	✓
Oil and Grease	
Organics	

Description

Stormwater runoff from building and grounds maintenance activities can be contaminated with toxic hydrocarbons in solvents, fertilizers and pesticides, suspended solids, heavy metals, abnormal pH, and oils and greases. Utilizing the protocols in this fact sheet will prevent or reduce the discharge of pollutants to stormwater from building and grounds maintenance activities by washing and cleaning up with as little water as possible, following good landscape management practices, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the stormwater collection system.

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

Pollution Prevention

- Switch to non-toxic chemicals for maintenance when possible.
- Choose cleaning agents that can be recycled.
- Encourage proper lawn management and landscaping, including use of native vegetation.

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- Encourage use of Integrated Pest Management techniques for pest control.
- Encourage proper onsite recycling of yard trimmings.
- Recycle residual paints, solvents, lumber, and other material as much as possible.

Suggested Protocols

Pressure Washing of Buildings, Rooftops, and Other Large Objects

- In situations where soaps or detergents are used and the surrounding area is paved, pressure washers must use a water collection device that enables collection of wash water and associated solids. A sump pump, wet vacuum or similarly effective device must be used to collect the runoff and loose materials. The collected runoff and solids must be disposed of properly.
- If soaps or detergents are not used, and the surrounding area is paved, wash runoff does not have to be collected but must be screened. Pressure washers must use filter fabric or some other type of screen on the ground and/or in the catch basin to trap the particles in wash water runoff.
- If you are pressure washing on a grassed area (with or without soap), runoff must be dispersed as sheet flow as much as possible, rather than as a concentrated stream. The wash runoff must remain on the grass and not drain to pavement.

Landscaping Activities

- Dispose of grass clippings, leaves, sticks, or other collected vegetation as garbage, or by composting. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures on exposed soils.

Building Repair, Remodeling, and Construction

- Do not dump any toxic substance or liquid waste on the pavement, the ground, or toward a storm drain.
- Use ground or drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of collected material daily.
- Use a ground cloth or oversized tub for activities such as paint mixing and tool cleaning.
- Clean paintbrushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain. Brushes and tools covered with non-water-based paints, finishes, or other materials must be cleaned in a manner that enables collection of used solvents (e.g., paint thinner, turpentine, etc.) for recycling or proper disposal.
- Use a storm drain cover, filter fabric, or similarly effective runoff control mechanism if dust, grit, wash water, or other pollutants may escape the work area and enter a catch basin. This is particularly necessary on rainy days. The containment device(s) must be in place at the beginning of the work day, and accumulated dirty runoff and solids must be collected and disposed of before removing the containment device(s) at the end of the work day.

- If you need to de-water an excavation site, you may need to filter the water before discharging to a catch basin or off-site. If directed off-site, you should direct the water through hay bales and filter fabric or use other sediment filters or traps.
- Store toxic material under cover during precipitation events and when not in use. A cover would include tarps or other temporary cover material.

Mowing, Trimming, and Planting

- Dispose of leaves, sticks, or other collected vegetation as garbage, by composting or at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures when soils are exposed.
- Place temporarily stockpiled material away from watercourses and drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.
- Consider an alternative approach when bailing out muddy water: do not put it in the storm drain; pour over landscaped areas.
- Use hand weeding where practical.

Fertilizer and Pesticide Management

- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.
- Use less toxic pesticides that will do the job when applicable. Avoid use of copper-based pesticides if possible.
- Do not use pesticides if rain is expected.
- Do not mix or prepare pesticides for application near storm drains.
- Use the minimum amount needed for the job.
- Calibrate fertilizer distributors to avoid excessive application.
- Employ techniques to minimize off-target application (e.g., spray drift) of pesticides, including consideration of alternative application techniques.
- Apply pesticides only when wind speeds are low.
- Fertilizers should be worked into the soil rather than dumped or broadcast onto the surface.
- Irrigate slowly to prevent runoff and then only as much as is needed.
- Clean pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
- Dispose of empty pesticide containers according to the instructions on the container label.

- Use up the pesticides. Rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- Implement storage requirements for pesticide products with guidance from the local fire department and County Agricultural Commissioner. Provide secondary containment for pesticides.

Inspection

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering and repair leaks in the irrigation system as soon as they are observed.

Training

- Educate and train employees on pesticide use and in pesticide application techniques to prevent pollution.
- Train employees and contractors in proper techniques for spill containment and cleanup.
- Be sure the frequency of training takes into account the complexity of the operations and the nature of the staff.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials, such as brooms, dustpans, and vacuum sweepers (if desired) near the storage area where it will be readily accessible.
- Have employees trained in spill containment and cleanup present during the loading/unloading of dangerous wastes, liquid chemicals, or other materials.
- Familiarize employees with the Spill Prevention Control and Countermeasure Plan.
- Clean up spills immediately.

Other Considerations

Alternative pest/weed controls may not be available, suitable, or effective in many cases.

Requirements

Costs

- Cost will vary depending on the type and size of facility.
- Overall costs should be low in comparison to other BMPs.

Maintenance

Sweep paved areas regularly to collect loose particles. Wipe up spills with rags and other absorbent material immediately, do not hose down the area to a storm drain.

Supplemental Information

Further Detail of the BMP

Fire Sprinkler Line Flushing

Building fire sprinkler line flushing may be a source of non-stormwater runoff pollution. The water entering the system is usually potable water, though in some areas it may be non-potable reclaimed wastewater. There are subsequent factors that may drastically reduce the quality of the water in such systems. Black iron pipe is usually used since it is cheaper than potable piping, but it is subject to rusting and results in lower quality water. Initially, the black iron pipe has an oil coating to protect it from rusting between manufacture and installation; this will contaminate the water from the first flush but not from subsequent flushes. Nitrates, poly-phosphates and other corrosion inhibitors, as well as fire suppressants and antifreeze may be added to the sprinkler water system. Water generally remains in the sprinkler system a long time (typically a year) and between flushes may accumulate iron, manganese, lead, copper, nickel, and zinc. The water generally becomes anoxic and contains living and dead bacteria and breakdown products from chlorination. This may result in a significant BOD problem and the water often smells. Consequently dispose fire sprinkler line flush water into the sanitary sewer. Do not allow discharge to storm drain or infiltration due to potential high levels of pollutants in fire sprinkler line water.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Mobile Cleaners Pilot Program: Final Report. 1997. Bay Area Stormwater Management Agencies Association (BASMAA). http://www.basmaa.org/

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA). http://www.basmaa.org/

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Building Repair and Construction SC-42

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Recycle

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Description

Modifications are common particularly at large industrial sites. The activity may vary from minor and normal building repair to major remodeling, or the construction of new facilities. These activities can generate pollutants including solvents, paints, paint and varnish removers, finishing residues, spent thinners, soap cleaners, kerosene, asphalt and concrete materials, adhesive residues, and old asbestos installation. Protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants to stormwater from building repair, remodeling, and construction by using soil erosion controls, enclosing or covering building material storage areas, using good housekeeping practices, using safer alternative products, and training employees.

Approach

Pollution Prevention

- Recycle residual paints, solvents, lumber, and other materials to the maximum extent practical.
- Buy recycled products to the maximum extent practical.
- Inform on-site contractors of company policy on these matters and include appropriate provisions in their contract to ensure certain proper housekeeping and disposal practices are implemented.

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- Make sure that nearby storm drains are well marked to minimize the chance of inadvertent disposal of residual paints and other liquids.

Suggested Protocols

Repair & Remodeling

- Follow BMPs identified in Construction BMP Handbook.
- Maintain good housekeeping practices while work is underway.
- Keep the work site clean and orderly. Remove debris in a timely fashion. Sweep the area.
- Cover materials of particular concern that must be left outside, particularly during the rainy season.
- Do not dump waste liquids down the storm drain.
- Dispose of wash water, sweepings, and sediments properly.
- Store materials properly that are normally used in repair and remodeling such as paints and solvents.
- Sweep out the gutter or wash the gutter and trap the particles at the outlet of the downspout if when repairing roofs, small particles have accumulated in the gutter. A sock or geofabric placed over the outlet may effectively trap the materials. If the downspout is tight lined, place a temporary plug at the first convenient point in the storm drain and pump out the water with a vactor truck, and clean the catch basin sump where you placed the plug.
- Properly store and dispose waste materials generated from construction activities. See Construction BMP Handbook.
- Clean the storm drain system in the immediate vicinity of the construction activity after it is completed.

Painting

- Enclose painting operations consistent with local air quality regulations and OSHA.
- Local air pollution regulations may, in many areas of the state, specify painting procedures which if properly carried out are usually sufficient to protect water quality.
- Develop paint handling procedures for proper use, storage, and disposal of paints.
- Transport paint and materials to and from job sites in containers with secure lids and tied down to the transport vehicle.
- Test and inspect spray equipment prior to starting to paint. Tighten all hoses and connections and do not overfill paint containers.
- Mix paint indoors before using so that any spill will not be exposed to rain. Do so even during dry weather because cleanup of a spill will never be 100% effective.
- Transfer and load paint and hot thermoplastic away from storm drain inlets.

- Do not transfer or load paint near storm drain inlets.
- Plug nearby storm drain inlets prior to starting painting and remove plugs when job is complete when there is significant risk of a spill reaching storm drains.
- Cover nearby storm drain inlets prior to starting work if sand blasting is used to remove paint.
- Use a ground cloth to collect the chips if painting requires scraping or sand blasting of the existing surface. Dispose the residue properly.
- Cover or enclose painting operations properly to avoid drift.
- Clean the application equipment in a sink that is connected to the sanitary sewer if using water based paints.
- Capture all cleanup-water and dispose of properly.
- Dispose of paints containing lead or tributyl tin and considered a hazardous waste properly.
- Store leftover paints if they are to be kept for the next job properly, or dispose properly.
- Recycle paint when possible. Dispose of paint at an appropriate household hazardous waste facility.

Training

Proper education of off-site contractors is often overlooked. The conscientious efforts of well trained employees can be lost by unknowing off-site contractors, so make sure they are well informed about what they are expected to do.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Clean up spills immediately.
- Excavate and remove the contaminated (stained) soil if a spill occurs on dirt.

Limitations

- This BMP is for minor construction only. The State's General Construction Activity Stormwater Permit has more requirements for larger projects. The companion "Construction Best Management Practice Handbook" contains specific guidance and best management practices for larger-scale projects.
- Hazardous waste that cannot be reused or recycled must be disposed of by a licensed hazardous waste hauler.
- Be certain that actions to help stormwater quality are consistent with Cal- and Fed-OSHA and air quality regulations.

SC-42 Building Repair and Construction

Requirements

Costs

These BMPs are generally low to modest in cost.

Maintenance

N/A

Supplemental Information

Further Detail of the BMP

Soil/Erosion Control

If the work involves exposing large areas of soil, employ the appropriate soil erosion and control techniques. See the Construction Best Management Practice Handbook. If old buildings are being torn down and not replaced in the near future, stabilize the site using measures described in SC-40 Contaminated or Erodible Areas.

If a building is to be placed over an open area with a storm drainage system, make sure the storm inlets within the building are covered or removed, or the storm line is connected to the sanitary sewer. If because of the remodeling a new drainage system is to be installed or the existing system is to be modified, consider installing catch basins as they serve as effective "in-line" treatment devices. See Treatment Control Fact Sheet TC-20 Wet Pond/Basin in Section 5 of the New Development and Redevelopment Handbook regarding design criteria. Include in the catch basin a "turn-down" elbow or similar device to trap floatables.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Parking/Storage Area Maintenance SC-43

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Description

Parking lots and storage areas can contribute a number of substances, such as trash, suspended solids, hydrocarbons, oil and grease, and heavy metals that can enter receiving waters through stormwater runoff or non-stormwater discharges. The protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants from parking/storage areas and include using good housekeeping practices, following appropriate cleaning BMPs, and training employees.

Approach

The goal of this program is to ensure stormwater pollution prevention practices are considered when conducting activities on or around parking areas and storage areas to reduce potential for pollutant discharge to receiving waters. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

Pollution Prevention

- Encourage alternative designs and maintenance strategies for impervious parking lots. (See New Development and Redevelopment BMP Handbook)
- Keep accurate maintenance logs to evaluate BMP implementation.

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SC-43 Parking/Storage Area Maintenance

Suggested Protocols

General

- Keep the parking and storage areas clean and orderly. Remove debris in a timely fashion.
- Allow sheet runoff to flow into biofilters (vegetated strip and swale) and/or infiltration devices.
- Utilize sand filters or oleophilic collectors for oily waste in low quantities.
- Arrange rooftop drains to prevent drainage directly onto paved surfaces.
- Design lot to include semi-permeable hardscape.
- Discharge soapy water remaining in mop or wash buckets to the sanitary sewer through a sink, toilet, clean-out, or wash area with drain.

Controlling Litter

- Post "No Littering" signs and enforce anti-litter laws.
- Provide an adequate number of litter receptacles.
- Clean out and cover litter receptacles frequently to prevent spillage.
- Provide trash receptacles in parking lots to discourage litter.
- Routinely sweep, shovel, and dispose of litter in the trash.

Surface Cleaning

- Use dry cleaning methods (e.g., sweeping, vacuuming) to prevent the discharge of pollutants into the stormwater conveyance system if possible.
- Establish frequency of public parking lot sweeping based on usage and field observations of waste accumulation.
- Sweep all parking lots at least once before the onset of the wet season.
- Follow the procedures below if water is used to clean surfaces:
  - Block the storm drain or contain runoff.
  - Collect and pump wash water to the sanitary sewer or discharge to a pervious surface. Do not allow wash water to enter storm drains.
  - Dispose of parking lot sweeping debris and dirt at a landfill.
- Follow the procedures below when cleaning heavy oily deposits:
  - Clean oily spots with absorbent materials.
  - Use a screen or filter fabric over inlet, then wash surfaces.

- Do not allow discharges to the storm drain.
- Vacuum/pump discharges to a tank or discharge to sanitary sewer.
- Appropriately dispose of spilled materials and absorbents.

Surface Repair

- Preheat, transfer or load hot bituminous material away from storm drain inlets.
- Apply concrete, asphalt, and seal coat during dry weather to prevent contamination from contacting stormwater runoff.
- Cover and seal nearby storm drain inlets where applicable (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal.
- Use only as much water as necessary for dust control, to avoid runoff.
- Catch drips from paving equipment that is not in use with pans or absorbent material placed under the machines. Dispose of collected material and absorbents properly.

Inspection

- Have designated personnel conduct inspections of parking facilities and stormwater conveyance systems associated with parking facilities on a regular basis.
- Inspect cleaning equipment/sweepers for leaks on a regular basis.

Training

- Provide regular training to field employees and/or contractors regarding cleaning of paved areas and proper operation of equipment.
- Train employees and contractors in proper techniques for spill containment and cleanup.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials where it will be readily accessible or at a central location.
- Clean up fluid spills immediately with absorbent rags or material.
- Dispose of spilled material and absorbents properly.

Other Considerations

Limitations related to sweeping activities at large parking facilities may include high equipment costs, the need for sweeper operator training, and the inability of current sweeper technology to remove oil and grease.

SC-43 Parking/Storage Area Maintenance

Requirements

Costs

Cleaning/sweeping costs can be quite large. Construction and maintenance of stormwater structural controls can be quite expensive as well.

Maintenance

- Sweep parking lot regularly to minimize cleaning with water.
- Clean out oil/water/sand separators regularly, especially after heavy storms.
- Clean parking facilities regularly to prevent accumulated wastes and pollutants from being discharged into conveyance systems during rainy conditions.

Supplemental Information

Further Detail of the BMP

Surface Repair

Apply concrete, asphalt, and seal coat during dry weather to prevent contamination from contacting stormwater runoff. Where applicable, cover and seal nearby storm drain inlets (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal. Only use only as much water as is necessary for dust control to avoid runoff.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA). http://www.basmaa.org/

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Drainage System Maintenance SC-44

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize

Description

As a consequence of its function, the stormwater conveyance system collects and transports urban runoff and stormwater that may contain certain pollutants. The protocols in this fact sheet are intended to reduce pollutants reaching receiving waters through proper conveyance system operation and maintenance.

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	
Bacteria	✓
Oil and Grease	
Organics	

Approach

Pollution Prevention

Maintain catch basins, stormwater inlets, and other stormwater conveyance structures on a regular basis to remove pollutants, reduce high pollutant concentrations during the first flush of storms, prevent clogging of the downstream conveyance system, restore catch basins' sediment trapping capacity, and ensure the system functions properly hydraulically to avoid flooding.

Suggested Protocols

Catch Basins/Inlet Structures

- Staff should regularly inspect facilities to ensure compliance with the following:
  - Immediate repair of any deterioration threatening structural integrity.
  - Cleaning before the sump is 40% full. Catch basins should be cleaned as frequently as needed to meet this standard.
  - Stenciling of catch basins and inlets (see SC34 Waste Handling and Disposal).

- Clean catch basins, storm drain inlets, and other conveyance structures before the wet season to remove sediments and debris accumulated during the summer.
- Conduct inspections more frequently during the wet season for problem areas where sediment or trash accumulates more often. Clean and repair as needed.
- Keep accurate logs of the number of catch basins cleaned.
- Store wastes collected from cleaning activities of the drainage system in appropriate containers or temporary storage sites in a manner that prevents discharge to the storm drain.
- Dewater the wastes if necessary with outflow into the sanitary sewer if permitted. Water should be treated with an appropriate filtering device prior to discharge to the sanitary sewer. If discharge to the sanitary sewer is not allowed, water should be pumped or vacuumed to a tank and properly disposed. Do not dewater near a storm drain or stream.

Storm Drain Conveyance System

- Locate reaches of storm drain with deposit problems and develop a flushing schedule that keeps the pipe clear of excessive buildup.
- Collect and pump flushed effluent to the sanitary sewer for treatment whenever possible.

Pump Stations

- Clean all storm drain pump stations prior to the wet season to remove silt and trash.
- Do not allow discharge to reach the storm drain system when cleaning a storm drain pump station or other facility.
- Conduct routine maintenance at each pump station.
- Inspect, clean, and repair as necessary all outlet structures prior to the wet season.

Open Channel

- Modify storm channel characteristics to improve channel hydraulics, increase pollutant removals, and enhance channel/creek aesthetic and habitat value.
- Conduct channel modification/improvement in accordance with existing laws. Any person, government agency, or public utility proposing an activity that will change the natural (emphasis added) state of any river, stream, or lake in California, must enter into a Steam or Lake Alteration Agreement with the Department of Fish and Game. The developer-applicant should also contact local governments (city, county, special districts), other state agencies (SWRCB, RWQCB, Department of Forestry, Department of Water Resources), and Federal Corps of Engineers and USFWS.

Illicit Connections and Discharges

- Look for evidence of illegal discharges or illicit connections during routine maintenance of conveyance system and drainage structures:
  - Is there evidence of spills such as paints, discoloring, etc?

- Are there any odors associated with the drainage system?
- Record locations of apparent illegal discharges/illicit connections?
- Track flows back to potential dischargers and conduct aboveground inspections. This can be done through visual inspection of upgradient manholes or alternate techniques including zinc chloride smoke testing, fluorometric dye testing, physical inspection testing, or television camera inspection.
- Eliminate the discharge once the origin of flow is established.

- Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

Illegal Dumping

- Inspect and clean up hot spots and other storm drainage areas regularly where illegal dumping and disposal occurs.
- Establish a system for tracking incidents. The system should be designed to identify the following:
  - Illegal dumping hot spots
  - Types and quantities (in some cases) of wastes
  - Patterns in time of occurrence (time of day/night, month, or year)
  - Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
  - Responsible parties
- Post "No Dumping" signs in problem areas with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

Training

- Train crews in proper maintenance activities, including record keeping and disposal.
- Allow only properly trained individuals to handle hazardous materials/wastes.
- Have staff involved in detection and removal of illicit connections trained in the following:
  - OSHA-required Health and Safety Training (29 CFR 1910.120) plus annual refresher training (as needed).

- OSHA Confined Space Entry training (Cal-OSHA Confined Space, Title 8 and Federal OSHA 29 CFR 1910.146).

- Procedural training (field screening, sampling, smoke/dye testing, TV inspection).

Spill Response and Prevention

- Investigate all reports of spills, leaks, and/or illegal dumping promptly.
- Clean up all spills and leaks using "dry" methods (with absorbent materials and/or rags) or dig up, remove, and properly dispose of contaminated soil.
- Refer to fact sheet SC-11 Spill Prevention, Control, and Cleanup.

Other Considerations (Limitations and Regulations)

- Clean-up activities may create a slight disturbance for local aquatic species. Access to items and material on private property may be limited. Trade-offs may exist between channel hydraulics and water quality/riparian habitat. If storm channels or basins are recognized as wetlands, many activities, including maintenance, may be subject to regulation and permitting.
- Storm drain flushing is most effective in small diameter pipes (36-inch diameter pipe or less, depending on water supply and sediment collection capacity). Other considerations associated with storm drain flushing may include the availability of a water source, finding a downstream area to collect sediments, liquid/sediment disposal, and prohibition against disposal of flushed effluent to sanitary sewer in some areas.
- Regulations may include adoption of substantial penalties for illegal dumping and disposal.
- Local municipal codes may include sections prohibiting discharge of soil, debris, refuse, hazardous wastes, and other pollutants into the storm drain system.

Requirements

Costs

- An aggressive catch basin cleaning program could require a significant capital and O&M budget.
- The elimination of illegal dumping is dependent on the availability, convenience, and cost of alternative means of disposal. The primary cost is for staff time. Cost depends on how aggressively a program is implemented. Other cost considerations for an illegal dumping program include:

  - Purchase and installation of signs.

  - Rental of vehicle(s) to haul illegally-disposed items and material to landfills.

  - Rental of heavy equipment to remove larger items (e.g., car bodies) from channels.

  - Purchase of landfill space to dispose of illegally-dumped items and material.

- Methods used for illicit connection detection (smoke testing, dye testing, visual inspection, and flow monitoring) can be costly and time-consuming. Site-specific factors, such as the level of impervious area, the density and ages of buildings, and type of land use will determine the level of investigation necessary.

Maintenance

- Two-person teams may be required to clean catch basins with vactor trucks.
- Teams of at least two people plus administrative personnel are required to identify illicit discharges, depending on the complexity of the storm sewer system.
- Arrangements must be made for proper disposal of collected wastes.
- Technical staff are required to detect and investigate illegal dumping violations.

Supplemental Information

Further Detail of the BMP

Storm Drain Flushing

Flushing is a common maintenance activity used to improve pipe hydraulics and to remove pollutants in storm drainage systems. Flushing may be designed to hydraulically convey accumulated material to strategic locations, such as an open channel, another point where flushing will be initiated, or the sanitary sewer and the treatment facilities, thus preventing resuspension and overflow of a portion of the solids during storm events. Flushing prevents "plug flow" discharges of concentrated pollutant loadings and sediments. Deposits can hinder the designed conveyance capacity of the storm drain system and potentially cause backwater conditions in severe cases of clogging.

Storm drain flushing usually takes place along segments of pipe with grades that are too flat to maintain adequate velocity to keep particles in suspension. An upstream manhole is selected to place an inflatable device that temporarily plugs the pipe. Further upstream, water is pumped into the line to create a flushing wave. When the upstream reach of pipe is sufficiently full to cause a flushing wave, the inflated device is rapidly deflated with the assistance of a vacuum pump, thereby releasing the backed up water and resulting in the cleaning of the storm drain segment.

To further reduce impacts of stormwater pollution, a second inflatable device placed well downstream may be used to recollect the water after the force of the flushing wave has dissipated. A pump may then be used to transfer the water and accumulated material to the sanitary sewer for treatment. In some cases, an interceptor structure may be more practical or required to recollect the flushed waters.

It has been found that cleansing efficiency of periodic flush waves is dependent upon flush volume, flush discharge rate, sewer slope, sewer length, sewer flow rate, sewer diameter, and population density. As a rule of thumb, the length of line to be flushed should not exceed 700 feet. At this maximum recommended length, the percent removal efficiency ranges between 65-75% for organics and 55-65% for dry weather grit/inorganic material. The percent removal efficiency drops rapidly beyond that. Water is commonly supplied by a water truck, but fire hydrants can also supply water. To make the best use of water, it is recommended that reclaimed water be used or that fire hydrant line flushing coincide with storm sewer flushing.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

Ferguson, B.K. 1991. Urban Stream Reclamation, p. 324-322, Journal of Soil and Water Conservation.

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net

United States Environmental Protection Agency (USEPA). 2002. Pollution Prevention/Good Housekeeping for Municipal Operations Storm Drain System Cleaning. On line:
http://www.epa.gov/npdes/menuofbmps/poll_16.htm

Housekeeping Practices SC-60

Description

Promote efficient and safe housekeeping practices (storage, use, and cleanup) when handling potentially harmful materials such as fertilizers, pesticides, cleaning solutions, paint products, automotive products, and swimming pool chemicals. Related information is provided in BMP fact sheets SC-11 Spill Prevention, Control & Cleanup and SC-34 Waste Handling & Disposal.

Approach

Pollution Prevention

- Purchase only the amount of material that will be needed for foreseeable use. In most cases this will result in cost savings in both purchasing and disposal. See SC-61 Safer Alternative Products for additional information.
- Be aware of new products that may do the same job with less environmental risk and for less or the equivalent cost. Total cost must be used here; this includes purchase price, transportation costs, storage costs, use related costs, clean up costs and disposal costs.

Suggested Protocols

General

- Keep work sites clean and orderly. Remove debris in a timely fashion. Sweep the area.
- Dispose of wash water, sweepings, and sediments, properly.
- Recycle or dispose of fluids properly.
- Establish a daily checklist of office, yard and plant areas to confirm cleanliness and adherence to proper storage and security. Specific employees should be assigned specific inspection responsibilities and given the authority to remedy any problems found.
- Post waste disposal charts in appropriate locations detailing for each waste its hazardous nature (poison, corrosive, flammable), prohibitions on its disposal (dumpster, drain, sewer) and the recommended disposal method (recycle, sewer, burn, storage, landfill).
- Summarize the chosen BMPs applicable to your operation and post them in appropriate conspicuous places.

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

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- Require a signed checklist from every user of any hazardous material detailing amount taken, amount used, amount returned and disposal of spent material.
- Do a before audit of your site to establish baseline conditions and regular subsequent audits to note any changes and whether conditions are improving or deteriorating.
- Keep records of water, air and solid waste quantities and quality tests and their disposition.
- Maintain a mass balance of incoming, outgoing and on hand materials so you know when there are unknown losses that need to be tracked down and accounted for.
- Use and reward employee suggestions related to BMPs, hazards, pollution reduction, work place safety, cost reduction, alternative materials and procedures, recycling and disposal.
- Have, and review regularly, a contingency plan for spills, leaks, weather extremes etc. Make sure all employees know about it and what their role is so that it comes into force automatically.

Training

- Train all employees, management, office, yard, manufacturing, field and clerical in BMPs and pollution prevention and make them accountable.
- Train municipal employees who handle potentially harmful materials in good housekeeping practices.
- Train personnel who use pesticides in the proper use of the pesticides. The California Department of Pesticide Regulation license pesticide dealers, certify pesticide applicators and conduct onsite inspections.
- Train employees and contractors in proper techniques for spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup.
- Keep your Spill Prevention Control and Countermeasure (SPCC) plant up-to-date, and implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- There are no major limitations to this best management practice.
- There are no regulatory requirements to this BMP. Existing regulations already require municipalities to properly store, use, and dispose of hazardous materials

Requirements

Costs

- Minimal cost associated with this BMP. Implementation of good housekeeping practices may result in cost savings as these procedures may reduce the need for more costly BMPs.

Maintenance

- Ongoing maintenance required to keep a clean site. Level of effort is a function of site size and type of activities.

Supplemental Information

Further Detail of the BMP

- The California Integrated Waste Management Board's Recycling Hotline, 1-800-553-2962, provides information on household hazardous waste collection programs and facilities.

Examples

There are a number of communities with effective programs. The most pro-active include Santa Clara County and the City of Palo Alto, the City and County of San Francisco, and the Municipality of Metropolitan Seattle (Metro).

References and Resources

British Columbia Lake Stewardship Society. Best Management Practices to Protect Water Quality from Non-Point Source Pollution. March 2000.
http://www.nalms.org/bclss/bmphome.html#bmp

King County Stormwater Pollution Control Manual - http://dnr.metrokc.gov/wlr/dss/spcm.htm

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities, Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July, 1998, Revised by California Coastal Commission, February 2002.

Orange County Stormwater Program
http://www.ocwatersheds.com/stormwater/swp_introduction.asp

San Mateo STOPPP - (http://stoppp.tripod.com/bmp.html)

Landscape Maintenance SC-73

Objectives

- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	
Bacteria	
Oil and Grease	
Organics	
Oxygen Demanding	☑

Description

Landscape maintenance activities include vegetation removal; herbicide and insecticide application; fertilizer application; watering; and other gardening and lawn care practices. Vegetation control typically involves a combination of chemical (herbicide) application and mechanical methods. All of these maintenance practices have the potential to contribute pollutants to the storm drain system. The major objectives of this BMP are to minimize the discharge of pesticides, herbicides and fertilizers to the storm drain system and receiving waters; prevent the disposal of landscape waste into the storm drain system by collecting and properly disposing of clippings and cuttings, and educating employees and the public.

Approach

Pollution Prevention

- Implement an integrated pest management (IPM) program. IPM is a sustainable approach to managing pests by combining biological, cultural, physical, and chemical tools.
- Choose low water using flowers, trees, shrubs, and groundcover.
- Consider alternative landscaping techniques such as naturescaping and xeriscaping.
- Conduct appropriate maintenance (i.e. properly timed fertilizing, weeding, pest control, and pruning) to help preserve the landscapes water efficiency.

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- Consider grass cycling (grass cycling is the natural recycling of grass by leaving the clippings on the lawn when mowing. Grass clippings decompose quickly and release valuable nutrients back into the lawn).

Suggested Protocols

Mowing, Trimming, and Weeding

- Whenever possible use mechanical methods of vegetation removal (e.g mowing with tractor-type or push mowers, hand cutting with gas or electric powered weed trimmers) rather than applying herbicides. Use hand weeding where practical.
- Avoid loosening the soil when conducting mechanical or manual weed control, this could lead to erosion. Use mulch or other erosion control measures when soils are exposed.
- Performing mowing at optimal times. Mowing should not be performed if significant rain events are predicted.
- Mulching mowers may be recommended for certain flat areas. Other techniques may be employed to minimize mowing such as selective vegetative planting using low maintenance grasses and shrubs.
- Collect lawn and garden clippings, pruning waste, tree trimmings, and weeds. Chip if necessary, and compost or dispose of at a landfill (see waste management section of this fact sheet).
- Place temporarily stockpiled material away from watercourses, and berm or cover stockpiles to prevent material releases to storm drains.

Planting

- Determine existing native vegetation features (location, species, size, function, importance) and consider the feasibility of protecting them. Consider elements such as their effect on drainage and erosion, hardiness, maintenance requirements, and possible conflicts between preserving vegetation and the resulting maintenance needs.
- Retain and/or plant selected native vegetation whose features are determined to be beneficial, where feasible. Native vegetation usually requires less maintenance (e.g., irrigation, fertilizer) than planting new vegetation.
- Consider using low water use groundcovers when planting or replanting.

Waste Management

- Compost leaves, sticks, or other collected vegetation or dispose of at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Place temporarily stockpiled material away from watercourses and storm drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.
- Reduce the use of high nitrogen fertilizers that produce excess growth requiring more frequent mowing or trimming.

- Avoid landscape wastes in and around storm drain inlets by either using bagging equipment or by manually picking up the material.

Irrigation

- Where practical, use automatic timers to minimize runoff.
- Use popup sprinkler heads in areas with a lot of activity or where there is a chance the pipes may be broken. Consider the use of mechanisms that reduce water flow to sprinkler heads if broken.
- Ensure that there is no runoff from the landscaped area(s) if re-claimed water is used for irrigation.
- If bailing of muddy water is required (e.g. when repairing a water line leak), do not put it in the storm drain; pour over landscaped areas.
- Irrigate slowly or pulse irrigate to prevent runoff and then only irrigate as much as is needed.
- Apply water at rates that do not exceed the infiltration rate of the soil.

Fertilizer and Pesticide Management

- Utilize a comprehensive management system that incorporates integrated pest management (IPM) techniques. There are many methods and types of IPM, including the following:
  - Mulching can be used to prevent weeds where turf is absent, fencing installed to keep rodents out, and netting used to keep birds and insects away from leaves and fruit.
  - Visible insects can be removed by hand (with gloves or tweezers) and placed in soapy water or vegetable oil. Alternatively, insects can be sprayed off the plant with water or in some cases vacuumed off of larger plants.
  - Store-bought traps, such as species-specific, pheromone-based traps or colored sticky cards, can be used.
  - Slugs can be trapped in small cups filled with beer that are set in the ground so the slugs can get in easily.
  - In cases where microscopic parasites, such as bacteria and fungi, are causing damage to plants, the affected plant material can be removed and disposed of (pruning equipment should be disinfected with bleach to prevent spreading the disease organism).
  - Small mammals and birds can be excluded using fences, netting, tree trunk guards.
  - Beneficial organisms, such as bats, birds, green lacewings, ladybugs, praying mantis, ground beetles, parasitic nematodes, trichogramma wasps, seed head weevils, and spiders that prey on detrimental pest species can be promoted.
- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.

- Use pesticides only if there is an actual pest problem (not on a regular preventative schedule).
- Do not use pesticides if rain is expected. Apply pesticides only when wind speeds are low (less than 5 mph).
- Do not mix or prepare pesticides for application near storm drains.
- Prepare the minimum amount of pesticide needed for the job and use the lowest rate that will effectively control the pest.
- Employ techniques to minimize off-target application (e.g. spray drift) of pesticides, including consideration of alternative application techniques.
- Fertilizers should be worked into the soil rather than dumped or broadcast onto the surface.
- Calibrate fertilizer and pesticide application equipment to avoid excessive application.
- Periodically test soils for determining proper fertilizer use.
- Sweep pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
- Purchase only the amount of pesticide that you can reasonably use in a given time period (month or year depending on the product).
- Triple rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- Dispose of empty pesticide containers according to the instructions on the container label.

Inspection

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering, and repair leaks in the irrigation system as soon as they are observed.
- Inspect pesticide/fertilizer equipment and transportation vehicles daily.

Training

- Educate and train employees on use of pesticides and in pesticide application techniques to prevent pollution. Pesticide application must be under the supervision of a California qualified pesticide applicator.
- Train/encourage municipal maintenance crews to use IPM techniques for managing public green areas.
- Annually train employees within departments responsible for pesticide application on the appropriate portions of the agency's IPM Policy, SOPs, and BMPs, and the latest IPM techniques.

- Employees who are not authorized and trained to apply pesticides should be periodically (at least annually) informed that they cannot use over-the-counter pesticides in or around the workplace.
- Use a training log or similar method to document training.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup
- Have spill cleanup materials readily available and in a know in location
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- The Federal Pesticide, Fungicide, and Rodenticide Act and California Title 3, Division 6, Pesticides and Pest Control Operations place strict controls over pesticide application and handling and specify training, annual refresher, and testing requirements. The regulations generally cover: a list of approved pesticides and selected uses, updated regularly; general application information; equipment use and maintenance procedures; and record keeping. The California Department of Pesticide Regulations and the County Agricultural Commission coordinate and maintain the licensing and certification programs. All public agency employees who apply pesticides and herbicides in "agricultural use" areas such as parks, golf courses, rights-of-way and recreation areas should be properly certified in accordance with state regulations. Contracts for landscape maintenance should include similar requirements.
- All employees who handle pesticides should be familiar with the most recent material safety data sheet (MSDS) files.
- Municipalities do not have the authority to regulate the use of pesticides by school districts, however the California Healthy Schools Act of 2000 (AB 2260) has imposed requirements on California school districts regarding pesticide use in schools. Posting of notification prior to the application of pesticides is now required, and IPM is stated as the preferred approach to pest management in schools.

Requirements

Costs

Additional training of municipal employees will be required to address IPM techniques and BMPs. IPM methods will likely increase labor cost for pest control which may be offset by lower chemical costs.

Maintenance

Not applicable

Supplemental Information

Further Detail of the BMP

Waste Management

Composting is one of the better disposal alternatives if locally available. Most municipalities either have or are planning yard waste composting facilities as a means of reducing the amount of waste going to the landfill. Lawn clippings from municipal maintenance programs as well as private sources would probably be compatible with most composting facilities

Contractors and Other Pesticide Users

Municipal agencies should develop and implement a process to ensure that any contractor employed to conduct pest control and pesticide application on municipal property engages in pest control methods consistent with the IPM Policy adopted by the agency. Specifically, municipalities should require contractors to follow the agency's IPM policy, SOPs, and BMPs; provide evidence to the agency of having received training on current IPM techniques when feasible; provide documentation of pesticide use on agency property to the agency in a timely manner.

References and Resources

King County Stormwater Pollution Control Manual. Best Management Practices for Businesses. 1995. King County Surface Water Management. July. On-line: http://dnr.metrokc.gov/wlr/dss/spcm.htm

Los Angeles County Stormwater Quality Model Programs. Public Agency Activities http://ladpw.org/wmd/npdes/model_links.cfm

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July. 1998.

Orange County Stormwater Program http://www.ocwatersheds.com/StormWater/swp_introduction.asp

Santa Clara Valley Urban Runoff Pollution Prevention Program. 1997 Urban Runoff Management Plan. September 1997, updated October 2000.

United States Environmental Protection Agency (USEPA). 2002. Pollution Prevention/Good Housekeeping for Municipal Operations Landscaping and Lawn Care. Office of Water. Office of Wastewater Management. On-line: http://www.epa.gov/npdes/menuofbmps/poll_8.htm

Site Design & Landscape Planning SD-10

Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- ☑ Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Each project site possesses unique topographic, hydrologic, and vegetative features, some of which are more suitable for development than others. Integrating and incorporating appropriate landscape planning methodologies into the project design is the most effective action that can be done to minimize surface and groundwater contamination from stormwater.

Approach

Landscape planning should couple consideration of land suitability for urban uses with consideration of community goals and projected growth. Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Design requirements for site design and landscapes planning should conform to applicable standards and specifications of agencies with jurisdiction and be consistent with applicable General Plan and Local Area Plan policies.

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Designing New Installations

Begin the development of a plan for the landscape unit with attention to the following general principles:

- Formulate the plan on the basis of clearly articulated community goals. Carefully identify conflicts and choices between retaining and protecting desired resources and community growth.
- Map and assess land suitability for urban uses. Include the following landscape features in the assessment: wooded land, open unwooded land, steep slopes, erosion-prone soils, foundation suitability, soil suitability for waste disposal, aquifers, aquifer recharge areas, wetlands, floodplains, surface waters, agricultural lands, and various categories of urban land use. When appropriate, the assessment can highlight outstanding local or regional resources that the community determines should be protected (e.g., a scenic area, recreational area, threatened species habitat, farmland, fish run). Mapping and assessment should recognize not only these resources but also additional areas needed for their sustenance.

Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Conserve Natural Areas during Landscape Planning

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Cluster development on least-sensitive portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants.
- Promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

Maximize Natural Water Storage and Infiltration Opportunities Within the Landscape Unit

- Promote the conservation of forest cover. Building on land that is already deforested affects basin hydrology to a lesser extent than converting forested land. Loss of forest cover reduces interception storage, detention in the organic forest floor layer, and water losses by evapotranspiration, resulting in large peak runoff increases and either their negative effects or the expense of countering them with structural solutions.
- Maintain natural storage reservoirs and drainage corridors, including depressions, areas of permeable soils, swales, and intermittent streams. Develop and implement policies and

regulations to discourage the clearing, filling, and channelization of these features. Utilize them in drainage networks in preference to pipes, culverts, and engineered ditches.

- Evaluating infiltration opportunities by referring to the stormwater management manual for the jurisdiction and pay particular attention to the selection criteria for avoiding groundwater contamination, poor soils, and hydrogeological conditions that cause these facilities to fail. If necessary, locate developments with large amounts of impervious surfaces or a potential to produce relatively contaminated runoff away from groundwater recharge areas.

Protection of Slopes and Channels during Landscape Design

- Convey runoff safely from the tops of slopes.
- Avoid disturbing steep or unstable slopes.
- Avoid disturbing natural channels.
- Stabilize disturbed slopes as quickly as possible.
- Vegetate slopes with native or drought tolerant vegetation.
- Control and treat flows in landscaping and/or other controls prior to reaching existing natural drainage systems.
- Stabilize temporary and permanent channel crossings as quickly as possible, and ensure that increases in run-off velocity and frequency caused by the project do not erode the channel.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion. Energy dissipaters shall be installed in such a way as to minimize impacts to receiving waters.
- Line on-site conveyance channels where appropriate, to reduce erosion caused by increased flow velocity due to increases in tributary impervious area. The first choice for linings should be grass or some other vegetative surface, since these materials not only reduce runoff velocities, but also provide water quality benefits from filtration and infiltration. If velocities in the channel are high enough to erode grass or other vegetative linings, riprap, concrete, soil cement, or geo-grid stabilization are other alternatives.
- Consider other design principles that are comparable and equally effective.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define “redevelopment” in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of “ redevelopment” must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under “designing new installations” above should be followed.

Redevelopment may present significant opportunity to add features which had not previously been implemented. Examples include incorporation of depressions, areas of permeable soils, and swales in newly redeveloped areas. While some site constraints may exist due to the status of already existing infrastructure, opportunities should not be missed to maximize infiltration, slow runoff, reduce impervious areas, disconnect directly connected impervious areas.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Stormwater Management Manual for Western Washington, Washington State Department of Ecology, August 2001.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Roof Runoff Controls SD-11

Rain Garden

Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- ☑ Contain Pollutants
- Collect and Convey

Description

Various roof runoff controls are available to address stormwater that drains off rooftops. The objective is to reduce the total volume and rate of runoff from individual lots, and retain the pollutants on site that may be picked up from roofing materials and atmospheric deposition. Roof runoff controls consist of directing the roof runoff away from paved areas and mitigating flow to the storm drain system through one of several general approaches: cisterns or rain barrels; dry wells or infiltration trenches; pop-up emitters, and foundation planting. The first three approaches require the roof runoff to be contained in a gutter and downspout system. Foundation planting provides a vegetated strip under the drip line of the roof.

Approach

Design of individual lots for single-family homes as well as lots for higher density residential and commercial structures should consider site design provisions for containing and infiltrating roof runoff or directing roof runoff to vegetative swales or buffer areas. Retained water can be reused for watering gardens, lawns, and trees. Benefits to the environment include reduced demand for potable water used for irrigation, improved stormwater quality, increased groundwater recharge, decreased runoff volume and peak flows, and decreased flooding potential.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Designing New Installations

Cisterns or Rain Barrels

One method of addressing roof runoff is to direct roof downspouts to cisterns or rain barrels. A cistern is an above ground storage vessel with either a manually operated valve or a permanently open outlet. Roof runoff is temporarily stored and then released for irrigation or infiltration between storms. The number of rain

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barrels needed is a function of the rooftop area. Some low impact developers recommend that every house have at least 2 rain barrels, with a minimum storage capacity of 1000 liters. Roof barrels serve several purposes including mitigating the first flush from the roof which has a high volume, amount of contaminants, and thermal load. Several types of rain barrels are commercially available. Consideration must be given to selecting rain barrels that are vector proof and childproof. In addition, some barrels are designed with a bypass valve that filters out grit and other contaminants and routes overflow to a soak-away pit or rain garden.

If the cistern has an operable valve, the valve can be closed to store stormwater for irrigation or infiltration between storms. This system requires continual monitoring by the resident or grounds crews, but provides greater flexibility in water storage and metering. If a cistern is provided with an operable valve and water is stored inside for long periods, the cistern must be covered to prevent mosquitoes from breeding.

A cistern system with a permanently open outlet can also provide for metering stormwater runoff. If the cistern outlet is significantly smaller than the size of the downspout inlet (say ¼ to ½ inch diameter), runoff will build up inside the cistern during storms, and will empty out slowly after peak intensities subside. This is a feasible way to mitigate the peak flow increases caused by rooftop impervious land coverage, especially for the frequent, small storms.

Dry wells and Infiltration Trenches

Roof downspouts can be directed to dry wells or infiltration trenches. A dry well is constructed by excavating a hole in the ground and filling it with an open graded aggregate, and allowing the water to fill the dry well and infiltrate after the storm event. An underground connection from the downspout conveys water into the dry well, allowing it to be stored in the voids. To minimize sedimentation from lateral soil movement, the sides and top of the stone storage matrix can be wrapped in a permeable filter fabric, though the bottom may remain open. A perforated observation pipe can be inserted vertically into the dry well to allow for inspection and maintenance.

In practice, dry wells receiving runoff from single roof downspouts have been successful over long periods because they contain very little sediment. They must be sized according to the amount of rooftop runoff received, but are typically 4 to 5 feet square, and 2 to 3 feet deep, with a minimum of 1-foot soil cover over the top (maximum depth of 10 feet).

To protect the foundation, dry wells must be set away from the building at least 10 feet. They must be installed in solids that accommodate infiltration. In poorly drained soils, dry wells have very limited feasibility.

Infiltration trenches function in a similar manner and would be particularly effective for larger roof areas. An infiltration trench is a long, narrow, rock-filled trench with no outlet that receives stormwater runoff. These are described under Treatment Controls.

Pop-up Drainage Emitter

Roof downspouts can be directed to an underground pipe that daylights some distance from the building foundation, releasing the roof runoff through a pop-up emitter. Similar to a pop-up irrigation head, the emitter only opens when there is flow from the roof. The emitter remains flush to the ground during dry periods, for ease of lawn or landscape maintenance.

Foundation Planting

Landscape planting can be provided around the base to allow increased opportunities for stormwater infiltration and protect the soil from erosion caused by concentrated sheet flow coming off the roof. Foundation plantings can reduce the physical impact of water on the soil and provide a subsurface matrix of roots that encourage infiltration. These plantings must be sturdy enough to tolerate the heavy runoff sheet flows, and periodic soil saturation.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Supplemental Information

Examples

- City of Ottawa's Water Links Surface –Water Quality Protection Program
- City of Toronto Downspout Disconnection Program
- City of Boston, MA, Rain Barrel Demonstration Program

Other Resources

Hager, Marty Catherine, Stormwater, "Low-Impact Development", January/February 2003. www.stormh2o.com

Low Impact Urban Design Tools, Low Impact Development Design Center, Beltsville, MD. www.lid-stormwater.net

Start at the Source, Bay Area Stormwater Management Agencies Association, 1999 Edition

Efficient Irrigation SD-12

Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Irrigation water provided to landscaped areas may result in excess irrigation water being conveyed into stormwater drainage systems.

Approach

Project plan designs for development and redevelopment should include application methods of irrigation water that minimize runoff of excess irrigation water into the stormwater conveyance system.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Designing New Installations

The following methods to reduce excessive irrigation runoff should be considered, and incorporated and implemented where determined applicable and feasible by the Permittee:

- Employ rain-triggered shutoff devices to prevent irrigation after precipitation.
- Design irrigation systems to each landscape area's specific water requirements.
- Include design featuring flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.
- Implement landscape plans consistent with County or City water conservation resolutions, which may include provision of water sensors, programmable irrigation times (for short cycles), etc.

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- Design timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the storm water drainage system.
- Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. Choose plants with low irrigation requirements (for example, native or drought tolerant species). Consider design features such as:
  - Using mulches (such as wood chips or bar) in planter areas without ground cover to minimize sediment in runoff
  - Installing appropriate plant materials for the location, in accordance with amount of sunlight and climate, and use native plant materials where possible and/or as recommended by the landscape architect
  - Leaving a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible
  - Choosing plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth
- Employ other comparable, equally effective methods to reduce irrigation water runoff.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Storm Drain Signage SD-13

Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- ☑ Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Waste materials dumped into storm drain inlets can have severe impacts on receiving and ground waters. Posting notices regarding discharge prohibitions at storm drain inlets can prevent waste dumping. Storm drain signs and stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets.

Approach

The stencil or affixed sign contains a brief statement that prohibits dumping of improper materials into the urban runoff conveyance system. Storm drain messages have become a popular method of alerting the public about the effects of and the prohibitions against waste disposal.

Suitable Applications

Stencils and signs alert the public to the destination of pollutants discharged to the storm drain. Signs are appropriate in residential, commercial, and industrial areas, as well as any other area where contributions or dumping to storm drains is likely.

Design Considerations

Storm drain message markers or placards are recommended at all storm drain inlets within the boundary of a development project. The marker should be placed in clear sight facing toward anyone approaching the inlet from either side. All storm drain inlet locations should be identified on the development site map.

Designing New Installations

The following methods should be considered for inclusion in the project design and show on project plans:

- Provide stenciling or labeling of all storm drain inlets and catch basins, constructed or modified, within the project area with prohibitive language. Examples include “NO DUMPING

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– DRAINS TO OCEAN" and/or other graphical icons to discourage illegal dumping.

- Post signs with prohibitive language and/or graphical icons, which prohibit illegal dumping at public access points along channels and creeks within the project area.

Note - Some local agencies have approved specific signage and/or storm drain message placards for use. Consult local agency stormwater staff to determine specific requirements for placard types and methods of application.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. If the project meets the definition of "redevelopment", then the requirements stated under " designing new installations" above should be included in all project design plans.

Additional Information

Maintenance Considerations

- Legibility of markers and signs should be maintained. If required by the agency with jurisdiction over the project, the owner/operator or homeowner's association should enter into a maintenance agreement with the agency or record a deed restriction upon the property title to maintain the legibility of placards or signs.

Placement

- Signage on top of curbs tends to weather and fade.

- Signage on face of curbs tends to be worn by contact with vehicle tires and sweeper brooms.

Supplemental Information

Examples

- Most MS4 programs have storm drain signage programs. Some MS4 programs will provide stencils, or arrange for volunteers to stencil storm drains as part of their outreach program.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

19.28.110 EROSION CONTROL LANDSCAPING

Landscaping for the purpose of erosion control shall be in compliance with the standards outlined in Chapter 15 of the Municipal Code.

19.28.120 WATER EFFICIENT LANDSCAPING STANDARDS
(MC 1368 02/08/12)

1. PURPOSE AND INTENT

A. The purpose of this Chapter is to:

(1) Promote the aesthetic and recreational values of landscapes, while recognizing the need to invest water resources as efficiently as possible;

(2) Establish a structure for planning, designing, installing and maintaining water efficient landscapes in new construction and rehabilitated projects;

(3) Establish provisions for water management practices and water waste prevention in the irrigation of existing landscapes;

(4) Implement water quality management practices that minimize storm water and irrigation runoff, to achieve on-site filtration and groundwater recharge;

(5) Promote and encourage the use of low water use plants in landscapes;

(6) Minimize the use of cool season turf;

(7) Promote conservation of potable water by encouraging the use of recycled water and water-conserving technology in landscape irrigation; and

(8) Promote public education about water conservation and water efficient landscape irrigation.

B. The intent of this Chapter is to implement water efficient landscape regulations at least as effective as the state model ordinance adopted pursuant to California Government Code Section 65595.

2. APPLICABILITY

After January 1, 2010, the provisions of this Chapter shall apply as follows:

A. All provisions of this chapter for planning, design, installation and management of new landscapes shall apply to the following new construction and rehabilitation landscape projects normally subject to building or landscaping plan review and permits.

(1) Public agency projects and private development projects with a landscape area equal to or greater than 2,500 square feet;

(2) Developer-installed single-family and multi-family residential projects with a landscape area equal to or greater than 2,500 square feet in the aggregate;

(3) Homeowner-installed and/or homeowner-hired single-family and multifamily residential projects with a total project landscape area equal to or greater than 5,000 square feet.

B. Limited applicability. Existing landscapes, cemeteries and certain Special Landscape Areas are exempt from the provisions of this Chapter as follows:

(1) Existing landscapes installed before January 1, 2010 and exceeding one acre in area are subject only to water waste prevention and efficient irrigation requirements of Sections 19.28.110(12) and 19.28.110(13).

(2) New cemeteries or cemetery expansion projects exceeding 2,500 square feet in landscape area shall be subject to the Water Efficient Landscape worksheet requirement and the irrigation analysis and maintenance requirements of Section 19.28.110(9) and Section 19.28.110(10).

(3) New development or rehabilitation of landscapes including Special Landscape Areas (SLAs), such as edible landscapes, landscapes irrigated with recycled water, and active parks or sport field landscaping shall be subject to the provisions of this Ordinance, except that the Maximum Applies Water Allowance (MAWA) shall be adjusted to provide for adequate irrigation of SLAs.

C. Exemptions. The provisions of this Chapter shall not apply to the following exempt landscapes:

(1) Registered local, state or federal historic sites;

(2) Ecological restoration projects that do not require permanent irrigation systems;

(3) Mined land restoration projects that do not require permanent irrigation systems;

(4) Botanical gardens and arboretums open to the public.

3. LANDSCAPE DESIGN STANDARDS AND PLANNING GUIDELINES

For the efficient use of water, landscapes shall be carefully designed and planned to thrive in local soil and climatic conditions and to suit the intended function of the project. The following design guidelines shall also be considered in landscape planning:

A. Plant Selection:

(1) Native plants and drought-tolerant species are encouraged to promote low maintenance, water efficient landscapes.

(2) Any plant may be used in the landscape, provided that the EAWU (estimated annual applied water use) does not exceed the MAWA (maximum annual applied water allowance).

(3) Plants with similar water use requirements shall be grouped together in "hydrozones" wherever possible.

(4) Turf areas should be minimal, limited mainly to active recreation areas and small lawns. Where turf is used, it should not be planted on slopes greater than 4:1, and warm season varieties are preferred.

(5) Fire resistant plant species and fuel modification requirements shall be top priority for landscape design in high fire hazard areas.

(6) Invasive plant species should be avoided, especially near natural areas, fuel modification zones, parks and water bodies.

(7) The use of mulch is encouraged to retain moisture.

(8) Plant placement shall be planned to create shade in summer and permit solar gain in winter.

(9) Plant size and root characteristics at maturity should be considered in plant selection and placement, to avoid damage to property or infrastructure.

B. Water Features:

(1) Recirculating water systems shall be used for all decorative water features.

(2) If available, recycled water should be used in decorative water features, except pools and spas.

(3) The surface area of a water feature shall be included in MAWA calculation with an evaporation rate equivalent to that of a high water use plant.

(4) Pool and spa covers are highly recommended.

C. Content Requirements of Landscape Design Plans:

(1) Each hydrozone shall be identified as a "low", "moderate", "high", or "mixed" water use zone.

(2) Landscape areas with unique water budget considerations, such as recreation areas, areas dedicated to edible landscapes, and areas to be irrigated with recycled water shall be delineated.

(3) Areas planned for soil amendments, mulch application, surface water features, and hardscapes (pervious and impervious) shall be delineated with applicable notes regarding installation and design.

APPENDIX F

NOISE AND VIBRATION IMPACT ANALYSIS

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IRVINE
LOS ANGELES
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROSEVILLE
SAN LUIS OBISPO

MEMORANDUM

DATE: November 22, 2024

TO: Erik Peterson, Architect, CEDG

FROM: J.T. Stephens, Principal / Noise and Vibration
Moe Abushanab, Noise Engineer

SUBJECT: Noise and Vibration Impact Analysis for the Proposed San Antonio Water Headquarters in Upland, California (LSA Project No. 20241723)

INTRODUCTION AND PROJECT DESCRIPTION

This noise and vibration impact analysis has been prepared to evaluate the potential impacts associated with the proposed San Antonio Water Headquarters (project) in Upland, California. This memorandum is intended to satisfy the City of Upland (City) requirement for a project-specific noise and vibration impact analysis and examines the impacts to the surrounding noise-sensitive uses with the incorporation of project design features and standard conditions. Future noise level impacts are based on the noise measurement data gathered in the vicinity of the project site (from July 16, 2024, to July 17, 2024), modeled traffic volumes from the *Traffic Impact Analysis for the San Antonio Water Headquarters* (LSA 2024), and calculated stationary source noise levels to properly account for the impacts associated with the proposed project.

Location and Description

The approximately 4.92-acre project site is located at 400 East 20th Street in the City of Upland in San Bernardino County (Assessor's Parcel Number 1044-091-22). The project site is located in northwest Upland in an area primarily consisting of residential, commercial, and industrial uses. The project site is bound by East 20th Street to the north, undeveloped open space to the east, State Route 210 (SR 210) to the south, and Flower Court to the west. Figure 1 shows the proposed project location, and Figure 2 shows the site plan. All figures are presented in Attachment B.

The project would result in the construction of a new 3,698-square-foot SAWCO headquarters and associated improvements including a 4,066-square-foot maintenance building, maintenance yard, driveway, parking, solar cover, landscaping, and utility improvements. The headquarters building would feature office space, meeting and conference rooms, a lobby, an archive room, a break room, two Americans with Disabilities Act (ADA) restrooms, a quiet room, a copy room, and a work area. The maintenance building would include storage space, an outdoor welding area, a motor repair room, electrical rooms, an ADA restroom, a locker room, and a maintenance office/break room. The existing water storage tank, pump station, and signal buildings and tower would remain in place.

The buildings would be a maximum height of 23 feet and have a FAR of 0.07. Approximately ten people are expected to be employed on site.

METHODOLOGY

The evaluation of noise impacts associated with the proposed project includes the following:

- A determination of the short-term construction noise and vibration levels at off-site noise-sensitive uses and a comparison to the City's General Plan noise standards and Noise Ordinances within the Municipal Code
- A determination of the long-term noise levels at off-site, noise-sensitive uses as well as the proposed project and comparison of those levels to the City's pertinent noise standards
- If necessary, a determination of required mitigation measures, such as noise barriers and upgraded windows, to reduce long-term noise impacts from all sources

CHARACTERISTICS OF SOUND

Noise is usually defined as unwanted sound. Noise consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, and sleep.

To the human ear, sound has two significant characteristics: pitch and loudness. Pitch is generally an annoyance, while loudness can affect the ability to hear. Pitch is the number of complete vibrations, or cycles per second, of a wave resulting in the tone's range from high to low. Loudness is the strength of a sound that describes a noisy or quiet environment and is measured by the amplitude of the sound wave. Loudness is determined by the intensity of the sound waves combined with the reception characteristics of the human ear. Sound intensity refers to how hard the sound wave strikes an object, which in turn produces the sound's effect. This characteristic of sound can be precisely measured with instruments. The analysis of a project defines the noise environment of the project area in terms of sound intensity and its effect on adjacent sensitive land uses.

Measurement of Sound

Sound intensity is measured through the A-weighted scale to correct for the relative frequency response of the human ear. That is, an A-weighted noise level de-emphasizes low and very high frequencies of sound similar to the human ear's de-emphasis of these frequencies. Unlike linear units (e.g., inches or pounds), decibels are measured on a logarithmic scale representing points on a sharply rising curve.

For example, 10 decibels (dB) is 10 times more intense than 1 dB, 20 dB is 100 times more intense than 1 dB, and 30 dB is 1,000 times more intense than 1 dB. Thirty decibels (30 dB) represents 1,000 times as much acoustic energy as 1 dB. The decibel scale increases as the square of the change, representing the sound pressure energy. A sound as soft as human breathing is about 10 times greater than 0 dB. The decibel system of measuring sound gives a rough connection between the physical intensity of sound and its perceived loudness to the human ear. A 10 dB

increase in sound level is perceived by the human ear as only a doubling of the loudness of the sound. Ambient sounds generally range from 30 dB (very quiet) to 100 dB (very loud).

Sound levels are generated from a source, and their decibel level decreases as the distance from that source increases. Sound dissipates exponentially with distance from the noise source. For a single-point source, sound levels decrease approximately 6 dB for each doubling of distance from the source. This drop-off rate is appropriate for noise generated by stationary equipment. If noise is produced by a line source (e.g., highway traffic or railroad operations), the sound decreases 3 dB for each doubling of distance in a hard site environment. Similarly, line sources with intervening absorptive vegetation or line sources that are located at a great distance to the receptor would decrease 4.5 dB for each doubling of distance.

There are many ways to rate noise for various time periods, but an appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound. The equivalent continuous sound level (L_{eq}) is the total sound energy of time-varying noise over a sample period. However, the predominant rating scales for human communities in the State of California are the L_{eq} and Community Noise Equivalent Level (CNEL) or the day-night average noise level (L_{dn}) based on A-weighted decibels (dBA). CNEL is the time-varying noise over a 24-hour period, with a 5 dBA weighting factor applied to the hourly L_{eq} for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours) and a 10 dBA weighting factor applied to noises occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale but without the adjustment for events occurring during the evening hours. CNEL and L_{dn} are within 1 dBA of each other and are normally interchangeable. The City uses the L_{dn} noise scale for long-term noise impact assessment.

Other noise rating scales of importance when assessing the annoyance factor include the maximum instantaneous noise level (L_{max}), which is the highest exponential time-averaged sound level that occurs during a stated time period. The noise environments discussed in this analysis for short-term noise impacts are specified in terms of maximum levels denoted by L_{max}, which reflects peak operating conditions and addresses the annoying aspects of intermittent noise. It is often used together with another noise scale or noise standards in terms of percentile noise levels in noise ordinances for enforcement purposes. For example, the L_{10} noise level represents the noise level exceeded 10 percent of the time during a stated period. The L_{50} noise level represents the median noise level (i.e., half the time the noise level exceeds this level, and half the time it is less than this level). The L_{90} noise level represents the noise level exceeded 90 percent of the time and is considered the background noise level during a monitoring period. For a relatively constant noise source, the L_{eq} and L_{50} are approximately the same.

Noise impacts can be described in three categories. The first category is audible impacts that refer to increases in noise levels noticeable to humans. Audible increases in noise levels generally refer to a change of 3 dB or greater because this level has been found to be barely perceptible in exterior environments. The second category, potentially audible, refers to a change in the noise level between 1 and 3 dB. This range of noise levels has been found to be noticeable only in laboratory environments. The last category is changes in noise levels of less than 1 dB, which are inaudible to the human ear. Only audible changes in existing ambient or background noise levels are considered potentially significant.

Physiological Effects of Noise

Physical damage to human hearing begins at prolonged exposure to noise levels higher than 85 dBA. Exposure to high noise levels affects the entire system, with prolonged noise exposure in excess of 75 dBA increasing body tensions, thereby affecting blood pressure and functions of the heart and the nervous system. In comparison, extended periods of noise exposure above 90 dBA would result in permanent cell damage. When the noise level reaches 120 dBA, a tickling sensation occurs in the human ear even with short-term exposure. This level of noise is called the threshold of feeling. As the sound reaches 140 dBA, the tickling sensation is replaced by the feeling of pain in the ear. This is called the threshold of pain. A sound level of 160–165 dBA will result in dizziness or loss of equilibrium. The ambient or background noise problem is widespread and generally more concentrated in urban areas than in outlying less developed areas.

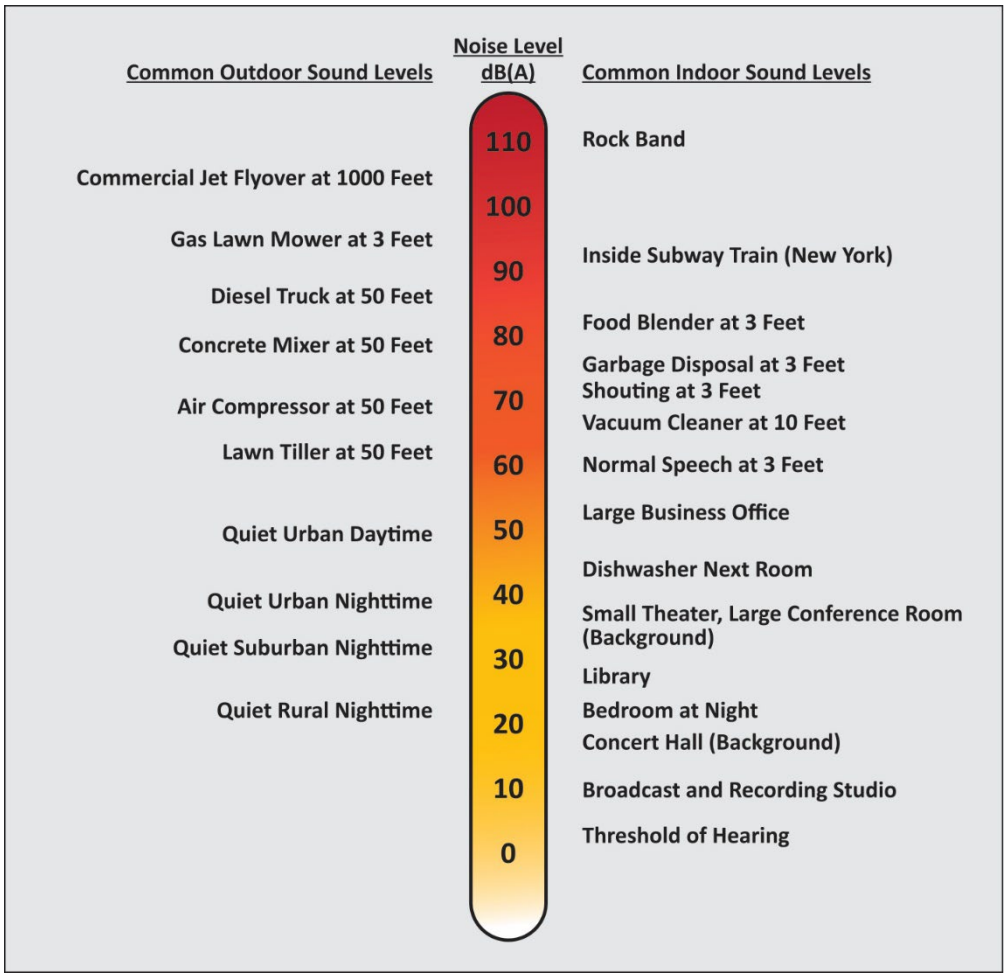
Table A lists full definitions of acoustical terms, and Table B shows common sound levels and their sources.

Table A: Definitions of Acoustical Terms

Term	Definition
Decibel, dB	A unit of level that denotes the ratio between two quantities proportional to power; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
Frequency, Hz	Of a function periodic in time, the number of times that the quantity repeats itself in one second (i.e., number of cycles per second).
A-Weighted Sound Level, dBA	The sound level obtained by use of A-weighting. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this assessment are A-weighted, unless reported otherwise.
L_{01}, L_{10}, L_{50}, L_{90}	The fast A-weighted noise levels equaled or exceeded by a fluctuating sound level for 1 percent, 10 percent, 50 percent, and 90 percent of a stated time period.
Equivalent Continuous Noise Level, L_{eq}	The level of a steady sound that, in a stated time period and at a stated location, has the same A-weighted sound energy as the time-varying sound.
Community Noise Equivalent Level, CNEL	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 5 dB to sound levels occurring in the evening from 7:00 p.m. to 10:00 p.m. and after the addition of 10 dB to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
Day/Night Noise Level, L_{dn}	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 10 dB to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
L_{max}, L_{min}	The maximum and minimum A-weighted sound levels measured on a sound level meter, during a designated time interval, using fast time averaging.
Ambient Noise Level	The all-encompassing noise associated with a given environment at a specified time, usually a composite of sound from many sources at many directions, near and far; no particular sound is dominant.
Intrusive	The noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content, as well as the prevailing ambient noise level.

Source 1: *Technical Noise Supplement* (California Department of Transportation 2013).
Source 2: *Transit Noise and Vibration Impact Assessment Manual* (Federal Transit Administration 2018).

Table B: Common Sound Levels and Noise Sources



Source: LSA (2016).
dBA = A-weighted decibel

CHARACTERISTICS OF VIBRATION

Vibration refers to ground-borne noise and perceptible motion. Ground-borne vibration is almost exclusively a concern inside buildings and is rarely perceived as a problem outdoors, where the motion may not be discernible. Typically, there is more adverse reaction to effects associated with the shaking of a building. Vibration energy propagates from a source through intervening soil and rock layers to the foundations of nearby buildings. The vibration then propagates from the foundation throughout the remainder of the structure. Building vibration may be perceived by occupants as the motion of building surfaces, the rattling of items on shelves or hanging on walls, or a low-frequency rumbling noise. The rumbling noise is caused by the vibration of walls, floors, and ceilings that radiate sound waves. Annoyance from vibration often occurs when the vibration exceeds the threshold of perception by 10 dB or less. This is an order of magnitude below the damage threshold for normal buildings.

Typical sources of ground-borne vibration are construction activities (e.g., blasting, pile driving, and operating heavy-duty earthmoving equipment), steel-wheeled trains, and occasional traffic on rough roads. Problems with both ground-borne vibration and noise from these sources are usually localized to areas within approximately 100 feet of the vibration source, although there are examples of ground-borne vibration causing interference to distances greater than 200 feet (Federal Transit Administration [FTA] 2018). When roadways are smooth, vibration from traffic, even heavy trucks, is rarely perceptible. It is assumed for most projects that the roadway surface will be smooth enough that ground-borne vibration from street traffic will not exceed the impact criteria; however, the construction of a project could result in ground-borne vibration that may be perceptible and annoying.

Ground-borne vibration has the potential to disturb people and damage buildings. Although it is very rare for typical construction activities to cause even cosmetic building damage, it is not uncommon for construction processes such as blasting and pile driving to cause vibration of sufficient amplitudes to damage nearby buildings (FTA 2018). Ground-borne vibration is usually measured in terms of vibration velocity, either the root-mean-square (RMS) velocity or peak particle velocity (PPV). The RMS is best for characterizing human response to building vibration, and PPV is used to characterize potential for damage. Decibel notation acts to compress the range of numbers required to describe vibration. Vibration velocity level in decibels is defined as:

$$L_v = 20 \log_{10} [V/V_{ref}]$$

where L_v is the vibration velocity in decibels (VdB), V is the RMS velocity amplitude, and V_{ref} is the reference velocity amplitude, or 1 x 10^{-6} inches/second (in/sec) used in the United States.

APPLICABLE NOISE STANDARDS

The following information provides standards to which potential noise impacts will be compared. Where exceedances have been identified, impacts are described, and mitigation recommended.

City of Upland General Plan

The Safety Element of the City's General Plan is intended to identify sources of noise and provide goals and policies that ensure that noise from various sources does not create an unacceptable noise environment. Overall, the City's Safety Element describes the noise environment (including noise sources) in the city; addresses noise mitigation regulations, strategies, and programs; and delineates federal, State, and City jurisdiction relative to rail, automotive, aircraft, and nuisance noise.

The City's noise standards correlate with land use zoning classifications to maintain identified ambient noise levels and to limit, mitigate, or eliminate intrusive noise that exceeds the ambient noise levels within a specified zone. As shown in Table C, the City has adopted local guidelines based, in part, on the community noise compatibility guidelines established by the Governor's Office of Planning and Research for use in assessing the compatibility of various land use types with a range of noise levels.

Table C: City of Upland Exterior Noise Compatibility Standards

Land Use Type	Highest Level of Noise Exposure that is Regarded as "Normally Acceptable" (Ldn of CNEL)
Residential – Low Density Single-Family, Duplex, Mobile Homes	60 dBA
Residential – Multi-Family	65 dBA
Mixed-Use	70 dBA
Transient Lodging – Hotels, Motels	65 dBA
Schools, Libraries, Churches, Hospitals, Nursing Homes	70 dBA
Auditoriums, Concert Halls, Amphitheaters	Mitigation based on site-specific study
Sports Arena, Outdoors Spectator Sports	Mitigation based on site-specific study
Playgrounds, Neighborhood Parks	70 dBA
Golf Courses, Riding Stables, Water Recreation, Cemeteries	75 dBA
Office Buildings – Commercial, Office/Professional	70 dBA
Industrial, Manufacturing, Utilities, Agriculture	75 dBA

Source: Governor's Office of Planning and Research, State of California General Plan Guidelines 2003, 2003, pages 244-254.

Source: *General Plan, Safety Element* (City of Upland 2015).
CNEL = Community Noise Equivalent Level
L_{dn} = Day-Night Noise Level
dBA = A-weighted decibel

City of Upland Municipal Code

The City of Upland Municipal Code Chapter 9.40, Unnecessary Noise, limits the noise level generated on a property that can cross to a neighboring property. The City's noise ordinance limits are presented in terms of a 1-hour average sound level and apply to residential uses only. As prescribed in Section 9.40.040, the exterior noise standards for sensitive residential uses are 55 dBA between 7:00 a.m. and 10:00 p.m. (daytime) and 45 dBA between 10:00 p.m. and 7:00 a.m. (nighttime). Ordinance limits generally apply to "stationary" sources such as mechanical equipment, manufacturing activities, or vehicles operating on private property (City of Upland 2024).

Additionally, section 9.40.100 (M) limits construction activities to the hours between 7:00 a.m. and 6:00 p.m. on weekdays (City of Upland 2024).

Federal Transit Administration

Although the City does not have daytime construction noise level limits for activities that occur within the specified hours of the City's Municipal Code, to determine potential California Environmental Quality Act (CEQA) noise impacts, construction noise was assessed using criteria from the *Transit Noise and Vibration Impact Assessment Manual* (FTA Manual) (FTA 2018).

Table D shows the FTA's Detailed Assessment Construction Noise Criteria based on the composite noise levels per construction phase.

Table D: Detailed Assessment Daytime Construction Noise Criteria

Land Use	Daytime 1-hour L_{eq} (dBA)
Residential	80
Commercial	85
Industrial	90

Source: *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018).
dBA = A-weighted decibels
L_{eq} = equivalent continuous sound level

APPLICABLE VIBRATION STANDARDS

The following information provides standards to which potential vibration impacts will be compared. Where exceedances have been identified, impacts are discussed, and mitigation recommended.

Federal Transit Administration

Vibration standards included in the FTA Manual are used in this analysis for ground-borne vibration impacts on human annoyance (FTA 2018). Table E provides the criteria for assessing the potential for interference or annoyance from vibration levels in a building.

Table E: Criteria for Potential Vibration Annoyance

Land Use	Max L_v (VdB)[1]	Description of Use
Workshop	90	Distinctly feelable vibration. Appropriate to workshops and non-sensitive areas.
Office	84	Feelable vibration. Appropriate to offices and non-sensitive areas.
Residential Day	78	Feelable vibration. Appropriate for computer equipment and low-power optical microscopes (up to 20X).
Residential Night and Operating Rooms	72	Vibration not feelable, but ground-borne noise may be audible inside quiet rooms. Suitable for medium-power microscopes (100X) and other equipment of low sensitivity.

Source: *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018).
[1] As measured in 1/3-octave bands of frequency over the frequency range 8 to 80 Hz.
FTA = Federal Transit Administration
Hz = hertz
L_V = velocity in decibels
Max = maximum
VdB = vibration velocity decibels

The criteria for environmental impacts resulting from ground-borne vibration and noise are based on the maximum levels for a single event. The City's Municipal Code does not include specific criteria for assessing vibration impacts associated with damage. Therefore, for the purpose of determining the significance of vibration impacts experienced at sensitive uses surrounding the project site, the guidelines within the 2018 FTA Manual have been used to determine vibration impacts (refer to Table F, below).

Table F: Construction Vibration Damage Criteria

Building Category	PPV (in/sec)
Reinforced concrete, steel, or timber (no plaster)	0.50
Engineered concrete and masonry (no plaster)	0.30
Non-engineered timber and masonry buildings	0.20
Buildings extremely susceptible to vibration damage	0.12

Source: *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018).
FTA = Federal Transit Administration
in/sec = inches per second
PPV = peak particle velocity

The FTA Manual (2018) guidelines show that a vibration level of up to 0.2 in/sec in PPV is considered safe for non-engineered timber and masonry buildings and would not result in any construction vibration damage. Therefore, in order to be conservative, the 0.2 in/sec in the PPV threshold has been used when evaluating vibration impacts at the nearest structures to the site.

THRESHOLDS OF SIGNIFICANCE

Based on *Guidelines for the Implementation of the California Environmental Quality Act* (*State CEQA Guidelines*), Appendix G, Public Resources Code, Sections 15000–15387, a project will normally have a significant effect on the environment related to noise if it will substantially increase the ambient noise levels for adjoining areas or conflict with adopted environmental plans and the goals of the community in which it is located.

The *State CEQA Guidelines* indicate that a project would have a significant impact on noise if it would result in:

- Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Generation of excessive ground-borne vibration or ground-borne noise levels; or
- For a project located within the vicinity of a private airstrip or 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, expose people residing or working in the project area to excessive noise levels.

OVERVIEW OF THE EXISTING NOISE ENVIRONMENT

The primary existing noise sources in the project area are transportation facilities, including SR 210 to the south. To assess the existing noise conditions in the area, long-term noise measurements were conducted at the project site. Two long-term, 24-hour measurements were taken from July 16, 2024, to July 17, 2024. The locations of the noise measurements are shown on Figure 3, and the results are summarized in Table G. Noise measurement data information is provided in Attachment C of this analysis.

Table G: Existing Noise Level Measurements

Location Number	Location Description	Daytime Noise Levels[1] (dBA L_{eq})	Evening Noise Levels[2] (dBA L_{eq})	Nighttime Noise Levels[3] (dBA L_{eq})	Average Daily Noise Levels (dBA CNEL)
LT-1	On a light pole at the end of 20th Street across from the northeastern corner of the project site, approximately 490 feet away from the SR 210 centerline and 355 feet away from the North Campus Avenue centerline	59.8–67.4	60.6–61.9	57.9–64.9	68.1
LT-2	On a light pole across from the southwestern corner of the project site, approximately 175 feet away from the SR 210 centerline.	63.4–68.9	63.6–64.4	61.1–65.0	70.1

Source: Compiled by LSA (2024).
[1] Daytime Noise Levels = noise levels during the hours of 7:00 a.m. to 7:00 p.m.
[2] Evening Noise Levels = noise levels during the hours of 7:00 p.m. to 10:00 p.m.
[3] Nighttime Noise Levels = noise levels during the hours of 10:00 p.m. to 7:00 a.m.
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
ft = foot/feet
L_{eq} = equivalent continuous sound level

Sensitive Land Uses in the Project Vicinity

Certain land uses are considered more sensitive to noise than others. Examples of these include residential areas, educational facilities, hospitals, childcare facilities, and senior housing. The project site is surrounded primarily by residential uses to the west. Land uses adjacent to the project site include the following:

- **North:** Existing single-family homes opposite East 20th Street, approximately 95 feet from the project site property line.
- **East:** Undeveloped open space.
- **South:** SR 210.
- **West:** Existing single-family homes opposite Flower Court, approximately 60 feet from the project site property line.

Aircraft Noise

The project site is approximately 2.6 miles northeast of Cable Airport. Noise impacts related to aircraft operations may contribute to the aircraft noise in the project area; however, the project site is located well outside of the 60 dBA CNEL contour. Because the project site and surrounding

sensitive uses are all outside of the 60 dBA CNEL contours of airports in the vicinity, no further analysis is necessary.

PROJECT IMPACT ANALYSIS

The proposed project would result in short-term construction noise and vibration impacts and long-term mobile source noise and vibration impacts, as described below.

Short-Term Construction-Related Impacts

Project construction would result in short-term noise and vibration impacts on adjacent land uses. Maximum construction impacts would be short-term, generally intermittent depending on the construction phase and variable depending on receiver distance from the active construction zone. The duration of impacts generally would be from 1 day to several weeks depending on the phase of construction. The following describes the level and types of impacts that would occur during construction.

Construction Noise Impacts

Two types of short-term noise impacts could occur during the construction of the proposed project. First, construction crew commutes and the transport of construction equipment and materials to the site for the proposed project would incrementally increase noise levels on access roads leading to the site. Although there would be a relatively high single-event noise-exposure potential causing intermittent noise nuisance (passing trucks at 50 feet would generate up to 84 dBA L_{max}), the effect on longer-term ambient noise levels would be small compared to existing daily traffic volumes on East 20th Street. The results of the California Emissions Estimator Model (CalEEMod) for the proposed project indicate during the paving phase an additional 39 passenger car equivalent (PCE) vehicles, composed of worker and hauling trips, would be added to the adjacent roadway to the project site. Based on the *Traffic Impact Analysis* (LSA 2024) the existing traffic volume on East 20th Street, assumed to be the main construction access, is 80 vehicles. The expected traffic noise level increase would be approximately 1.7 dBA. A noise level increase of less than 3 dBA would not be perceptible to the human ear in an outdoor environment. Therefore, short-term, construction-related impacts associated with worker commute and equipment transport to the project site would be less than significant.

The second type of short-term noise impact is related to noise generated during construction, which includes site preparation, grading, building construction, paving, and architectural coating on the project site. Construction is completed in discrete steps, each of which has its own mix of equipment and, consequently, its own noise characteristics. These various sequential phases would change the character of the noise generated on the site and, therefore, the noise levels surrounding the site as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase. Table H lists typical construction equipment noise levels recommended for noise impact assessments, based on a distance of 50 feet between the equipment and a noise receptor, taken from the Federal Highway Administration (FHWA) *Roadway Construction Noise Model* (FHWA 2006).

In addition to the reference maximum noise level, the usage factor provided in Table H is used to calculate the hourly noise level impact for each piece of equipment based on the following equation:

$$L_{eq}(equip) = E.L. + 10\log(U.F.) - 20\log\left(\frac{D}{50}\right)$$

where: $L_{eq}(equip)$ = L_{eq} at a receiver resulting from the operation of a single piece of equipment over a specified time period.

E.L. = noise emission level of the particular piece of equipment at a reference distance of 50 feet.

U.F. = usage factor that accounts for the fraction of time that the equipment is in use over the specified period of time.

D = distance from the receiver to the piece of equipment.

Table H: Typical Construction Equipment Noise Levels

Equipment Description	Acoustical Usage Factor (%)[1]	Maximum Noise Level (L_{max}) at 50 Feet[2]
Auger Drill Rig	20	84
Backhoes	40	80
Compactor (ground)	20	80
Compressor	40	80
Cranes	16	85
Dozers	40	85
Dump Trucks	40	84
Excavators	40	85
Flat Bed Trucks	40	84
Forklift	20	85
Front-end Loaders	40	80
Graders	40	85
Impact Pile Drivers	20	95
Jackhammers	20	85
Paver	50	77
Pickup Truck	40	55
Pneumatic Tools	50	85
Pumps	50	77
Rollers	20	85
Scrapers	40	85
Tractors	40	84
Trencher	50	80
Welder	40	73

Source: FHWA Roadway Construction Noise Model User's Guide, Table 1 (FHWA 2006).

Note: Noise levels reported in this table are rounded to the nearest whole number.

[1] Usage factor is the percentage of time during a construction noise operation that a piece of construction equipment is operating at full power.

[2] Maximum noise levels were developed based on Specification 721.560 from the Central Artery/Tunnel program to be consistent with the City of Boston's Noise Code for the "Big Dig" project.

FHWA = Federal Highway Administration

L_{max} = maximum instantaneous sound level

Each piece of construction equipment operates as an individual point source. Using the following equation, a composite noise level can be calculated when multiple sources of noise operate simultaneously:

$$Leq\ (composite) = 10 * \log_{10}\left(\sum_{1}^{n} 10^{\frac{Ln}{10}}\right)$$

Using the equations from the methodology above, the reference information in Table H, and the construction equipment list provided, the composite noise level of each construction phase was calculated. The project construction composite noise levels at a distance of 50 feet would range from 74 dBA L_{eq} to 86 dBA L_{eq}, with the highest noise levels occurring during the grading phase.

Once composite noise levels are calculated, reference noise levels can then be adjusted for distance using the following equation:

$$Leq\ (at\ distance\ X) = Leq\ (at\ 50\ feet) - 20 * \log_{10}\left(\frac{X}{50}\right)$$

In general, this equation shows that doubling the distance would decrease noise levels by 6 dBA while halving the distance would increase noise levels by 6 dBA.

Table I shows the nearest sensitive uses to the project site, their distance from the center of construction activities, and composite noise levels expected during construction. These noise level projections do not consider intervening topography or barriers. Construction equipment calculations are provided in Attachment D.

Table I: Potential Construction Noise Impacts at Nearest Receptor

Receptor (Location)	Composite Noise Level (dBA L_{eq}) at 50 feet[1]	Distance (feet)	Composite Noise Level (dBA L_{eq})
Residential (North)	86	250	72
Residential (West)		405	68

Source: Compiled by LSA (2024).

[1] The composite construction noise level represents the grading phase which is expected to result in the greatest noise level as compared to other phases.

dBA L_{eq} = average A-weighted hourly noise level

While construction noise will vary, it is expected that composite noise levels during construction at the nearest sensitive residential uses to the north and west would approach 72 dBA L_{eq} and 68 dBA L_{eq}, respectively, during daytime hours. These predicted noise levels would only occur when all construction equipment is operating simultaneously and, therefore, are assumed to be rather conservative in nature. While construction-related short-term noise levels have the potential to be higher than existing ambient noise levels in the project area under existing conditions, the noise impacts would no longer occur once project construction is completed.

As stated above, the City's Noise Ordinance regulates noise impacts associated with construction activities. The proposed project would comply with the construction hours specified in the City's

Noise Ordinance, which states that construction activities are allowed between the hours of 7:00 a.m. and 6:00 p.m. on weekdays (City of Upland 2024).

As it relates to off-site uses, construction-related noise impacts would remain below the 80 dBA L_{eq} 1-hour construction noise level criteria for daytime construction noise level criteria as established by the FTA for residential land uses; therefore, the impact would be considered less than significant.

Construction Vibration Building Damage Potential

Ground-borne noise and vibration from construction activity would be mostly low. Table J provides reference PPV values and vibration levels (in terms of VdB) from typical construction vibration sources at 25 feet. Although the specific pieces of equipment that would be used on the site are unknown at this time, to provide an analysis of potential vibration levels expected for a project of this size, a large bulldozer would generate 0.089 PPV (in/sec) of ground-borne vibration when measured at 25 feet, based on the FTA Manual (FTA 2018). As shown in Table F, it would take a minimum of 0.2 PPV (in/sec) to cause any potential building damage to non-engineered timber and masonry buildings.

Table J: Vibration Source Amplitudes for Construction Equipment

Equipment	Reference PPV/L_V at 25 ft	
	PPV (in/sec)	L_V (VdB)[1]
Hoe Ram	0.089	87
Large Bulldozer	0.089	87
Caisson Drilling	0.089	87
Loaded Trucks	0.076	86
Jackhammer	0.035	79
Small Bulldozer	0.003	58

Source: *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018).

[1] RMS VdB re 1 µin/sec.

µin/sec = micro-inches per second
ft = foot/feet
FTA = Federal Transit Administration
in/sec = inches per second
L_V = velocity in decibels
PPV = peak particle velocity
RMS = root-mean-square
VdB = vibration velocity in decibels

The distance to the nearest buildings for vibration impact analysis is measured between the nearest off-site buildings and the project construction boundary (assuming the construction equipment would be used at or near the project setback line). The formula for vibration transmission is provided below:

$$L_vdB\ (D) = L_vdB\ (25\ feet) - 30\ Log\ (D/25)$$

$$PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$$

The closest structures, which are associated with the residential uses to the west, are approximately 60 feet from the western project construction boundary. Using the reference data from Table J and the equation above, it is expected that vibration levels generated by dump trucks and other large equipment would generate ground-borne vibration levels of up to 0.024 PPV (in/sec) at the closest

structure to the project site. This vibration level would not exceed the 0.2 in/sec PPV threshold considered safe for non-engineered timber and masonry buildings. Therefore, construction would not result in any vibration damage, impacts would be less than significant, and no mitigation is required.

Construction Vibration Human Annoyance Potential

As stated above, the existing residences, located approximately 250 feet to the north from the center of the project site, is the nearest sensitive receptor and would experience vibration levels approaching 57 VdB based on the following equation:

$$L_v dB\ (D) = L_v dB\ (25\ feet) - 30\ Log\ (D/25)$$

Based on the standards provided in Table E, this level of ground-borne vibration is below the threshold of distinctly perceptible, which is approximately 72 VdB for frequent events at uses where people sleep and would not exceed the FTA vibration threshold for human annoyance at the nearest sensitive use, and project construction would not result in vibration levels that would typically result in human annoyance. Therefore, this level of ground-borne vibration would be less than significant for human annoyance. No mitigation is required.

Long-Term Off-Site Traffic Noise Impacts

The guidelines included in the FHWA Highway Traffic Noise Prediction Model (FHWA-RD-77 108) were used to evaluate highway traffic-related noise conditions along roadway segments in the project vicinity. This model requires various parameters, including traffic volumes, vehicle mix, vehicle speed, and roadway geometry to compute typical equivalent noise levels during daytime, evening, and nighttime hours. The resultant noise levels are weighted and summed over 24-hour periods to determine the CNEL values. Table K provides the traffic noise levels for the opening year and horizon year with and without project scenarios. These noise levels represent the worst-case scenario, which assumes no shielding is provided between the traffic and the location where the noise contours are drawn.

The without and with project scenario traffic volumes were obtained from *Traffic Impact Analysis for the San Antonio Water Headquarters* (LSA 2024). Attachment E provides the specific assumptions used in developing these noise levels and model printouts. Although Table K shows that the increase in project-related traffic noise would be greater than 3 dBA, which is perceptible to the human ear in an outdoor environment, the generated CNEL noise levels would be below 60 dBA CNEL, which is acceptable for low-density residential uses as specified in the City's General Plan. Therefore, traffic noise impacts from project-related traffic on off-site sensitive receptors would be less than significant, and no mitigation measures are required.

Long-Term Ground-Borne Noise and Vibration from Vehicular Traffic

The proposed project would not generate noticeable vibration levels related to on-site operations. Trucks traveling to and from the project site as well as loading and unloading activities may generate vibration levels. However, the closest off-site uses are greater than 25 feet away and vibration levels generated from trucks would not be perceptible. In addition, vibration levels generated from

project-related traffic on the adjacent roadways are unusual for on-road vehicles because the rubber tires and suspension systems of on-road vehicles provide vibration isolation. Based on a reference vibration level of 0.089 in/sec PPV, structures greater than 25 feet from the roadways that contain project trips would experience vibration levels below the most conservative standard of 0.12 in/sec PPV; therefore, vibration levels generated from project-related traffic on the adjacent roadways would be less than significant, and no mitigation measures are required.

Table K: Traffic Noise Levels Without and With Proposed Project

Roadway Segment	Existing		Existing – With Project			Opening Year (2027)		Opening Year (2027) – With Project		
	ADT	CNEL (dBA) 50 ft from Centerline of Outermost Lane	ADT	CNEL (dBA) 50 ft from Centerline of Outermost Lane	Increase from Baseline Conditions (dBA)	ADT	CNEL (dBA) 50 ft from Centerline of Outermost Lane	ADT	CNEL (dBA) 50 ft from Centerline of Outermost Lane	Increase from Baseline Conditions (dBA)
20th Street West of Winston Court	80	42.4	190	46.1	3.7	100	43.4	210	46.6	3.2
20th Street East of Winston Court	0	23.4	30	38.1	14.7	0	23.4	30	38.1	14.7
20th Street East of Campus Avenue	7,910	62.0	8,070	62.0	0.0	8,570	62.3	8,730	62.4	0.1
Campus Avenue North of 20th Street	7,910	63.8	7,910	63.8	0.0	8,540	64.1	8,540	64.1	0.0

Source: Compiled by LSA (2024).
Note: Shaded cells indicate roadway segments adjacent to the project site.
ADT = average daily traffic dBA = A-weighted decibels
CNEL = Community Noise Equivalent Level ft= foot/feet

Table K: Traffic Noise Levels Without and With Proposed Project (Continued)

Roadway Segment	Horizon Year (2050)		Horizon Year (2050) – With Project		
	ADT	CNEL (dBA) 50 ft from Centerline of Outermost Lane	ADT	CNEL (dBA) 50 ft from Centerline of Outermost Lane	Increase from Baseline Conditions (dBA)
20th Street West of Winston Court	100	43.4	210	46.6	3.2
20th Street East of Winston Court	0	23.4	30	38.1	14.7
20th Street East of Campus Avenue	9,290	62.6	9,450	62.7	0.1
Campus Avenue North of 20th Street	9,260	64.4	9,260	64.4	0.0

Source: Compiled by LSA (2024).
Note: Shaded cells indicate roadway segments adjacent to the project site.
ADT = average daily traffic dBA = A-weighted decibels
CNEL = Community Noise Equivalent Level ft= foot/feet

Long-Term Off-Site Operational Noise Impacts

Adjacent off-site land uses would be potentially exposed to stationary-source noise impacts from rooftop heating, ventilation, and air conditioning (HVAC) equipment and proposed truck arrival and departure activities. The potential noise impacts to off-site sensitive land uses from the proposed operations are discussed below.

Heating, Ventilation, and Air Conditioning Equipment

The project would have various rooftop mechanical equipment, including HVAC units, atop the proposed buildings. Based on the project site plan, the project is assumed to have two rooftop HVAC units atop each proposed building (Main Building and Maintenance Building) and assumed to operate 24 hours per day. The HVAC equipment could operate 24 hours per day and would generate sound power levels (L_w) of up to 87 dBA L_w or 72 dBA L_{eq} at 5 feet, based on manufacturer data (Trane n.d.).

Truck Arrival and Departure Activities

Noise levels generated by delivery trucks would be similar to noise readings from truck loading and unloading activities, which generate a noise level of 75 dBA L_{eq} at 20 feet based on measurements taken by LSA (*Operational Noise Impact Analysis for Richmond Wholesale Meat Distribution Center* [LSA 2016]). Shorter term noise levels that occur during the docking process taken by LSA for the *Operational Noise Impact Analysis for Richmond Wholesale Meat Distribution Center* were measured to be 76.3 dBA L_8 at 20 feet. These noise level measurements are relevant to the project because delivery trucks are anticipated during operation of the project. Delivery trucks would arrive on site and maneuver their trailers so that trailers would be parked within the loading docks. During this process, noise levels are associated with the truck engine noise, air brakes, and back-up alarms while the truck is backing into the dock. These noise levels would occur for a shorter period of time (less than 5 minutes). After a truck enters the loading dock, the doors would be closed, and the remainder of the truck loading activities would be enclosed and therefore much less perceptible. Consistent with the *Traffic Impact Analysis for the San Antonio Water Company Headquarters Project* (LSA 2024), it is assumed that truck arrivals and departure activities could occur at 6 parking spaces during peak hour for a period of less than 5 minutes each.

Cumulative Operations Noise Assessment

Tables L and M below show the combined hourly noise levels generated by HVAC equipment and truck delivery activities at the closest off-site land uses. The results indicated that operational noise levels would be below the daytime hourly noise level standards of 55 dBA L_{eq} for residential uses. Although the operational noise levels may exceed the nighttime hourly noise level standards of 45 dBA L_{eq}, ambient noise levels would not increase by 5 dBA or more. Therefore, operations of the proposed project would be less than significant. No mitigation is required. Attachment F presents the operational noise source calculations.

Table L: Daytime Exterior Noise Level Impacts

Receptor	Direction	Existing Quietest Daytime Noise Level (dBA L_{eq})	Project Generated Noise Levels (dBA L_{eq})	Potential Operational Noise Impact?[1]
Residential	North	59.8	47.0	No
Residential	West	63.4	46.7	No

Source: Compiled by LSA (2024).

[1] A potential operational noise impact would occur if (1) the quietest daytime ambient hour is less 55 dBA L_{eq} at the nearest residential uses and project noise impacts are greater 55 dBA L_{eq} at the nearest residential uses, or (2) the quietest daytime ambient hour is greater than 55 dBA L_{eq} at the nearest residential uses and project noise impacts are 3 dBA greater than the quietest daytime ambient hour.

dBA L_{eq} = average A-weighted hourly noise level

Table M: Nighttime Exterior Noise Level Impacts

Receptor	Direction	Existing Quietest Nighttime Noise Level (dBA L_{eq})	Project Generated Noise Levels (dBA L_{eq})	Potential Operational Noise Impact?[1]
Residential	North	57.9	47.0	No
Residential	West	61.1	46.7	No

Source: Compiled by LSA (2024).

[1] A potential operational noise impact would occur if (1) the quietest nighttime ambient hour is less 45 dBA L_{eq} at the nearest residential uses and project noise impacts are greater than 45 dBA L_{eq} at the nearest residential uses, or (2) the quietest nighttime ambient hour is greater than 45 dBA L_{eq} at the nearest residential uses and project noise impacts are 3 dBA greater than the quietest nighttime ambient hour.

dBA L_{eq} = average A-weighted hourly noise level

In conclusion, the proposed project would not generate noise levels from operations above the quietest ambient noise levels during daytime and nighttime hours. Furthermore, due to the relatively high ambient noise levels, the project would not contribute to the overall ambient noise levels. The project is also not anticipated to generate vibration levels above the FTA limits to off-site receptors with the implementation of project design features that limit the location of heavy equipment operations. Therefore, the proposed project would comply with the City's noise and vibration standards, and no noise reduction features are required.

Attachments:
- A: References
- B: Figures
- C: Noise Measurement Data
- D: Construction Noise Calculations
- E: FHWA Traffic Noise Printouts
- F: Operational Noise Level Calculations

ATTACHMENT A

REFERENCES

City of Upland. 2015. *General Plan, Safety Element.* September.

_____. 2024. *Municipal Code, Noise Ordinances.* March 13.

Federal Highway Administration (FHWA). 2006. *Roadway Construction Noise Model User's Guide.* January. Washington, D.C. Website: https://www.fhwa.dot.gov/environment/noise/construction_noise/rcnm/rcnm.pdf (accessed November 2024).

Federal Transit Administration (FTA). 2018. *Transit Noise and Vibration Impact Assessment Manual* (FTA Manual). FTA Report 0123. Office of Planning and Environment. September.

LSA Associates, Inc. (LSA). 2016. *Operational Noise Impact Analysis for Richmond Wholesale Meat Distribution Center.*

_____. 2024. *Traffic Impact Analysis for the San Antonio Water Headquarters.*

Trane. n.d. *Fan Performance - Product Specifications RT-PRC023AU-EN.*

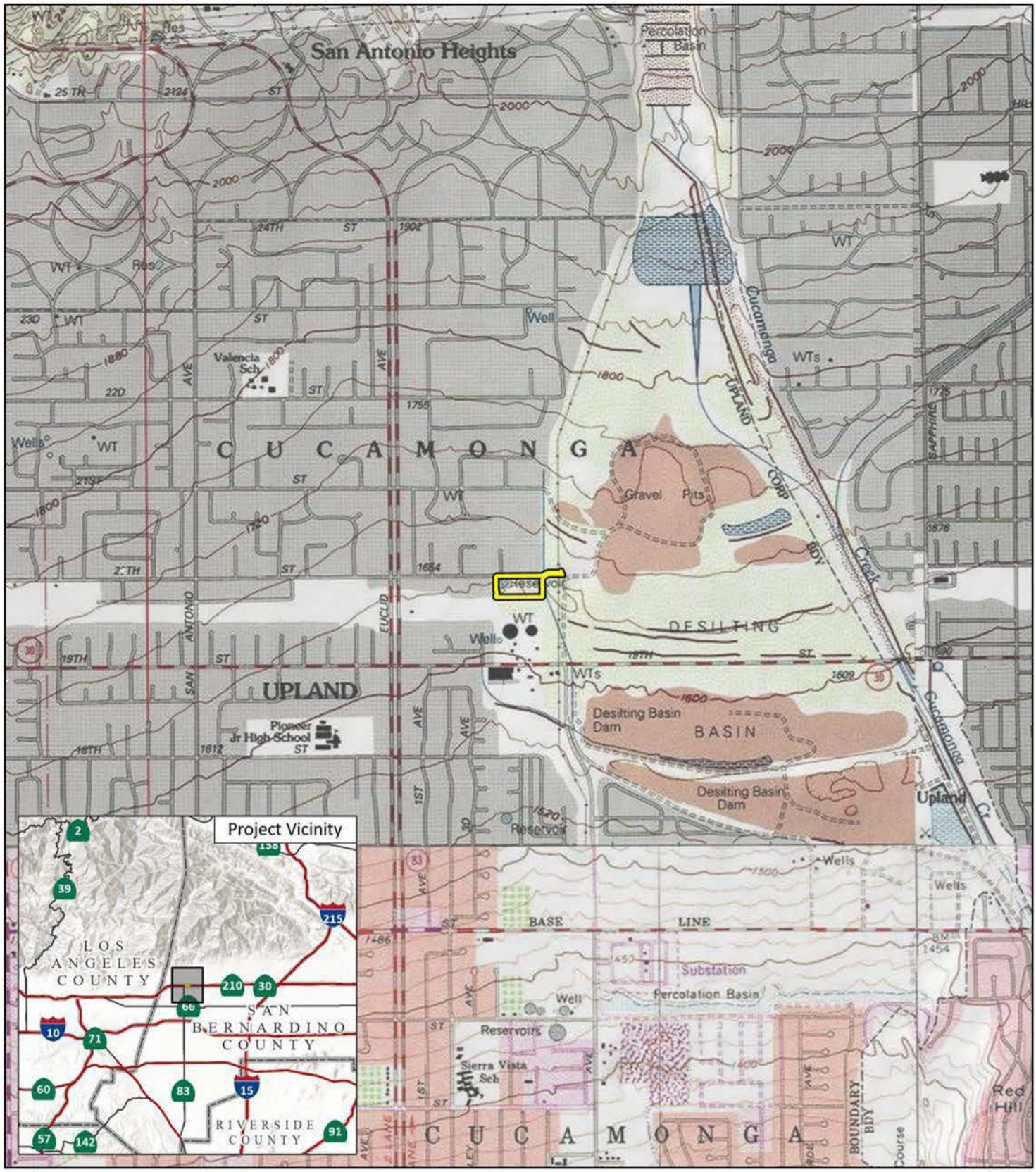
ATTACHMENT B

FIGURES

Figure 1: Project Location

Figure 2: Conceptual Site Plan

Figure 3: Noise Monitoring Locations



LSA

FIGURE 1

0 1000 2000
FEET

San Antonio Water Company Headquarters

Project Location and Vicinity

SOURCE: *Mt. Baldy CA*, 7.5' Quad (USGS 1988)

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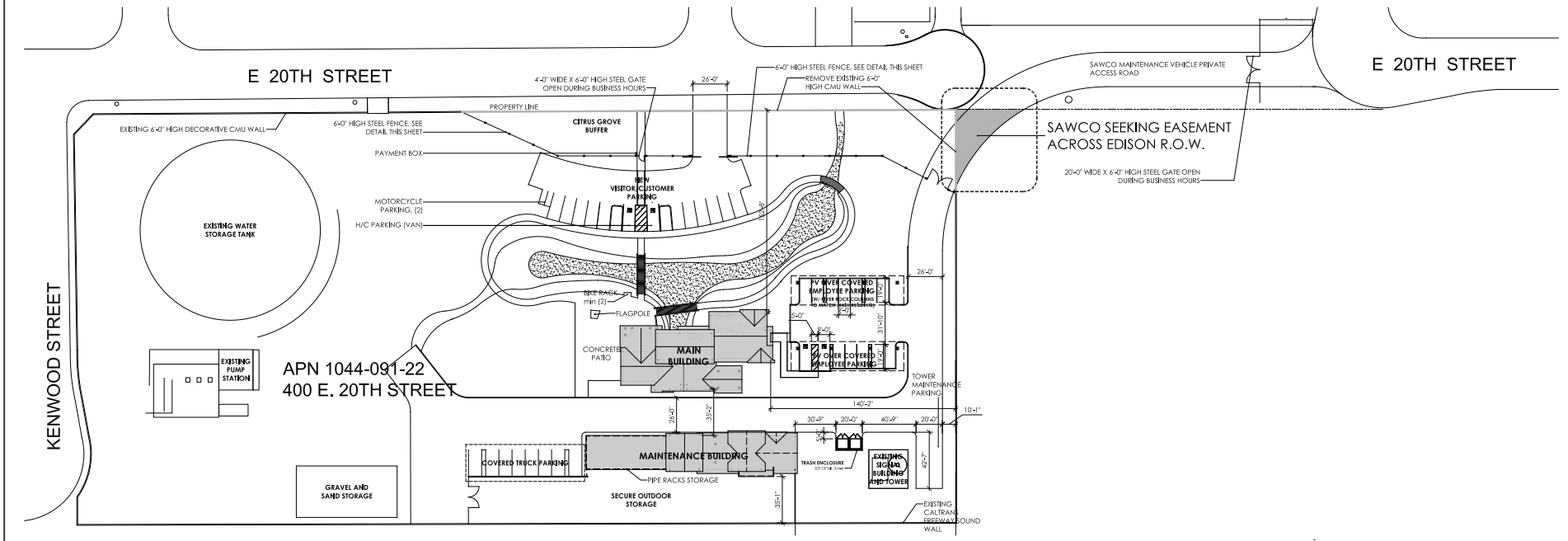

LSA

FIGURE 2

N

0 60 120

FEET

SOURCE: CEDG, Inc.

San Antonio Water Company Headquarters

Conceptual Site Plan

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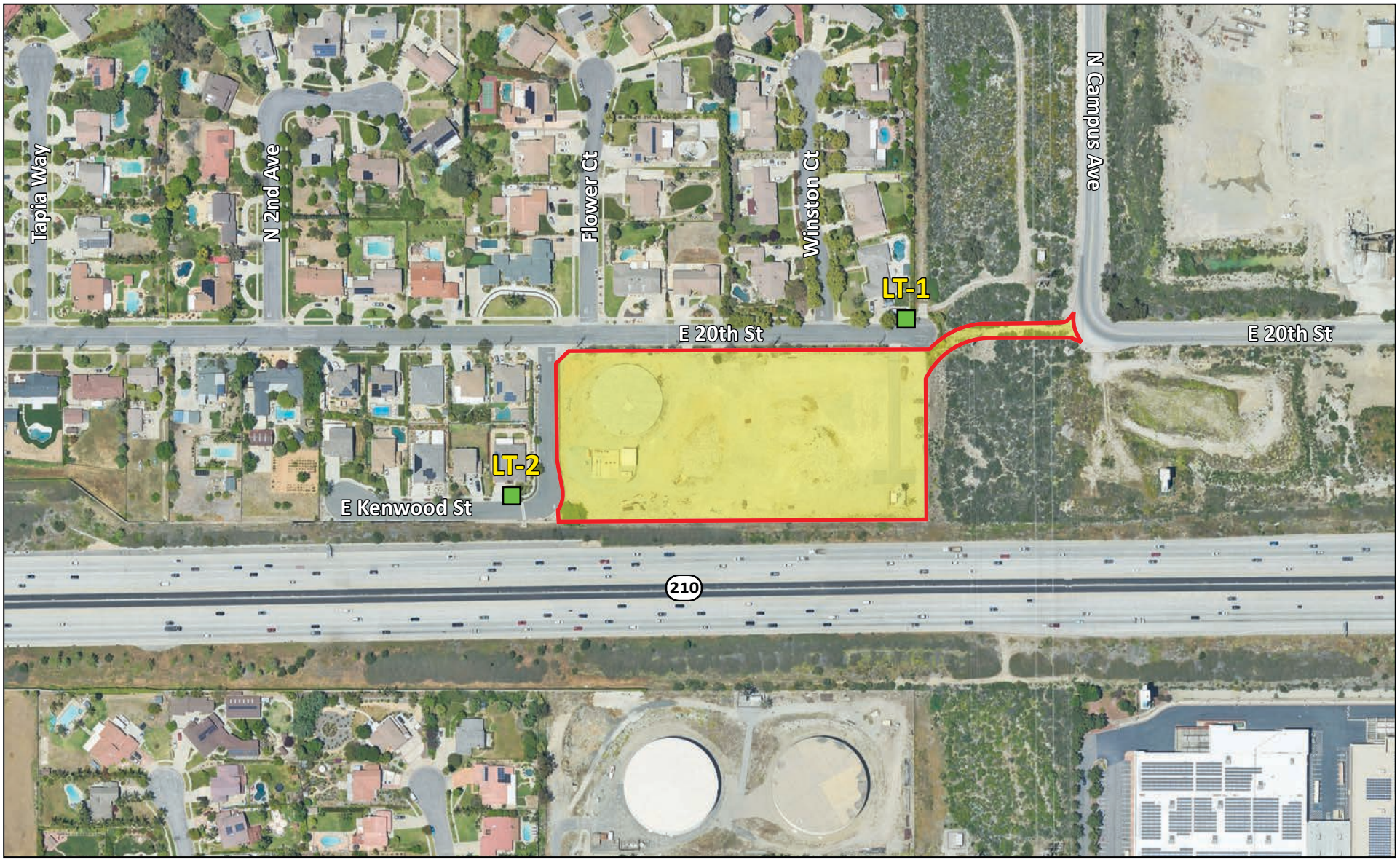

LSA

LEGEND

Project Site Boundary

LT-1 Long-term Noise Monitoring Location

FIGURE 3

0 125 250

FEET

SOURCE: Google Earth 2024

San Antonio Water Company Headquarters

Noise Monitoring Locations

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ATTACHMENT C

NOISE MEASUREMENT DATA

Noise Measurement Survey – 24 HR

Project Number: 20241723
Project Name: San Antonio

Test Personnel: Amber Hazelrigg
Equipment: Spark 706RC (SN: 18517)

Site Number: LT-1 Date: 7/16/24

Time: From 12pm To 12pm

Site Location: The monitor was hung on a light pole at the end of 20th street across from the northeastern side of the project site. It is approximately 490 feet to the 210 Freeway centerline and 355 feet to North Campus Avenue centerline.

Primary Noise Sources: The primary noise would be residential.

Comments:

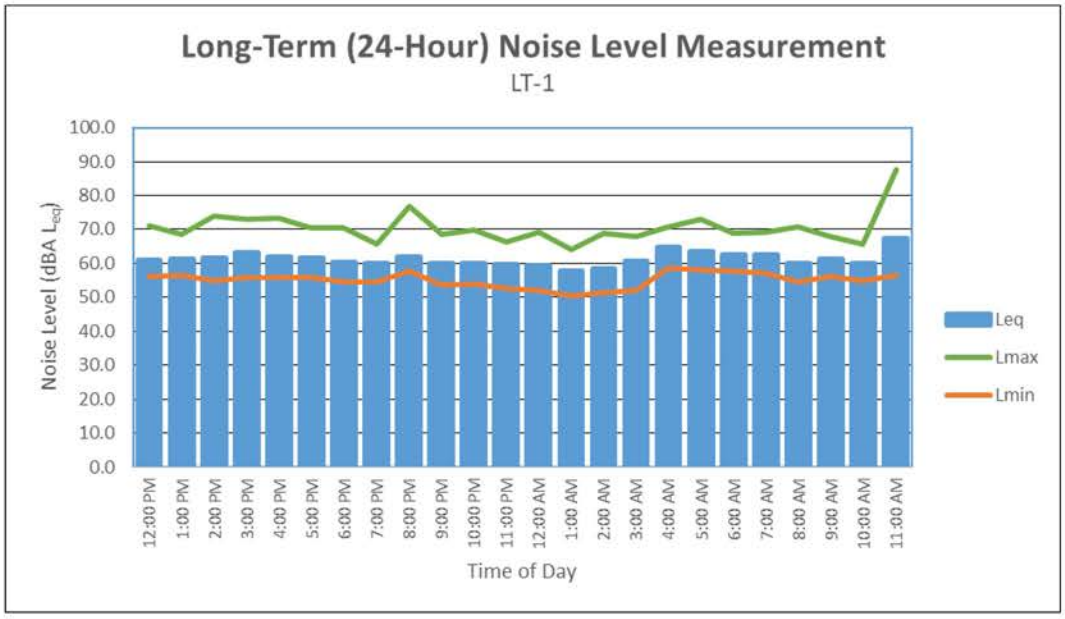
Photo:

Long-Term (24-Hour) Noise Level Measurement Results at LT-1

Start Time	Date	Noise Level (dBA)		
		L_{eq}	L_{max}	L_{min}
12:00 PM	7/16/24	60.8	71.0	56.1
1:00 PM	7/16/24	61.3	68.4	56.4
2:00 PM	7/16/24	61.5	74.0	55.0
3:00 PM	7/16/24	63.1	73.0	55.7
4:00 PM	7/16/24	61.8	73.4	55.9
5:00 PM	7/16/24	61.6	70.4	55.8
6:00 PM	7/16/24	60.3	70.3	54.5
7:00 PM	7/16/24	60.1	65.8	54.4
8:00 PM	7/16/24	61.9	76.9	57.8
9:00 PM	7/16/24	60.0	68.4	53.7
10:00 PM	7/16/24	59.9	69.8	53.8
11:00 PM	7/16/24	59.6	66.2	52.7
12:00 AM	7/17/24	59.3	69.1	51.9
1:00 AM	7/17/24	57.9	64.0	50.5
2:00 AM	7/17/24	58.5	69.0	51.5
3:00 AM	7/17/24	60.8	67.8	51.9
4:00 AM	7/17/24	64.9	70.7	58.6
5:00 AM	7/17/24	63.3	73.1	57.9
6:00 AM	7/17/24	62.6	68.9	57.8
7:00 AM	7/17/24	62.3	69.3	57.1
8:00 AM	7/17/24	59.8	70.7	54.7
9:00 AM	7/17/24	61.3	68.0	56.1
10:00 AM	7/17/24	59.8	65.7	54.9
11:00 AM	7/17/24	67.4	87.7	56.5

Source: Compiled by LSA Associates, Inc. (2024).

dBA = A-weighted decibel
L_{eq} = equivalent continuous sound level
L_{max} = maximum instantaneous noise level
L_{min} = minimum measured sound level



Noise Measurement Survey – 24 HR

Project Number: 20241723
Project Name: San Antonio

Test Personnel: Amber Hazelrigg
Equipment: Spark 706RC (SN: 17206)

Site Number: LT-2 Date: 7/16/24

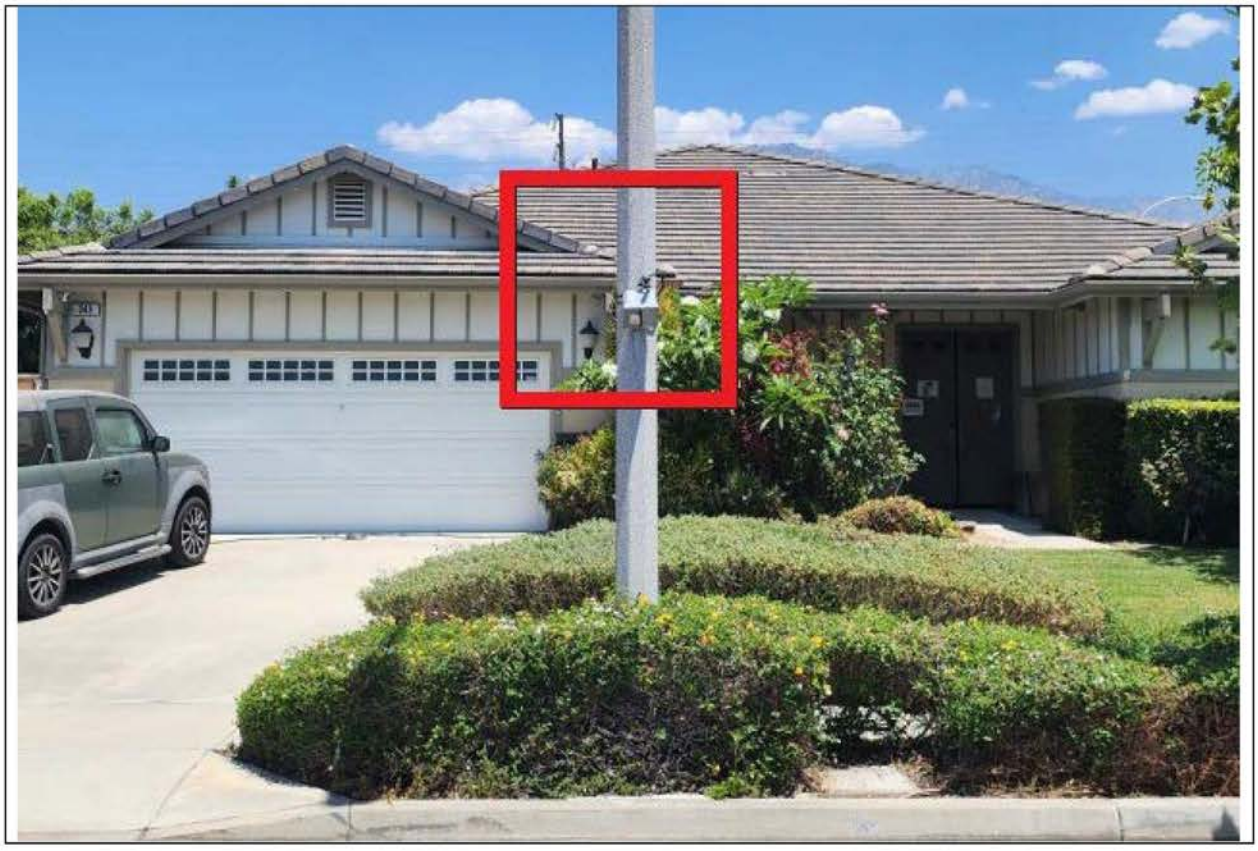
Time: From 1 pm To 1 pm

Site Location: The monitor was hung on a light pole on the across from the southwestern side of the project site. It is approximately 175 feet to the 210 freeway centerline and 72 feet from Flower Court.

Primary Noise Sources: The primary noise source is the 210 freeway.

Comments:

Photo:

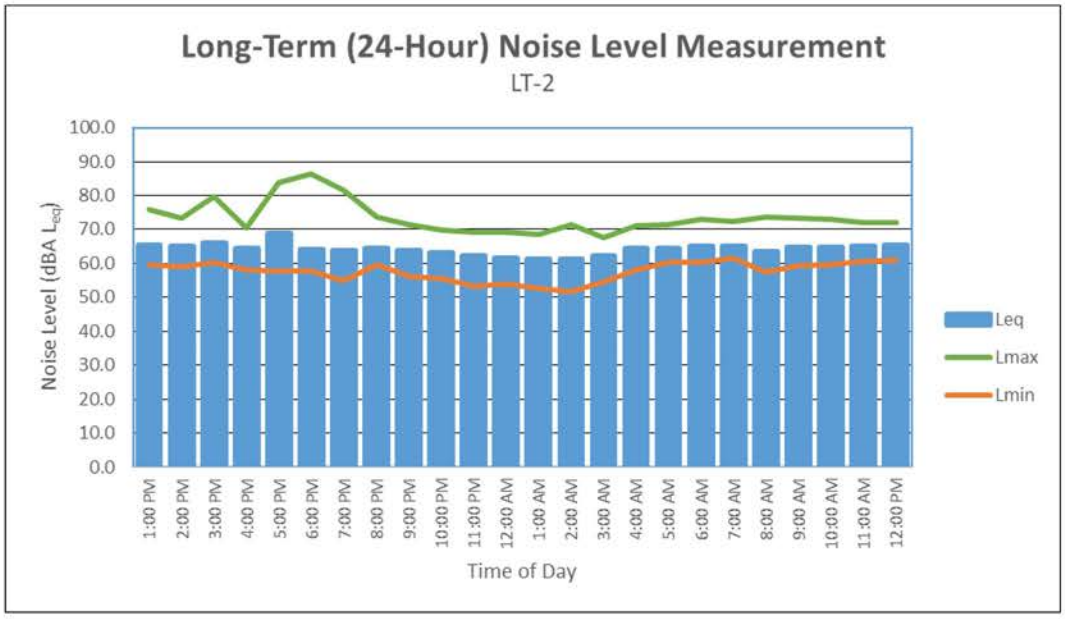


Long-Term (24-Hour) Noise Level Measurement Results at LT-2

Start Time	Date	Noise Level (dBA)		
		L_{eq}	L_{max}	L_{min}
1:00 PM	7/16/11	65.4	75.8	59.7
2:00 PM	7/16/11	65.0	73.4	59.1
3:00 PM	7/16/11	66.0	79.6	60.3
4:00 PM	7/16/11	64.5	70.4	58.0
5:00 PM	7/16/11	68.9	83.7	57.6
6:00 PM	7/16/11	64.1	86.5	57.7
7:00 PM	7/16/11	63.7	81.7	54.9
8:00 PM	7/16/11	64.4	73.7	59.8
9:00 PM	7/16/11	63.6	71.3	56.3
10:00 PM	7/16/11	63.1	69.7	55.6
11:00 PM	7/16/11	62.2	69.3	53.3
12:00 AM	7/17/11	61.6	69.1	53.8
1:00 AM	7/17/11	61.1	68.4	52.5
2:00 AM	7/17/11	61.1	71.3	51.6
3:00 AM	7/17/11	62.2	67.7	54.4
4:00 AM	7/17/11	64.6	71.1	58.1
5:00 AM	7/17/11	64.5	71.3	60.2
6:00 AM	7/17/11	65.0	73.1	60.4
7:00 AM	7/17/11	65.0	72.5	61.6
8:00 AM	7/17/11	63.4	73.7	57.3
9:00 AM	7/17/11	64.7	73.2	59.4
10:00 AM	7/17/11	64.6	72.9	59.7
11:00 AM	7/17/11	65.1	72.2	60.7
12:00 PM	7/17/11	65.4	72.1	60.8

Source: Compiled by LSA Associates, Inc. (2024).

dBA = A-weighted decibel
L_{eq} = equivalent continuous sound level
L_{max} = maximum instantaneous noise level
L_{min} = minimum measured sound level



ATTACHMENT D

CONSTRUCTION NOISE CALCULATIONS

Construction Calculations

Phase: Site Preparation

Equipment	Quantity	Reference (dBA) 50 ft Lmax	Usage Factor[1]	Distance to Receptor (ft)	Ground Effects	Noise Level (dBA)	
						Lmax	Leq
Grader	1	85	40	50	0.5	85	81
Scraper	1	84	40	50	0.5	84	80
Tractor	1	84	40	50	0.5	84	80
					Combined at 50 feet	**89**	**85**
					Combined at Receptor 250 feet	**75**	**71**

Phase: Grading

Equipment	Quantity	Reference (dBA) 50 ft Lmax	Usage Factor[1]	Distance to Receptor (ft)	Ground Effects	Noise Level (dBA)	
						Lmax	Leq
Grader	1	85	40	50	0.5	85	81
Dozer	1	82	40	50	0.5	82	78
Tractor	2	84	40	50	0.5	84	83
					Combined at 50 feet	**89**	**86**
					Combined at Receptor 250 feet	**75**	**72**
					Combined at Receptor 405 feet	**70**	**68**

Phase:Building Construstion

Equipment	Quantity	Reference (dBA) 50 ft Lmax	Usage Factor[1]	Distance to Receptor (ft)	Ground Effects	Noise Level (dBA)	
						Lmax	Leq
Crane	1	81	16	50	0.5	81	73
Man Lift	1	75	20	50	0.5	75	68
Tractor	1	84	40	50	0.5	84	80
Generator	1	81	50	50	0.5	81	78
Welder / Torch	3	74	40	50	0.5	74	75
					Combined at 50 feet	**87**	**83**
					Combined at Receptor 250 feet	**74**	**69**

Phase:Paving

Equipment	Quantity	Reference (dBA) 50 ft Lmax	Usage Factor[1]	Distance to Receptor (ft)	Ground Effects	Noise Level (dBA)	
						Lmax	Leq
Drum Mixer	1	80	50	50	0.5	80	77
Paver	1	77	50	50	0.5	77	74
Tractor	1	84	40	50	0.5	84	80
Roller	1	80	20	50	0.5	80	73
All Other Equipment > 5 hp	1	85	50	50	0.5	85	82
					Combined at 50 feet	**89**	**85**
					Combined at Receptor 250 feet	**75**	**72**

Phase:Architectural Coating

Equipment	Quantity	Reference (dBA) 50 ft Lmax	Usage Factor[1]	Distance to Receptor (ft)	Ground Effects	Noise Level (dBA)	
						Lmax	Leq
Compressor (air)	1	78	40	50	0.5	78	74
					Combined at 50 feet	**78**	**74**
					Combined at Receptor 250 feet	**64**	**60**

Sources: RCNM

[1]- Percentage of time that a piece of equipment is operating at full power.
dBA – A-weighted Decibels
Lmax- Maximum Level
Leq- Equivalent Level

ATTACHMENT E

FHWA TRAFFIC NOISE PRINTOUTS

TABLE Existing -01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/31/2024
ROADWAY SEGMENT: 20th Street West of Winston Court
NOTES: San Antonio Water Headquarters Project - Existing

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 80 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 15 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 42.39

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL	70 CNEL	65 CNEL	60 CNEL	55 CNEL
	0.0	0.0	0.0	0.0

TABLE Existing -02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/31/2024
ROADWAY SEGMENT: 20th Street East of Winston Court
NOTES: San Antonio Water Headquarters Project - Existing

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 0 SPEED (MPH): 35 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 15 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 23.36

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Existing -03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/31/2024
ROADWAY SEGMENT: 20th Street East of Campus Avenue
NOTES: San Antonio Water Headquarters Project - Existing

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 7910 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES			
	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 20 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 61.95

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	92.7	195.9

TABLE Existing -04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/31/2024
ROADWAY SEGMENT: Campus Avenue North of 20th Street
NOTES: San Antonio Water Headquarters Project - Existing

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 7910 SPEED (MPH): 40 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 15 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.76

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	54.4	113.6	242.9

TABLE Existing With Project -01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/31/2024
ROADWAY SEGMENT: 20th Street West of Winston Court
NOTES: San Antonio Water Headquarters Project - Existing With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 190 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES			
	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 15 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 46.14

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Existing With Project -02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/31/2024
ROADWAY SEGMENT: 20th Street East of Winston Court
NOTES: San Antonio Water Headquarters Project - Existing With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 30 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES			
	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 15 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 38.13

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Existing With Project -03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/31/2024
ROADWAY SEGMENT: 20th Street East of Campus Avenue
NOTES: San Antonio Water Headquarters Project - Existing With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 8070 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 20 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 62.04

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL	70 CNEL	65 CNEL	60 CNEL	55 CNEL
	0.0	0.0	93.9	198.5

TABLE Existing With Project -04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/31/2024
ROADWAY SEGMENT: Campus Avenue North of 20th Street
NOTES: San Antonio Water Headquarters Project - Existing With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 7910 SPEED (MPH): 40 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES			
	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 15 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.76

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	54.4	113.6	242.9

TABLE Opening Year (2027) Without Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/31/2024
ROADWAY SEGMENT: 20th Street West of Winston Court
NOTES: San Antonio Water Headquarters Project - Opening Year (2027) Without Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 100 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 15 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 43.36

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Opening Year (2027) Without Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/31/2024
ROADWAY SEGMENT: 20th Street East of Winston Court
NOTES: San Antonio Water Headquarters Project - Opening Year (2027) Without Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 0 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 15 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 23.36

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Opening Year (2027) Without Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/31/2024
ROADWAY SEGMENT: 20th Street East of Campus Avenue
NOTES: San Antonio Water Headquarters Project - Opening Year (2027) Without Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 8570 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 20 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 62.30

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	97.5	206.6

TABLE Opening Year (2027) Without Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/31/2024
ROADWAY SEGMENT: Campus Avenue North of 20th Street
NOTES: San Antonio Water Headquarters Project - Opening Year (2027) Without Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 8540 SPEED (MPH): 40 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 15 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 64.09

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	57.0	119.4	255.6

TABLE Opening Year (2027) With Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/31/2024
ROADWAY SEGMENT: 20th Street West of Winston Court
NOTES: San Antonio Water Headquarters Project - Opening Year (2027) With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 210 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 15 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 46.58

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Opening Year (2027) With Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/31/2024
ROADWAY SEGMENT: 20th Street East of Winston Court
NOTES: San Antonio Water Headquarters Project - Opening Year (2027) With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 30 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 15 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 38.13

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Opening Year (2027) With Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/31/2024
ROADWAY SEGMENT: 20th Street East of Campus Avenue
NOTES: San Antonio Water Headquarters Project - Opening Year (2027) With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 8730 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 20 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 62.38

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	98.7	209.1

TABLE Opening Year (2027) With Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/31/2024
ROADWAY SEGMENT: Campus Avenue North of 20th Street
NOTES: San Antonio Water Headquarters Project - Opening Year (2027) With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 8540 SPEED (MPH): 40 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES		
DAY	EVENING	NIGHT
---	---	---
AUTOS		
75.51	12.57	9.34
M-TRUCKS		
1.56	0.09	0.19
H-TRUCKS		
0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 15 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 64.09

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
---	---	---	---
0.0	57.0	119.4	255.6

TABLE Horizon 2050 (Without) Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/31/2024
ROADWAY SEGMENT: 20th Street West of Winston Court
NOTES: San Antonio Water Headquarters Project - Horizon 2050 (Without) Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 100 SPEED (MPH): 35 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 15 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 43.36

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Horizon 2050 (Without) Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/31/2024
ROADWAY SEGMENT: 20th Street East of Winston Court
NOTES: San Antonio Water Headquarters Project - Horizon 2050 (Without) Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 0 SPEED (MPH): 35 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 15 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 23.36

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Horizon 2050 (Without) Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/31/2024
ROADWAY SEGMENT: 20th Street East of Campus Avenue
NOTES: San Antonio Water Headquarters Project - Horizon 2050 (Without) Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 9290 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 20 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 62.65

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	102.7	217.9

TABLE Horizon 2050 (Without) Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/31/2024
ROADWAY SEGMENT: Campus Avenue North of 20th Street
NOTES: San Antonio Water Headquarters Project - Horizon 2050 (Without) Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 9260 SPEED (MPH): 40 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 15 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 64.44

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	60.0	125.9	269.7

TABLE Horizon (2050) With Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/31/2024
ROADWAY SEGMENT: 20th Street West of Winston Court
NOTES: San Antonio Water Headquarters Project - Horizon (2050) With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 210 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 15 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 46.58

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Horizon (2050) With Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/31/2024
ROADWAY SEGMENT: 20th Street East of Winston Court
NOTES: San Antonio Water Headquarters Project - Horizon (2050) With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 30 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES		
DAY	EVENING	NIGHT
---	---	---
AUTOS		
75.51	12.57	9.34
M-TRUCKS		
1.56	0.09	0.19
H-TRUCKS		
0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 15 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 38.13

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
---	---	---	---
0.0	0.0	0.0	0.0

TABLE Horizon (2050) With Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/31/2024
ROADWAY SEGMENT: 20th Street East of Campus Avenue
NOTES: San Antonio Water Headquarters Project - Horizon (2050) With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 9450 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 20 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 62.72

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	103.8	220.4

TABLE Horizon (2050) With Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/31/2024
ROADWAY SEGMENT: Campus Avenue North of 20th Street
NOTES: San Antonio Water Headquarters Project - Horizon (2050) With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 9260 SPEED (MPH): 40 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 15 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 64.44

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	60.0	125.9	269.7

ATTACHMENT F

OPERATIONAL NOISE LEVEL CALCULATIONS

Stationary Noise

	Land Use	Direction	Noise Source	Peak Hour Daytime Reference Noise Level at 50 ft (dBA Leq)	Off-Peak Nighttime Reference Noise Level at 50 ft (dBA Leq)	Reference Distance (ft)	Distance (ft)	Distance Attenuation (dBA)	Peak Hour Daytime Reference Noise Level at Receptor (dBA Leq)	Off-Peak Nighttime Reference Noise Level at Receptor (dBA Leq)
1	Residential	West	Truck Load/Unload Activity	72.0	72.0	20	395	25.9	46.1	46.1
			HVAC 1	75.0	75.0	5	520	40.3	34.7	34.7
			HVAC 2	75.0	75.0	5	525	40.4	34.6	34.6
								Combined	**46.7**	**46.7**
1	Residential	North	Truck Load/Unload Activity	72.0	72.0	20	410	26.2	45.8	45.8
			HVAC 1	75.0	75.0	5	335	36.5	38.5	38.5
			HVAC 2	75.0	75.0	5	410	38.3	36.7	36.7

APPENDIX G

TRAFFIC IMPACT ANALYSIS

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CARLSBAD
CLOVIS
IRVINE
LOS ANGELES
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROSEVILLE
SAN LUIS OBISPO

MEMORANDUM

DATE: July 15, 2025

TO: Brian Lee, General Manager, San Antonio Water Company

FROM: Ambarish Mukherjee, AICP, PE

SUBJECT: San Antonio Water Company Headquarters Project – Driveway Sensitivity Analysis Memorandum (LSA Project # 20241723)

This memorandum has been prepared to determine the project's effect on the study area previously analyzed in the *San Antonio Water Headquarters Traffic Impact Analysis*, dated November 2024 (referred as November 2024 TIA) as a result of modifications to the proposed project driveways after submittal of the November 2024 TIA. Figure 1 illustrates the updated conceptual site plan for the proposed project. The updated site plan's changes include removal of the proposed Project Driveway 2 previously analyzed in November 2024 TIA, while the project land use intensities and description remain the same. The project is anticipated to be screened out from a VMT analysis and no revisions for the VMT analysis will be required.

Project Description

The revised site plan has the same land use intensities and project description that was analyzed in the November 2024 TIA. As described in the November 2024 TIA, the proposed project proposes to develop a new 3,698-square-foot SAWCO headquarters and associated improvements including a 4,066-square-foot maintenance building, maintenance yard, driveway, parking, solar cover, landscaping, and utility improvements. The existing water storage tank, pump station, and signal buildings and tower would remain in place. The project is anticipated to be completed by 2027.

As analyzed in the November 2024 TIA, the project was accessed via three full-access driveways:

- **Project Driveway 1 on 20th Street:** This westerly driveway along the northern property boundary provides access for SAWCO patrons and customers;

- **Project Driveway 2 on 20th Street:** This driveway is located in the middle of the northeastern corner of the project site and provides access for the SAWCO employee parking area and maintenance facilities; This driveway was removed in the updated conceptual site plan and

- **Project Driveway 3 on Campus Avenue:** This easterly driveway located on the northeastern corner of the project site and will be a future connection with the intersection of Campus Avenue and 20th Street.

As shown in Figure 1, the updated site plan shows the project can be accessed via two full-access driveways:

- **Project Driveway 1 on 20th Street:** This westerly driveway along the northern property boundary provides access for SAWCO patrons and customers; and
- **Project Driveway 2 on Campus Avenue (previously Project Driveway 3 in November 2024 TIA):** This easterly driveway is located on the northeastern corner of the project site and will provide a future connection with the intersection of Campus Avenue and 20th Street.

Study Area

The November 2024 TIA examined traffic operations at the proposed 3 project driveways along 20th Street. Since the updated site plan removed the previous middle driveway this memorandum will examine traffic operations at the following intersections:

1. Project Driveway 1 on 20th Street
2. Project Driveway 2 on Campus Avenue (previously Project Driveway 3 in November 2024 TIA):

Traffic operations at all study intersections will be analyzed during the weekday a.m. and p.m. peak hours. The a.m. peak hour is defined as the one hour period of the highest traffic volume occurring between 7:00 and 9:00 a.m. while the p.m. peak hour is defined as the one hour period of the highest traffic volume occurring between 4:00 and 6:00 p.m. Intersection LOS will be calculated using the *Highway Capacity Manual* 7th Edition (HCM 7) analysis methodologies and by using the Synchro 12 software. Thus this memorandum's intersection methodology is consistent with that in the November 2024 TIA.

Project Trip Generation

Since the project land use intensities and description remains unchanged, the project trip generation remains the same as analyzed in November 2024 TIA. As described in the November 2024 TIA, the trip generation for the proposed project was developed as follows:

Employee Trip Generation

The project is anticipated to have 10 full-time employees. The November 2024 TIA, analyzed all 10 employees are anticipated to arrive at the facility in the a.m. peak hour and leave the facility in the p.m. peak hour. Therefore, the project is estimated to generate 20 daily employee trips with 10 inbound a.m. peak hour trips and 10 outbound p.m. peak hour trips.

Additionally, based on the project description and operational information, the project was anticipated to have six trucks for the operations. Based on information from the applicant, the truck trips were described as follows:

- **Truck #1 (Two-Axle Light-Duty Truck):** This truck is considered a standby vehicle and will average around 80–90 miles per day.

- **Truck #2 (Two-Axle Light-Duty Truck):** Truck #2 is considered a retired standby vehicle/support vehicle for construction jobs and will average around 20–25 miles per day.

- **Truck #3 (Two-Axle Light-Duty Truck):** This truck is considered a general maintenance/support vehicle for construction jobs and will average around 20–25 miles per day. It is likely only to be driven for around 75 percent of work week.

- **Truck #4 (Two-Axle Medium-Duty Truck):** Truck #4 is considered a dump truck. This vehicle will average 20–25 miles per day and is usually only driven about 4–5 days per month.

- **Truck #5 (Two-Axle Medium-Duty Truck):** This truck is considered a service truck and planned to be used for larger construction jobs and heavy maintenance. This vehicle will average around 20–25 miles per day and likely only to be driven for around 75 percent of the work week.

- **Truck #6 (Two-Axle Light-Duty Truck):** This vehicle has an auxiliary fuel tank that will be used for refueling the project's tractors. Occasionally used for short runs for parts and supplies. It will average around 20–25 miles per day and likely only to be driven for around 5–6 days per month.

In the November 2024 TIA, all trucks were considered to be two-axle trucks and operating within the same day as a conservative estimate. Therefore, it was estimated that the project will be generating 12 daily employee truck trips (inbound and outbound combined). Based on the operational hours, these trips could be estimated as peak-hour trips, with six outbound truck trips occurring during a.m. peak hour and six inbound truck trips occurring during the p.m. peak hour. All truck trips were converted to PCE trips using a 1.5 PCE factor for two-axle trucks based on the traffic guidelines.

Customer Trip Generation

- **Headquarter Building:** The trip generation for this component was developed using rates from the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (11th Edition) for Land Use 712 – "Small Office Building."

Table A summarizes the project trip generation as included in the November 2024 TIA. As shown in Table A, the project was anticipated to generate 91 total net daily PCE trips, with 25 net PCE trips occurring during the a.m. peak hour and 27 net PCE trips occurring during the p.m. peak hour.

Project Trip Distribution

The removal of Project Driveway 2 causes employee's passenger vehicle project trips to be rerouted from Project Driveway 2 (November 2024 TIA) to Project Driveway 2 on Campus Avenue (previously Project Driveway 3 in November 2024 TIA). All other distributions analyzed in November 2024 TIA remain the same.

Figure 2 illustrates the project trip distribution for the employees. Figure 3 illustrates the project trip distribution for the maintenance trucks. Figure 4 illustrates the customer trip distribution. The project trip assignment at the study intersections is the product of the project trip generation and the corresponding trip distribution percentages. Figure 5 illustrates the total project trip assignment.

Volume Development

For purposes of this analysis, the same analysis scenarios analyzed in the November 2024 TIA has been included in this analysis. As such, the "without project" scenarios traffic volumes from the November 2024 TIA were used for this analysis.

Due to the removal of the previously analyzed Project Driveway 2 in the November 2024 TIA, all "plus project" scenarios include re-routing of employee project trips to the easterly driveway on Campus Avenue (previously Project Driveway 3 in November 2024 TIA). Figure 6 illustrates the Opening Year (2027) plus project volumes, and Horizon Year (2050) plus project traffic volumes. Detailed volume development worksheets are included in Appendix A.

Level of Service Analysis

The intersection LOS analysis was conducted using methodologies consistent with that of the November 2024 TIA. Tables B and C summarize the results of the LOS analysis under all plus project scenarios. As shown in Tables B and C, all study intersections are forecast to operate at a satisfactory LOS with the removal of the middle driveway and rerouted project trips. Detailed LOS worksheets are included in Appendix B.

Conclusion

In summary, the revised site plan changes include a removal of the middle project driveway from the November 2024 TIA. Additionally, since the project land use intensities and description remain unchanged except for the removal of middle project driveway, the LOS analysis shows no additional traffic operations deficiencies are forecast to occur similar to the results in the November 2024 TIA. Since the project description and land use intensities remain unchanged, the project is screened out from a VMT analysis and no revisions for the VMT analysis will be required.

ATTACHMENTS:

Figures

Figure 1: Conceptual Site Plan
Figure 2: Project Trip Distribution – Employee
Figure 3: Project Trip Distribution - Maintenance Trucks
Figure 4: Project Trip Distribution - Customers
Figure 5: Total Project Trip Assignment
Figure 6: Peak Hour Traffic Volumes

Tables

Table A: Project Trip Generation
Table B: Opening Year (2027) Intersection Levels of Service
Table C: Horizon Year (2050) Intersection Levels of Service

Appendix

Appendix A: Volume Development Worksheets
Appendix B: Intersection Levels of Service Worksheets

TABLES

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Table A: Project Trip Generation

Land Uses		Units	A.M. Peak Hour In	A.M. Peak Hour Out	A.M. Peak Hour Total	P.M. Peak Hour In	P.M. Peak Hour Out	P.M. Peak Hour Total	Daily
San Antonio Water Headquarters & Maintenance Buildings									
Employee Trip Generation[1]			10	0	10	0	10	10	20
Employee Maintenance Truck Trip Generation[2]			0	6	6	6	0	6	12
Employee Maintenance Truck PCE Trip Generation[3]			0	9	9	9	0	9	18
Headquarter Building									
Headquarters Building Trip/Unit[4]	3.698	TSF	1.37	0.30	1.67	0.73	1.43	2.16	14.39
Headquarters Building Customer Trip Generation			5	1	6	3	5	8	53
Total PCE Trip Generation			**15**	**10**	**25**	**12**	**15**	**27**	**91**

Notes:

TSF = thousand square-feet

[1] The employee trip generation was developed based on the project description and operational information.

[2] The maintenance truck trip generation was developed based on the project's operational information. All trucks are 2-axle trucks.

[3] All maintenance truck trips were converted to passenger PCEs using a 1.5 PCE factor for 2-axle trucks based on City of Upland's *Traffic Impact Analysis Guidelines* , dated July 2020.

[4] Rates from Institute of Transportation Engineers (ITE) *Trip Generation Manual* , (11th Edition) for Land Use 712 - "Small Office Building" , Setting/Location - 'General Urban/Suburban'.

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Table B: Opening Year (2027) Intersection Levels of Service

Intersection	Jurisdiction	LOS Standard	Plus Project				
			Control	A.M. Peak Hour		P.M. Peak Hour	
				Delay (sec.)	LOS	Delay (sec.)	LOS
1 . Winston Court - Project Driveway 1/20th Street	Upland	D	TWSC	8.7	A	8.7	A
2 . Campus Avenue/Project Driveway 2 - 20th Street[1]	Upland	D	TWSC	5.6	A	10.5	B

Notes:

OWSC = One-Way Stop Control; TWSC = Two-Way Stop Control; LOS = Level of Service

Delay = Average control delay in seconds (For OWSC/TWSC intersections, reported delay is for worst-case movement).

* Exceeds LOS Standard

[1] For the purpose of this analysis, intersection was analyzed as a OWSC under ' without project" and TWSC under 'plus project' scenarios. Delay reported from SimTraffic under 'plus project' scenarios.

Table C: Horizon Year (2050) Intersection Levels of Service

Intersection	Jurisdiction	LOS Standard	Plus Project				
			Control	A.M. Peak Hour		P.M. Peak Hour	
				Delay (sec.)	LOS	Delay (sec.)	LOS
1 . Winston Court - Project Driveway 1/20th Street	Upland	D	TWSC	8.6	A	8.6	A
2 . Campus Avenue/Project Driveway 2 - 20th Street[1]	Upland	D	TWSC	5.4	A	10.6	B

Notes:

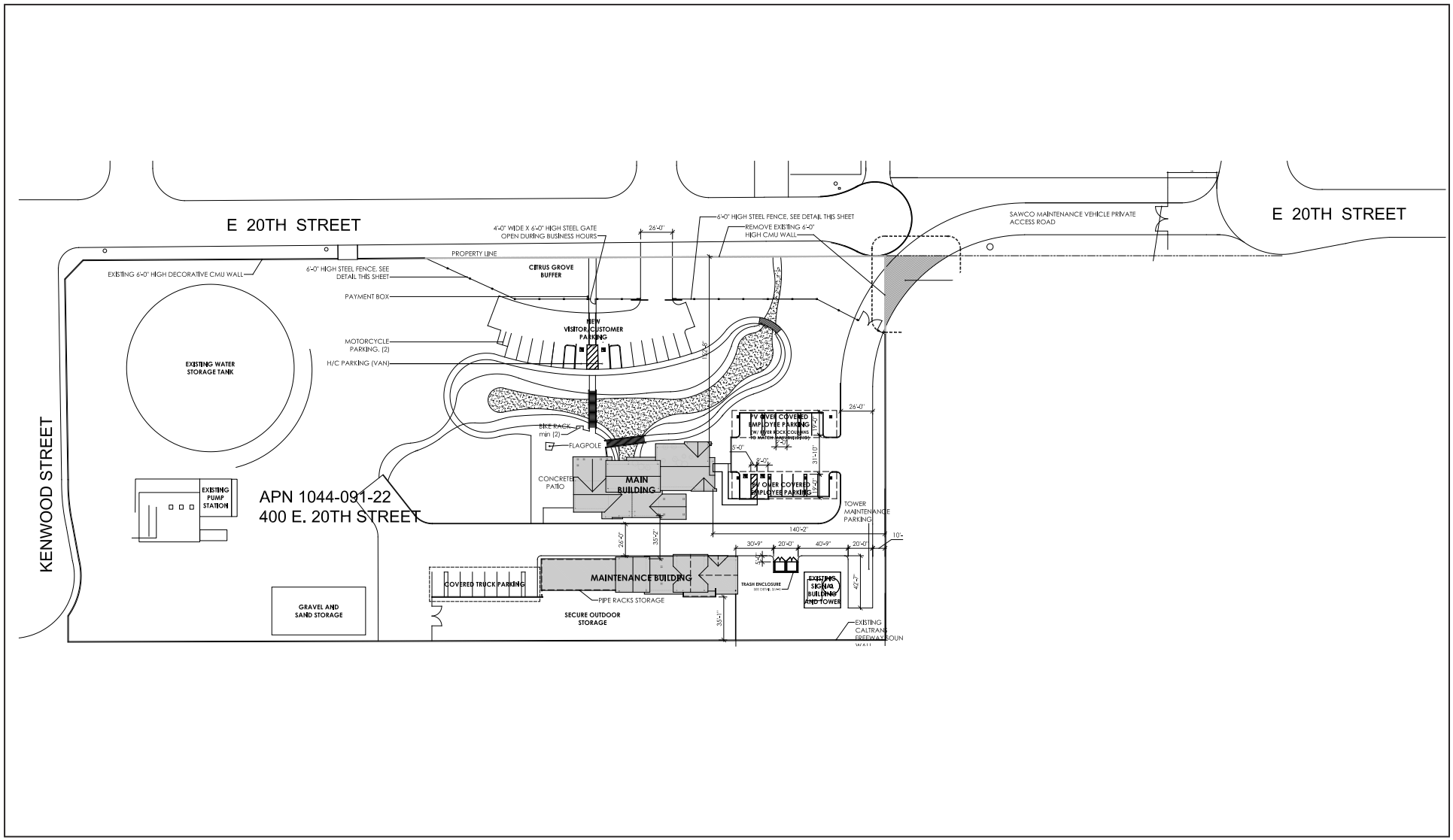
OWSC = One-Way Stop Control; TWSC = Two-Way Stop Control; LOS = Level of Service

Delay = Average control delay in seconds (For OWSC/TWSC intersections, reported delay is for worst-case movement).

* Exceeds LOS Standard

[1] For the purpose of this analysis, intersection was analyzed as a OWSC under ' without project" and TWSC under 'plus project' scenarios. Delay reported from SimTraffic under 'plus project' scenarios.

FIGURES



LSA

FIGURE 1

N

0 60 120

FEET

San Antonio Water Company Headquarters
Driveway Sensitivity Analysis Memorandum

Conceptual Site Plan

SOURCE: CEDG Architects, Inc., October 2024

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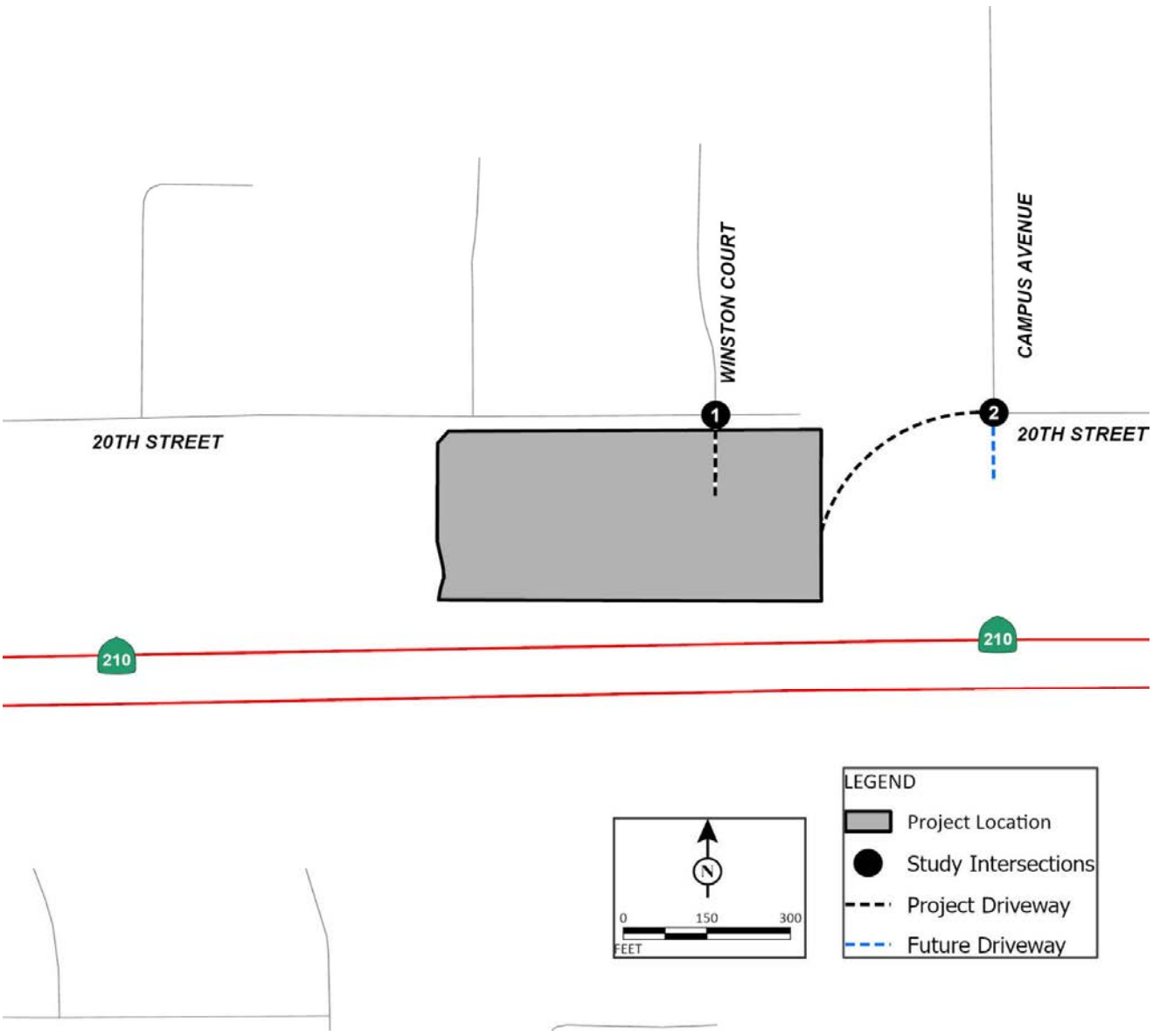
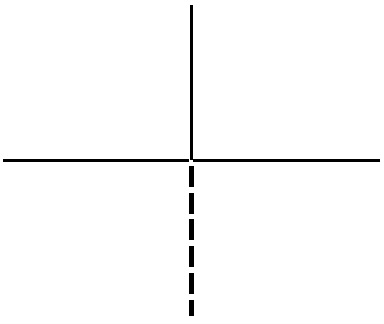
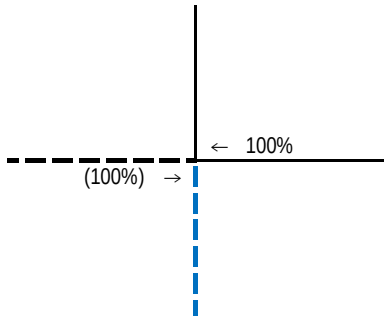




1 **Winston Court - Project Driveway 1/20th Street**



2 **Campus Avenue/Project Driveway 2 - 20th Street**

FIGURE 2

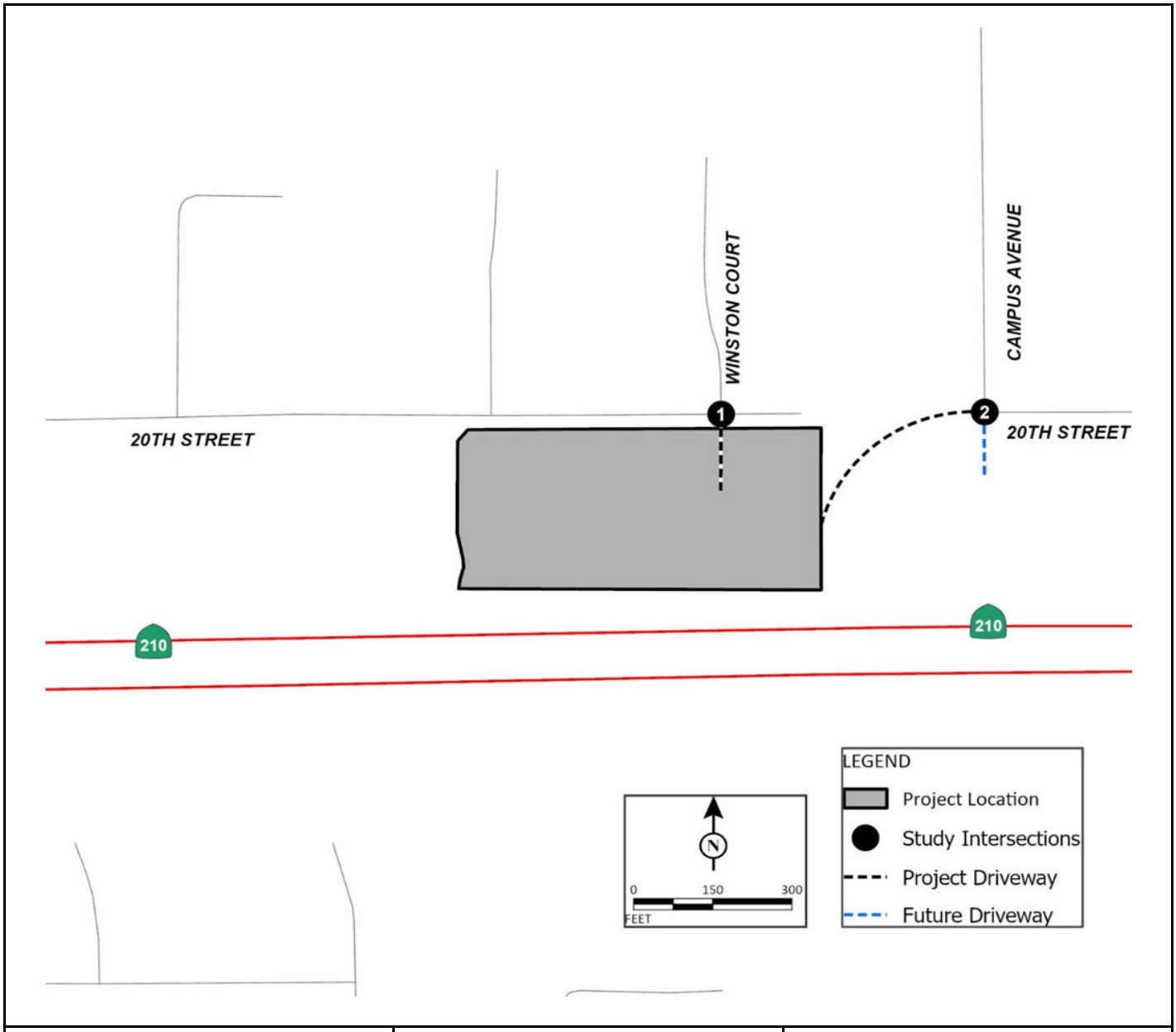
LSA

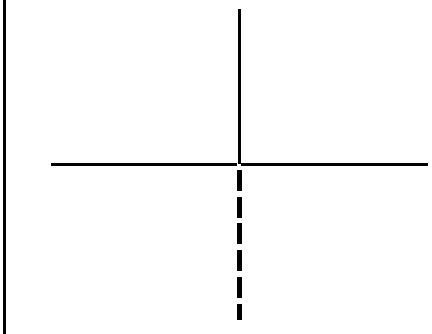
XXX% (YYY%)
Inbound (Outbound) Distribution

Project Driveway
Future Driveway

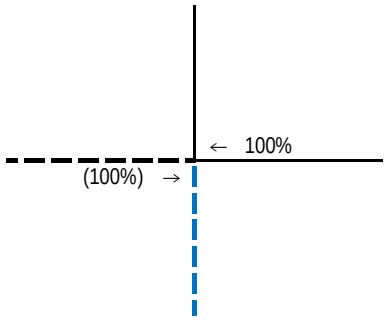
San Antonio Water Company Headquarters
Driveway Sensitivity Analysis Memorandum

Project Trip Distribution – Employees





1 **Winston Court - Project Driveway 1/20th Street**



2 **Campus Avenue/Project Driveway 2 - 20th Street**

FIGURE 3

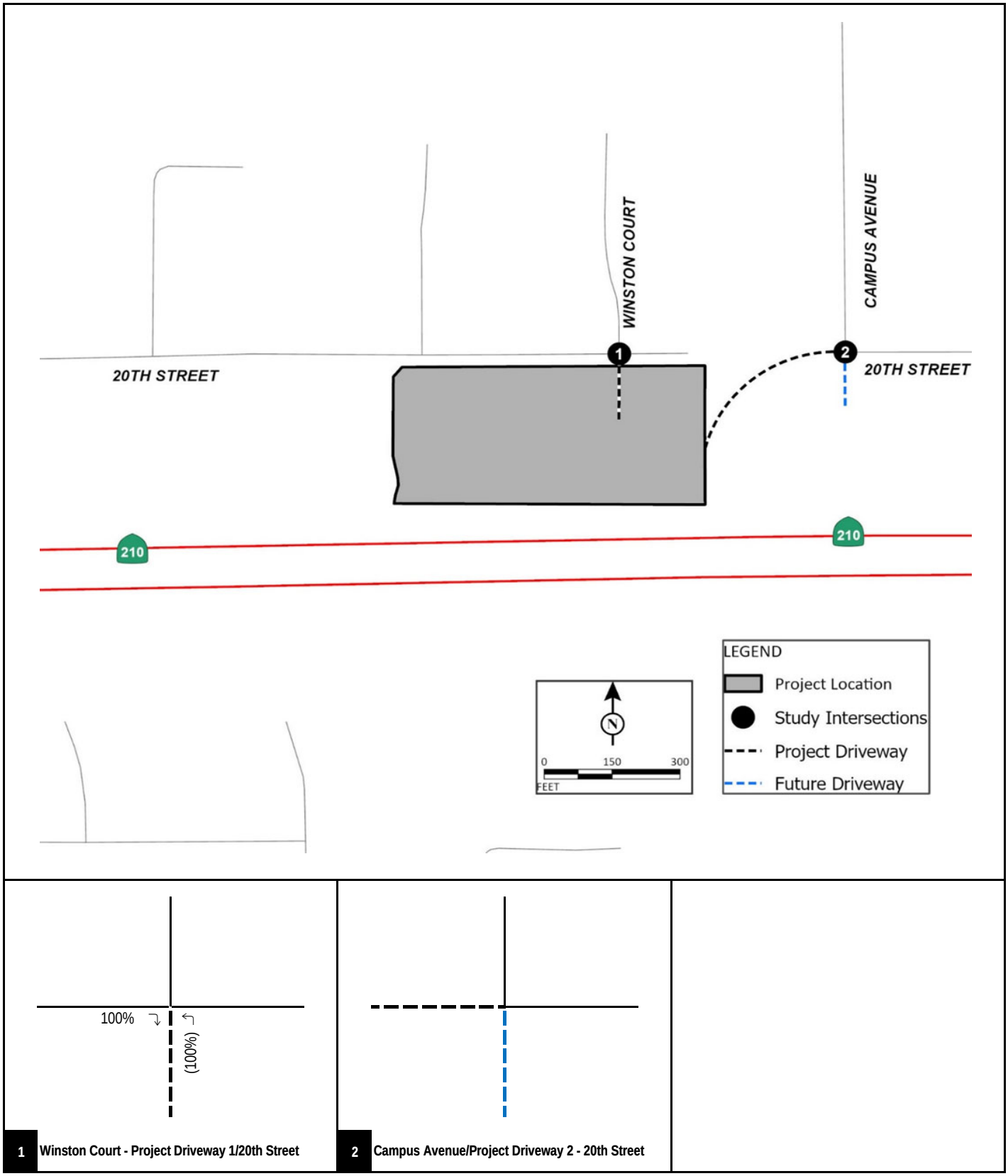
LSA

XXX% (YYY%)
Inbound (Outbound) Distribution

Project Driveway
Future Driveway

San Antonio Water Company Headquarters
Traffic Impact Analysis

Project Trip Distribution – Maintenance Trucks



1 **Winston Court - Project Driveway 1/20th Street**

2 **Campus Avenue/Project Driveway 2 - 20th Street**

FIGURE 4

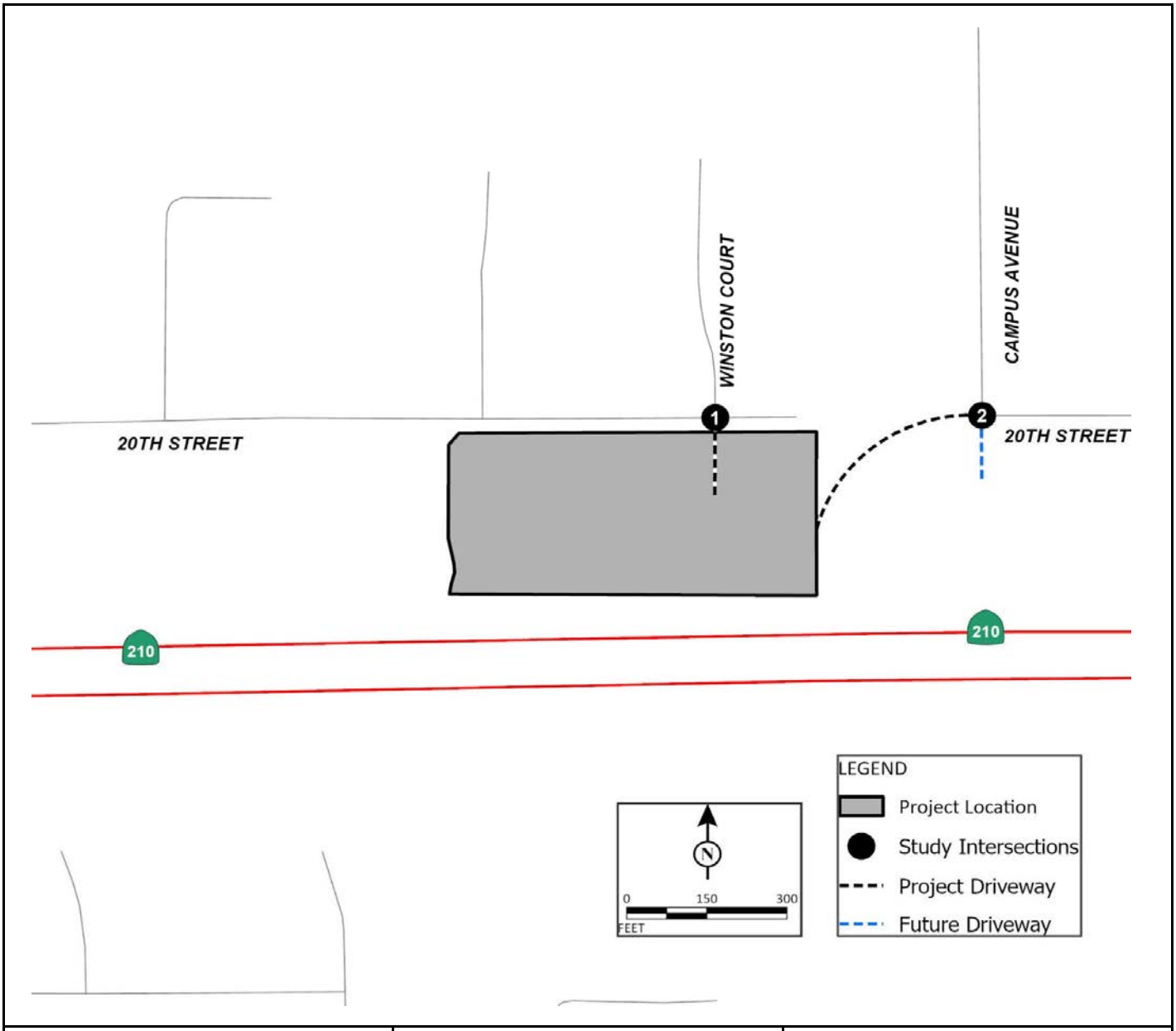
LSA

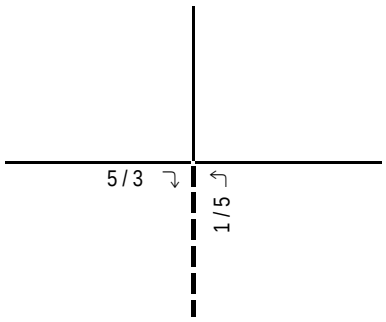
XXX% (YYY%)
Inbound (Outbound) Distribution

Project Driveway
Future Driveway

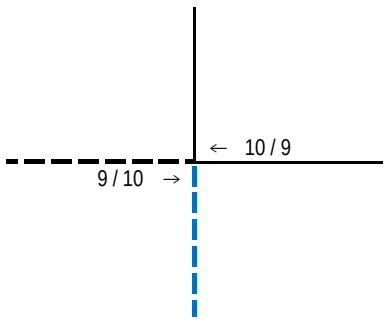
San Antonio Water Company Headquarters
Traffic Impact Analysis

Project Trip Distribution – Customers





1 **Winston Court - Project Driveway 1/20th Street**



2 **Campus Avenue/Project Driveway 2 - 20th Street**

FIGURE 5

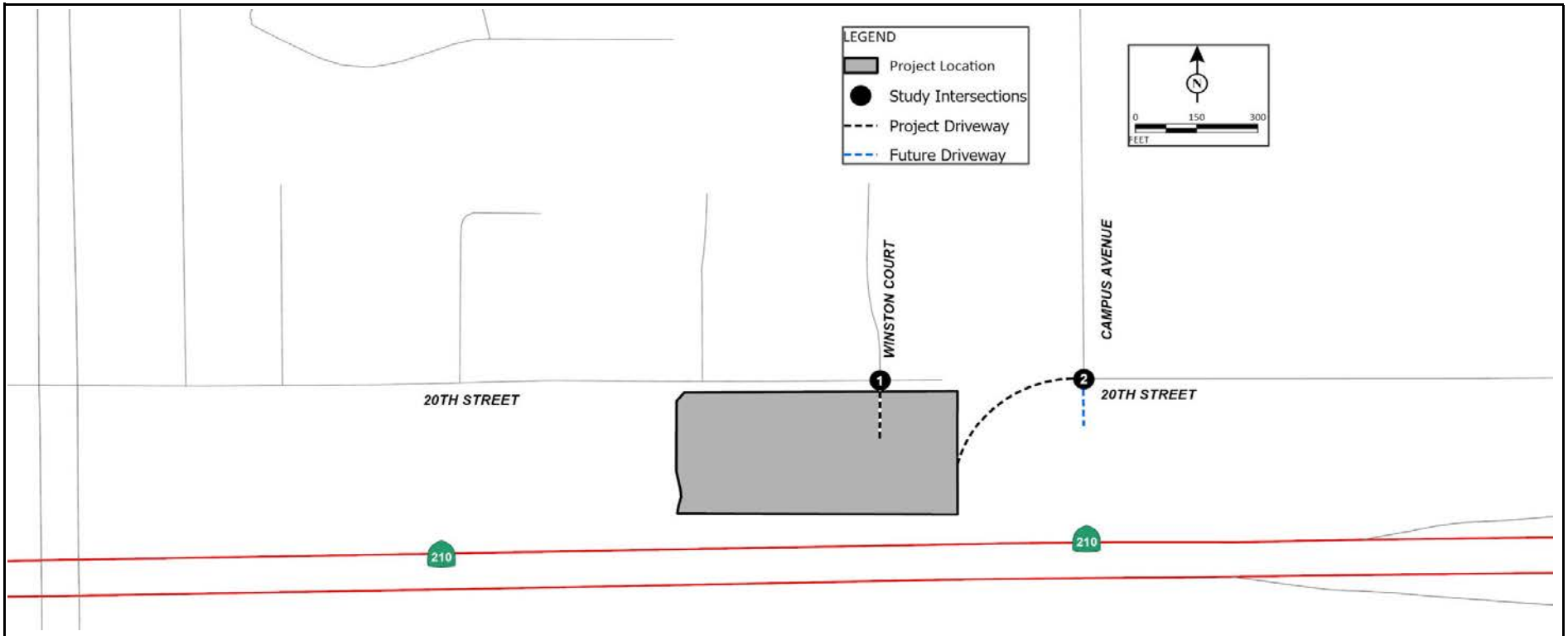
LSA

XX / YY
AM / PM Peak Hour PCE Trips

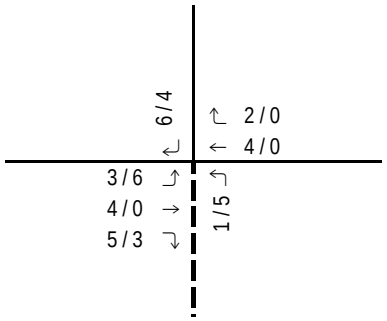
Project Driveway
Future Driveway

San Antonio Water Company Headquarters
Driveway Sensitivity Analysis Memorandum

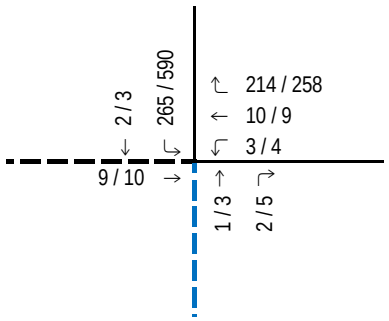
Total Project Trip Assignment



Opening Year (2027) plus Project

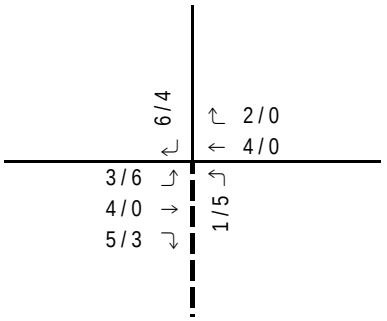


1 Winston Court - Project Driveway 1/20th Street

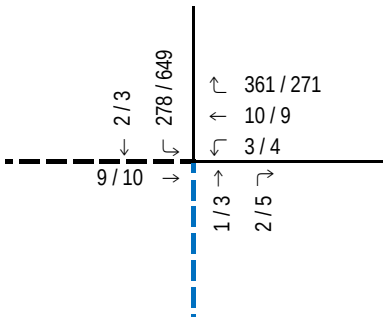


2 Campus Avenue/Project Driveway 2 - 20th Street

Horizon Year (2050) plus Project



1 Winston Court - Project Driveway 1/20th Street



2 Campus Avenue/Project Driveway 2 - 20th Street

FIGURE 6

LSA

XXX / YYY
AM / PM PCE Peak Hour Trips

Project Driveway
Future Driveway

San Antonio Water Company Headquarters
Driveway Sensitivity Analysis Memorandum

Peak Hour Traffic Volumes

APPENDICES

LSA

Appendix A - Opening Year (2027) Peak Hour PCE Volume Summary

	AM Peak Hour						PM Peak Hour					
	Existing w/o Project Volumes	2024 to 2027 Growth	Approved and Pending Project Trips	OY (2027) w/o Project Volumes	Project Trips	OY (2027) w/ Project Volumes	Existing w/o Project Volumes	2024 to 2027 Growth	Approved and Pending Project Trips	OY (2027) w/o Project Volumes	Project Trips	OY (2027) w/ Project Volumes
1 Winston Court - Project Driveway 1/20th Street												
NBL	0	0	0	0	1	1	0	0	0	0	5	5
NBT	0	0	0	0	0	0	0	0	0	0	0	0
NBR	0	0	0	0	0	0	0	0	0	0	0	0
SBL	0	0	0	0	0	0	0	0	0	0	0	0
SBT	0	0	0	0	0	0	0	0	0	0	0	0
SBR	5	0	1	6	0	6	3	0	1	4	0	4
EBL	2	0	1	3	0	3	5	0	1	6	0	6
EBT	4	0	0	4	0	4	0	0	0	0	0	0
EBR	0	0	0	0	5	5	0	0	0	0	3	3
WBL	0	0	0	0	0	0	0	0	0	0	0	0
WBT	4	0	0	4	0	4	0	0	0	0	0	0
WBR	2	0	0	2	0	2	0	0	0	0	0	0
North Leg												
Approach	5	0	1	6	0	6	3	0	1	4	0	4
Departure	4	0	1	5	0	5	5	0	1	6	0	6
Total	9	0	2	11	0	11	8	0	2	10	0	10
South Leg												
Approach	0	0	0	0	1	1	0	0	0	0	5	5
Departure	0	0	0	0	5	5	0	0	0	0	3	3
Total	0	0	0	0	6	6	0	0	0	0	8	8
East Leg												
Approach	6	0	0	6	0	6	0	0	0	0	0	0
Departure	4	0	0	4	0	4	0	0	0	0	0	0
Total	10	0	0	10	0	10	0	0	0	0	0	0
West Leg												
Approach	6	0	1	7	5	12	5	0	1	6	3	9
Departure	9	0	1	10	1	11	3	0	1	4	5	9
Total	15	0	2	17	6	23	8	0	2	10	8	18
Total Approaches												
Approach	17	0	2	19	6	25	8	0	2	10	8	18
Departure	17	0	2	19	6	25	8	0	2	10	8	18
Total	34	0	4	38	12	50	16	0	4	20	16	36

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Appendix A - Opening Year (2027) Peak Hour PCE Volume Summary

	AM Peak Hour						PM Peak Hour					
	Existing w/o Project Volumes	2024 to 2027 Growth	Approved and Pending Project Trips	OY (2027) w/o Project Volumes	Project Trips	OY (2027) w/ Project Volumes	Existing w/o Project Volumes	2024 to 2027 Growth	Approved and Pending Project Trips	OY (2027) w/o Project Volumes	Project Trips	OY (2027) w/ Project Volumes
2 Campus Avenue/Project Driveway 2 - 20th Street												
NBL	0	0	0	0	0	0	0	0	0	0	0	0
NBT	0	0	1	1	0	1	0	0	3	3	0	3
NBR	0	0	2	2	0	2	0	0	5	5	0	5
SBL	247	15	3	265	0	265	551	33	6	590	0	590
SBT	0	0	2	2	0	2	0	0	3	3	0	3
SBR	0	0	0	0	0	0	0	0	0	0	0	0
EBL	0	0	0	0	0	0	0	0	0	0	0	0
EBT	0	0	0	0	9	9	0	0	0	0	10	10
EBR	0	0	0	0	0	0	0	0	0	0	0	0
WBL	0	0	3	3	0	3	0	0	4	4	0	4
WBT	0	0	0	0	10	10	0	0	0	0	9	9
WBR	197	12	5	214	0	214	240	14	4	258	0	258
North Leg												
Approach	247	15	5	267	0	267	551	33	9	593	0	593
Departure	197	12	6	215	0	215	240	14	7	261	0	261
Total	444	27	11	482	0	482	791	47	16	854	0	854
South Leg												
Approach	0	0	3	3	0	3	0	0	8	8	0	8
Departure	0	0	5	5	0	5	0	0	7	7	0	7
Total	0	0	8	8	0	8	0	0	15	15	0	15
East Leg												
Approach	197	12	8	217	10	227	240	14	8	262	9	271
Departure	247	15	5	267	9	276	551	33	11	595	10	605
Total	444	27	13	484	19	503	791	47	19	857	19	876
West Leg												
Approach	0	0	0	0	9	9	0	0	0	0	10	10
Departure	0	0	0	0	10	10	0	0	0	0	9	9
Total	0	0	0	0	19	19	0	0	0	0	19	19
Total Approaches												
Approach	444	27	16	487	19	506	791	47	25	863	19	882
Departure	444	27	16	487	19	506	791	47	25	863	19	882
Total	888	54	32	974	38	1,012	1,582	94	50	1,726	38	1,764

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Appendix A - Horizon Year (2050) Peak Hour Volume Summary

	AM Peak Hour			PM Peak Hour		
	HY (2050) w/o Project Volumes	Project Trips	HY (2050) w/ Project Volumes	HY (2050) w/o Project Volumes	Project Trips	HY (2050) w/ Project Volumes
1 Winston Court - Project Driveway 1/20th Street						
NBL	0	1	1	0	5	5
NBT	0	0	0	0	0	0
NBR	0	0	0	0	0	0
SBL	0	0	0	0	0	0
SBT	0	0	0	0	0	0
SBR	6	0	6	4	0	4
EBL	3	0	3	6	0	6
EBT	4	0	4	0	0	0
EBR	0	5	5	0	3	3
WBL	0	0	0	0	0	0
WBT	4	0	4	0	0	0
WBR	2	0	2	0	0	0
North Leg						
Approach	6	0	6	4	0	4
Departure	5	0	5	6	0	6
Total	11	0	11	10	0	10
South Leg						
Approach	0	1	1	0	5	5
Departure	0	5	5	0	3	3
Total	0	6	6	0	8	8
East Leg						
Approach	6	0	6	0	0	0
Departure	4	0	4	0	0	0
Total	10	0	10	0	0	0
West Leg						
Approach	7	5	12	6	3	9
Departure	10	1	11	4	5	9
Total	17	6	23	10	8	18
Total Approaches						
Approach	19	6	25	10	8	18
Departure	19	6	25	10	8	18
Total	38	12	50	20	16	36

LSA

Appendix A - Horizon Year (2050) Peak Hour Volume Summary

	AM Peak Hour			PM Peak Hour		
	HY (2050) w/o Project Volumes	Project Trips	HY (2050) w/ Project Volumes	HY (2050) w/o Project Volumes	Project Trips	HY (2050) w/ Project Volumes
2 Campus Avenue/Project Driveway 2 - 20th Street						
NBL	0	0	0	0	0	0
NBT	1	0	1	3	0	3
NBR	2	0	2	5	0	5
SBL	278	0	278	649	0	649
SBT	2	0	2	3	0	3
SBR	0	0	0	0	0	0
EBL	0	0	0	0	0	0
EBT	0	9	9	0	10	10
EBR	0	0	0	0	0	0
WBL	3	0	3	4	0	4
WBT	0	10	10	0	9	9
WBR	361	0	361	271	0	271
North Leg						
Approach	280	0	280	652	0	652
Departure	362	0	362	274	0	274
Total	642	0	642	926	0	926
South Leg						
Approach	3	0	3	8	0	8
Departure	5	0	5	7	0	7
Total	8	0	8	15	0	15
East Leg						
Approach	364	10	374	275	9	284
Departure	280	9	289	654	10	664
Total	644	19	663	929	19	948
West Leg						
Approach	0	9	9	0	10	10
Departure	0	10	10	0	9	9
Total	0	19	19	0	19	19
Total Approaches						
Approach	647	19	666	935	19	954
Departure	647	19	666	935	19	954
Total	1,294	38	1,332	1,870	38	1,908

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	4	5	0	4	2	1	0	0	0	0	6
Future Vol, veh/h	3	4	5	0	4	2	1	0	0	0	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	75	75	75	75	75	75	75	75	75
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	4	5	7	0	5	3	1	0	0	0	0	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	8	0	0	12	0	0	22	25	9	20	27	7
Stage 1	-	-	-	-	-	-	17	17	-	7	7	-
Stage 2	-	-	-	-	-	-	5	8	-	13	20	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1625	-	-	1620	-	-	995	873	1079	998	870	1082
Stage 1	-	-	-	-	-	-	1008	886	-	1020	894	-
Stage 2	-	-	-	-	-	-	1022	893	-	1012	883	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1625	-	-	1620	-	-	986	870	1079	996	868	1082
Mov Cap-2 Maneuver	-	-	-	-	-	-	986	870	-	996	868	-
Stage 1	-	-	-	-	-	-	1006	883	-	1020	894	-
Stage 2	-	-	-	-	-	-	1014	893	-	1010	880	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	1.81	0	8.66	8.35
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	986	405	-	-	1620	-	-	1082
HCM Lane V/C Ratio	0.001	0.002	-	-	-	-	-	0.007
HCM Ctrl Dly (s/v)	8.7	7.2	0	-	0	-	-	8.4
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

2: Private Driveway /Campus Avenue & Project Driveway 2/20th Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.2	0.1	0.3	0.2
Total Delay (hr)	0.0	0.1	0.0	0.1	0.2
Total Del/Veh (s)	5.6	0.9	2.7	0.9	1.0
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	3.0	0.0	2.4	0.0	0.1

Intersection	
Int Delay, s/veh	6.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	0	3	0	0	0	5	0	0	0	0	4
Future Vol, veh/h	6	0	3	0	0	0	5	0	0	0	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	67	67	67	67	67	67	67	67	67	67	67	67
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	9	0	4	0	0	0	7	0	0	0	0	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1	0	0	4	0	0	22	22	2	19	24	1
Stage 1	-	-	-	-	-	-	20	20	-	1	1	-
Stage 2	-	-	-	-	-	-	1	1	-	18	22	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1634	-	-	1630	-	-	996	876	1088	999	874	1089
Stage 1	-	-	-	-	-	-	1004	883	-	1027	899	-
Stage 2	-	-	-	-	-	-	1027	899	-	1007	881	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1634	-	-	1630	-	-	985	871	1088	994	869	1089
Mov Cap-2 Maneuver	-	-	-	-	-	-	985	871	-	994	869	-
Stage 1	-	-	-	-	-	-	998	878	-	1027	899	-
Stage 2	-	-	-	-	-	-	1021	899	-	1001	876	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	4.81	0	8.68	8.32
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	985	1000	-	-	1630	-	-	1089
HCM Lane V/C Ratio	0.008	0.005	-	-	-	-	-	0.005
HCM Ctrl Dly (s/v)	8.7	7.2	0	-	0	-	-	8.3
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

2: Private Driveway /Campus Avenue & Project Driveway 2/20th Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Delay (hr)	0.0	0.0	0.0	0.1	0.1
Denied Del/Veh (s)	0.1	0.3	0.1	0.6	0.5
Total Delay (hr)	0.0	0.1	0.0	0.4	0.6
Total Del/Veh (s)	10.5	1.2	6.4	2.2	2.1
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.1
Stop Del/Veh (s)	8.3	0.0	5.0	0.1	0.2

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	4	5	0	4	2	1	0	0	0	0	6
Future Vol, veh/h	3	4	5	0	4	2	1	0	0	0	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	3	4	5	0	4	2	1	0	0	0	0	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	6	0	0	9	0	0	17	19	7	16	21	5
Stage 1	-	-	-	-	-	-	13	13	-	5	5	-
Stage 2	-	-	-	-	-	-	4	6	-	11	16	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1628	-	-	1623	-	-	1002	878	1082	1005	877	1084
Stage 1	-	-	-	-	-	-	1012	889	-	1022	895	-
Stage 2	-	-	-	-	-	-	1023	894	-	1016	886	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1628	-	-	1623	-	-	995	877	1082	1003	875	1084
Mov Cap-2 Maneuver	-	-	-	-	-	-	995	877	-	1003	875	-
Stage 1	-	-	-	-	-	-	1010	887	-	1022	895	-
Stage 2	-	-	-	-	-	-	1017	894	-	1014	885	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	1.8	0	8.62	8.34
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	995	405	-	-	1623	-	-	1084
HCM Lane V/C Ratio	0.001	0.002	-	-	-	-	-	0.006
HCM Ctrl Dly (s/v)	8.6	7.2	0	-	0	-	-	8.3
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

2: Private Driveway /Campus Avenue & Project Driveway 2/20th Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.1
Denied Del/Veh (s)	0.1	0.3	0.1	0.3	0.3
Total Delay (hr)	0.0	0.2	0.0	0.1	0.3
Total Del/Veh (s)	5.4	1.6	2.7	1.1	1.5
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	2.9	0.0	2.4	0.0	0.1

Intersection	
Int Delay, s/veh	6.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	0	3	0	0	0	5	0	0	0	0	4
Future Vol, veh/h	6	0	3	0	0	0	5	0	0	0	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	6	0	3	0	0	0	5	0	0	0	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1	0	0	3	0	0	15	15	2	14	17	1
Stage 1	-	-	-	-	-	-	14	14	-	1	1	-
Stage 2	-	-	-	-	-	-	1	1	-	13	16	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1635	-	-	1632	-	-	1005	883	1089	1008	881	1089
Stage 1	-	-	-	-	-	-	1011	888	-	1027	899	-
Stage 2	-	-	-	-	-	-	1027	899	-	1013	886	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1635	-	-	1632	-	-	998	880	1089	1004	878	1089
Mov Cap-2 Maneuver	-	-	-	-	-	-	998	880	-	1004	878	-
Stage 1	-	-	-	-	-	-	1007	884	-	1027	899	-
Stage 2	-	-	-	-	-	-	1023	899	-	1009	883	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	4.81	0	8.63	8.32
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	998	1000	-	-	1632	-	-	1089
HCM Lane V/C Ratio	0.005	0.004	-	-	-	-	-	0.004
HCM Ctrl Dly (s/v)	8.6	7.2	0	-	0	-	-	8.3
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

2: Private Driveway /Campus Avenue & Project Driveway 2/20th Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Delay (hr)	0.0	0.0	0.0	0.1	0.1
Denied Del/Veh (s)	0.1	0.3	0.1	0.6	0.5
Total Delay (hr)	0.0	0.1	0.0	0.4	0.6
Total Del/Veh (s)	10.6	1.4	7.0	2.3	2.2
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.1
Stop Del/Veh (s)	8.4	0.1	5.7	0.1	0.2

TRAFFIC IMPACT ANALYSIS

SAN ANTONIO WATER HEADQUARTERS PROJECT

CITY OF UPLAND

SAN BERNARDINO COUNTY, CALIFORNIA

This Traffic Impact Analysis has been prepared under the supervision of
Ambarish Mukherjee, P.E.

LSA

November 2024

TRAFFIC IMPACT ANALYSIS

SAN ANTONIO WATER HEADQUARTERS PROJECT

CITY OF UPLAND

SAN BERNARDINO COUNTY, CALIFORNIA

Prepared for:

Alan French, Principal Engineer
City of Upland
460 North Euclid Avenue
Upland, California 91786

Prepared by:

LSA
1500 Iowa Avenue, Suite 200
Riverside, California 92507
(951) 781-9310

Project No. 20241723

LSA

November 2024

TABLE OF CONTENTS

FIGURES AND TABLES iii
LIST OF ABBREVIATIONS AND ACRONYMS iv
1.0 EXECUTIVE SUMMARY 1-1
1.1 EXISTING CONDITIONS SUMMARY 1-2
1.2 OPENING YEAR (2027) CONDITIONS SUMMARY 1-2
1.3 HORIZON YEAR (2050) CONDITIONS SUMMARY 1-2
1.4 CALIFORNIA ENVIRONMENTAL QUALITY ACT ASSESSMENT—VEHICLE MILES TRAVELED ANALYSIS AND ACTIVE TRANSPORTATION AND PUBLIC TRANSIT ANALYSIS SUMMARY 1-2
1.4.1 Vehicle Miles Traveled Analysis Summary 1-2
1.4.2 Active Transportation and Public Transit Analysis Summary 1-3
1.5 Recommended Improvements SUMMARY 1-3
2.0 INTRODUCTION 2-1
2.1 PROJECT DESCRIPTION 2-1
2.2 LIST OF CHAPTER 2.0 FIGURES 2-2
3.0 ANALYSIS METHODOLOGY AND CRITERIA 3-1
3.1 LEVEL OF SERVICE DEFINITIONS 3-1
3.2 LEVEL OF SERVICE PROCEDURES AND CRITERIA 3-1
3.3 LIST OF CHAPTER 3.0 TABLES 3-1
4.0 EXISTING CONDITIONS 4-1
4.1 STUDY AREA 4-1
4.1.1 Study Intersections 4-1
4.2 EXISTING ROADWAY NETWORK 4-1
4.3 BICYCLE, PEDESTRIAN, TRANSIT, AND TRUCK FACILITIES 4-2
4.3.1 Bicycle Facilities 4-2
4.3.2 Pedestrian Facilities 4-2
4.3.3 Transit Facilities 4-2
4.3.4 Truck Facilities 4-2
4.4 EXISTING TRAFFIC VOLUMES 4-3
4.5 EXISTING LEVELS OF SERVICE 4-3
4.5.1 Study Intersections 4-3
4.6 LIST OF CHAPTER 4.0 FIGURES AND TABLES 4-3
5.0 PROJECT TRAFFIC 5-1
5.1 PROJECT TRIP GENERATION 5-1
5.1.1 Employee Trip Generation 5-1
5.1.2 Customer Trip Generation 5-2
5.2 PROJECT TRIP DISTRIBUTION AND ASSIGNMENT 5-2
5.3 LIST OF CHAPTER 5.0 FIGURES AND TABLES 5-2
6.0 OPENING YEAR ANALYSIS 6-1
6.1 OPENING YEAR (2027) WITHOUT PROJECT TRAFFIC VOLUMES 6-1

6.2 OPENING YEAR (2027) PLUS PROJECT TRAFFIC VOLUMES 6-1
6.3 OPENING YEAR (2027) WITHOUT PROJECT LEVELS OF SERVICE 6-1
6.3.1 Study Intersections 6-1
6.4 OPENING YEAR (2027) PLUS PROJECT LEVELS OF SERVICE 6-1
6.4.1 Study Intersections 6-1
6.5 LIST OF CHAPTER 6.0 FIGURES AND TABLES 6-2
7.0 HORIZON YEAR ANALYSIS 7-1
7.1 HORIZON YEAR (2050) WITHOUT PROJECT TRAFFIC VOLUMES 7-1
7.2 HORIZON YEAR (2050) PLUS PROJECT TRAFFIC VOLUMES 7-1
7.3 HORIZON YEAR (2050) WITHOUT PROJECT LEVELS OF SERVICE 7-1
7.3.1 Study Intersections 7-1
7.4 HORIZON YEAR (2050) PLUS PROJECT LEVELS OF SERVICE 7-1
7.4.1 Study Intersections 7-1
7.5 LIST OF CHAPTER 7.0 FIGURES AND TABLES 7-1
8.0 SITE ACCESS ANALYSIS 8-1
8.1 SIGHT DISTANCE ANALYSIS 8-1
8.2 BICYCLE, PEDESTRIAN, AND TRANSIT ACCESSIBILITY 8-2
8.2.1 Bicycle Accessibility 8-2
8.2.2 Pedestrian Accessibility 8-2
8.2.3 Transit Accessibility 8-2
8.3 LIST OF CHAPTER 8.0 FIGURES 8-2
9.0 CEQA ASSESSMENT—VEHICLE MILES TRAVELED ANALYSIS AND ACTIVE TRANSPORTATION AND PUBLIC TRANSIT ANALYSIS 9-1
9.1 VEHICLE MILES TRAVELED ANALYSIS 9-1
9.2 ACTIVE TRANSPORTATION AND PUBLIC TRANSIT ANALYSIS 9-1
10.0 CIRCULATION IMPROVEMENTS AND FUNDING SOURCES 10-1
10.1 RECOMMENDED IMPROVEMENTS 10-1

APPENDICES

A: SCOPING AGREEMENT
B: TRAFFIC COUNT SHEETS
C: VOLUME DEVELOPMENT WORKSHEETS
D: INTERSECTION LEVEL OF SERVICE WORKSHEETS

FIGURES AND TABLES

FIGURES

Figure 2-1: Regional and Project Location 2-3
Figure 2-2: Conceptual Site Plan 2-4
Figure 4-1: Study Area Intersections 4-4
Figure 4-2: Existing Study Intersection Geometrics and Traffic Control 4-5
Figure 4-3: Study Intersection Geometrics and Traffic Control under 'Without Project' Scenarios 4-6
Figure 4-4: Study Intersection Geometrics and Traffic Control under 'Plus Project' Scenarios 4-7
Figure 4-5: City of Upland Roadway Classification 4-8
Figure 4-6: City of Upland Bicycle Routes 4-9
Figure 4-7: City of Upland Pedestrian Facilities 4-10
Figure 4-8: City of Upland Truck Routes 4-11
Figure 4-9: Existing Peak Hour Traffic Volumes 4-12
Figure 5-1: Project Trip Distribution – Employees 5-3
Figure 5-2: Project Trip Distribution – Maintenance Trucks 5-4
Figure 5-3: Project Trip Distribution – Customers 5-5
Figure 5-4: Project Trip Assignment – Employees 5-6
Figure 5-5: Project Trip Assignment – Maintenance Trucks 5-7
Figure 5-6: Project Trip Assignment – Customers 5-8
Figure 5-7: Total Project Trip Assignment 5-9
Figure 6-1: Approved and Pending Project Locations 6-3
Figure 6-2: Approved and Pending Project Trip Assignment 6-4
Figure 6-3: Opening Year (2027) without Project Peak Hour Traffic Volumes 6-5
Figure 6-4: Opening Year (2027) plus Project Peak Hour Traffic Volumes 6-6
Figure 7-1: Horizon Year (2050) without Project Peak Hour Traffic Volumes 7-2
Figure 7-2: Horizon Year (2050) plus Project Peak Hour Traffic Volumes 7-3
Figure 8-1: Corner Sight Distance at Project Driveway 1 8-3
Figure 8-2: Corner Sight Distance at Project Driveway 2 8-4
Figure 8-3: Corner Sight Distance at Project Driveway 3 8-5

TABLES

Table 3.A: Intersection Level of Service Definitions 3-2
Table 3.B: Level of Service Criteria for Unsignalized and Signalized Intersections 3-2
Table 4.A: Existing Intersection Levels of Service 4-13
Table 5.A: Project Trip Generation 5-10
Table 6-A: Approved and Pending Projects Trip Generation 6-7
Table 6-B: Opening Year (2027) Intersection Levels of Service 6-8
Table 7.A: Horizon Year (2050) Intersection Levels of Service 7-4

LIST OF ABBREVIATIONS AND ACRONYMS

Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
City	City of Upland
CMP	Congestion Management Plan
General Plan	City of Upland *General Plan 2035*
HCM	Highway Capacity Manual
HDM	Caltrans Highway Design Manual
ITE	Institute of Transportation Engineers
LOS	level(s) of service
mph	mile(s) per hour
PCE	passenger car equivalent
project	San Antonio Water Headquarters Project
SAWCO	San Antonio Water Co.
SBCTA	San Bernardino County Transportation Authority
SCE	Southern California Edison
SR-210	State Route 210
TIA	Traffic Impact Analysis
TPA	Transit Priority Area
VMT	vehicle miles traveled

1.0 EXECUTIVE SUMMARY

The proposed San Antonio Water Headquarters Project (project) in Upland proposes to develop a new 3,698-square-foot San Antonio Water Co. (SAWCO) headquarters and associated improvements, including a 4,066-square-foot maintenance building, a maintenance yard, a driveway, parking, solar cover, landscaping, and utility improvements. The existing water storage tank, pump station, and signal buildings and tower would remain in place.

The project is located at 400 East 20th Street in Upland. In addition, the project site is located in northwest Upland in an area primarily consisting of residential, commercial, and industrial uses. The project site is bound by East 20th Street to the north, Southern California Edison (SCE) easement (open space) to the east, State Route 210 (SR-210) to the south, and Flower Court to the west. There are currently existing structures on the project site: a 1-million-gallon water storage tank located at the northwestern corner of the parcel, a pump station located at the southwestern corner of the parcel, and a signal building and tower located at the southeastern corner of the parcel. The project is anticipated to be completed by 2027.

The project can be accessed via three full-access driveways:

- **Project Driveway 1 on 20th Street:** This westerly driveway along the northern property boundary provides access for SAWCO patrons and customers;

- **Project Driveway 2 on 20th Street:** This driveway is located in the middle of the northeastern corner of the project site and provides access for the SAWCO employee parking area and maintenance facilities; and

- **Project Driveway 3 on Campus Avenue:** This easterly driveway located on the northeastern corner of the project site and will be a future connection with the intersection of Campus Avenue and 20th Street.

The project is forecast to generate 25 net passenger car equivalent (PCE) trips in the a.m. peak hour, 27 net PCE trips in the p.m. peak hour, and 91 net PCE daily trips.

The study area for the project was finalized based on the criteria defined in the City of Upland (City) *Traffic Impact Analysis (TIA) Guidelines* (dated July 2020). Based on the City's TIA Guidelines and discussions with City staff during the scoping agreement process, the study area includes three intersections.

Traffic conditions were examined for the weekday a.m. and p.m. peak-hour conditions under the following scenarios:

- Existing Condition
- Opening Year without Project Conditions
- Opening Year plus Project Conditions
- Horizon Year without Project Conditions

- Horizon Year plus Project Conditions

1.1 EXISTING CONDITIONS SUMMARY

Based on the criteria as discussed in Section 3.2, Level of Service Procedures and Criteria, of this report, all study intersections are currently operating at a satisfactory level of service (LOS) under existing conditions.

1.2 OPENING YEAR (2027) CONDITIONS SUMMARY

Based on the criteria as discussed in Section 3.2, Level of Service Procedures and Criteria, of this report, under both opening year without and plus project conditions, all intersections are forecast to operate at a satisfactory LOS.

1.3 HORIZON YEAR (2050) CONDITIONS SUMMARY

Based on the criteria as discussed in Section 3.2, Level of Service Procedures and Criteria, of this report, under both horizon year without and plus project conditions, all intersections are forecast to operate at a satisfactory LOS.

1.4 CALIFORNIA ENVIRONMENTAL QUALITY ACT ASSESSMENT—VEHICLE MILES TRAVELED ANALYSIS AND ACTIVE TRANSPORTATION AND PUBLIC TRANSIT ANALYSIS SUMMARY

1.4.1 Vehicle Miles Traveled Analysis Summary

A vehicle mile traveled (VMT) analysis was prepared to meet California Environmental Quality Act (CEQA) requirements for the proposed project. The project VMT analysis is prepared consistent with the City's TIA Guidelines. The TIA Guidelines include the VMT screening criteria, VMT analysis methodology, VMT impact thresholds, and VMT mitigation measures (if required) for the City.

The TIA Guidelines provide multiple screening criteria for land use projects. The VMT screening criteria in the "Analysis Methodology" section of the TIA Guidelines were reviewed to determine whether the proposed project could be screened out from a VMT analysis. Following is a brief description of the proposed project in relation to the VMT screening criteria:

- **Project Located in Transit Priority Area (TPA):** The proposed project is not located within a TPA; therefore, this screening criterion does not apply.

- **Residential or Office Project Located in Low-VMT Area:** The project is not a residential or office project; therefore, this criterion does not apply.

- **Project Type (Land Use) Screening:** According to the TIA Guidelines, "Projects generating less than 250 daily vehicle trips" may be presumed to have a less than significant impact. The proposed project is anticipated to generate fewer than 250 daily vehicle trips.

Since the project meets the Project Type (Land Use) Screening criteria, the project is presumed to have less than significant VMT impact and may be screened from a full VMT analysis.

1.4.2 Active Transportation and Public Transit Analysis Summary

The project does not conflict with any existing or proposed bicycle, pedestrian, or public transit facilities. Therefore, it can be considered to conform to all adopted policies, plans, or programs concerning these facilities and will not have a significant impact. It should be noted that at present, there are no proposed service changes in Omnitrans' transit network.

1.5 RECOMMENDED IMPROVEMENTS SUMMARY

Based on the results of the LOS analysis and VMT screening analysis, all study intersections are forecast to operate at a satisfactory LOS under all scenarios and the project is not anticipated to have any significant VMT impact. Therefore, no circulation improvements or VMT related improvements are required for the project.

2.0 INTRODUCTION

The TIA has been prepared for the proposed project to be located at 400 East 20th Street in Upland. The project site is located in northwest Upland in an area primarily consisting of residential, commercial, and industrial uses. The project site is bound by East 20th Street to the north, SCE easement (open space) to the east, SR-210 to the south, and Flower Court to the west. There are currently existing structures on the project site: a 1-million-gallon water storage tank at the northwestern corner of the parcel, a pump station at the southwestern corner of the parcel, and a signal building and tower at the southeastern corner of the parcel. The existing structures will continue to operate and remain on-site after the project is built. Figure 2-1 illustrates the regional and project location. (Figures and tables are located at the end of each chapter.)

This report is intended to satisfy the requirements established by the City of Upland *Traffic Impact Analysis Guidelines for Vehicle Miles Traveled and Level of Service Assessment* (dated July 2020). The scope of work for this TIA, including trip generation, trip distribution, study area, and analysis methodologies, has been approved by City staff via the Scoping Agreement process. A copy of the Scoping Agreement is included in Appendix A.

This study examines traffic operations in the vicinity of the proposed project under the following five scenarios:

- Existing Conditions;
- Project Opening Year without Project Conditions;
- Project Opening Year plus Project Conditions;
- Horizon Year without Project Conditions; and
- Horizon Year plus Project Conditions.

Traffic conditions were examined for the weekday a.m. and p.m. peak-hour conditions. The a.m. peak hour is defined as the 1 hour of highest traffic volumes occurring between 7:00 and 9:00 a.m. The p.m. peak hour is the 1 hour of highest traffic volumes occurring between 4:00 and 6:00 p.m.

2.1 PROJECT DESCRIPTION

The proposed project proposes to develop new 3,698-square-foot SAWCO headquarters and associated improvements including a 4,066-square-foot maintenance building, maintenance yard, driveway, parking, solar cover, landscaping, and utility improvements. The existing water storage tank, pump station, and signal buildings and tower would remain in place. The project is anticipated to be completed by 2027. Figure 2-2 illustrates the conceptual site plan for the proposed project.

As shown on Figure 2-2, the project can be accessed via three full-access driveways:

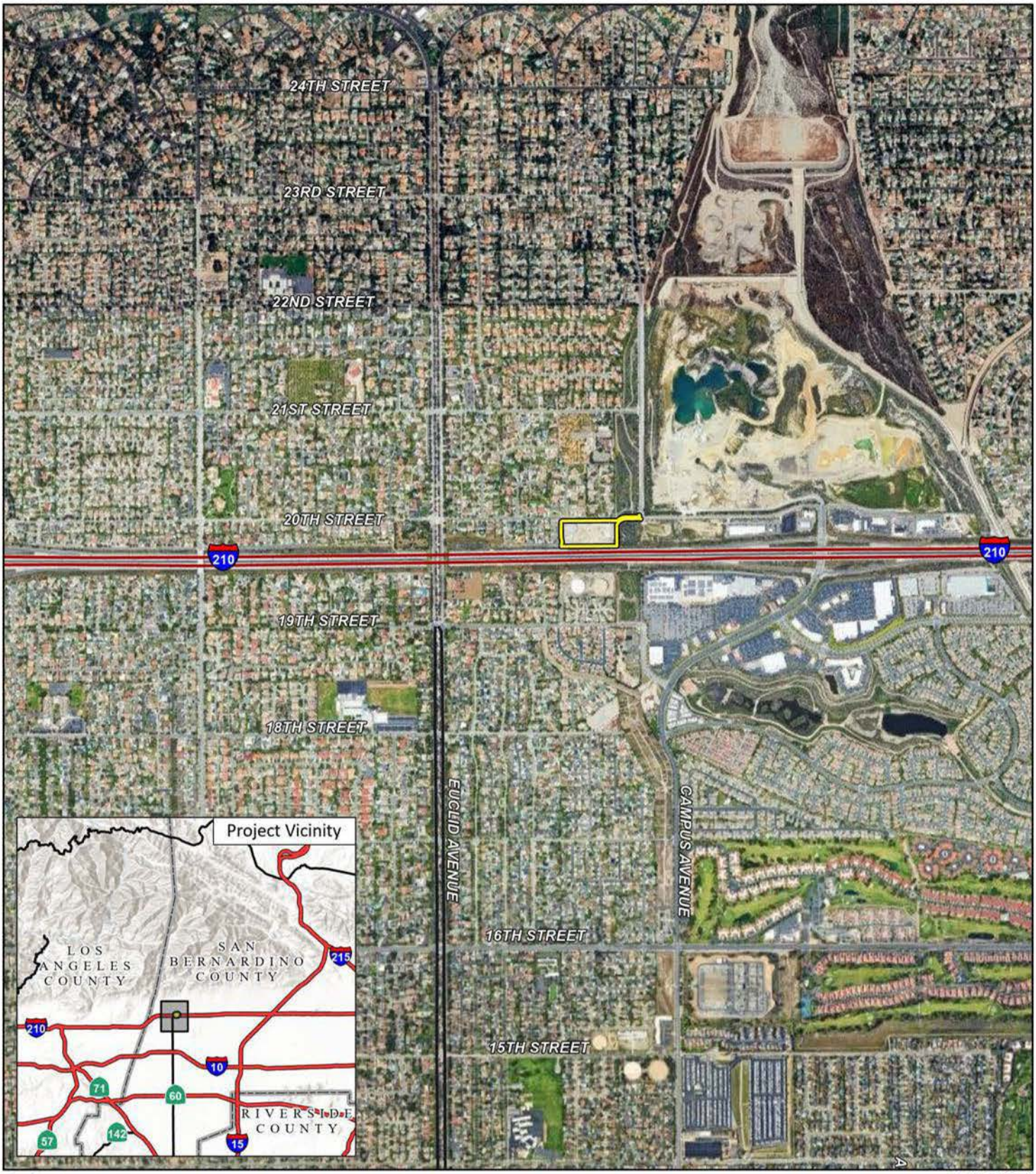
- **Project Driveway 1 on 20th Street:** This westerly driveway along the northern property boundary provides access for SAWCO patrons and customers;

- **Project Driveway 2 on 20th Street:** This driveway is located in the middle of the northeastern corner of the project site and provides access for the SAWCO employee parking area and maintenance facilities; and

- **Project Driveway 3 on Campus Avenue:** This easterly driveway located on the northeastern corner of the project site and will be a future connection with the intersection of Campus Avenue and 20th Street.

2.2 LIST OF CHAPTER 2.0 FIGURES

- Figure 2-1: Regional and Project Location
- Figure 2-2: Conceptual Site Plan



LSA

LEGEND

Project Location

FIGURE 2-1

N

0 830 1660

FEET

SOURCE: ESRI Streetmap, 2021; Google Earth, 2023

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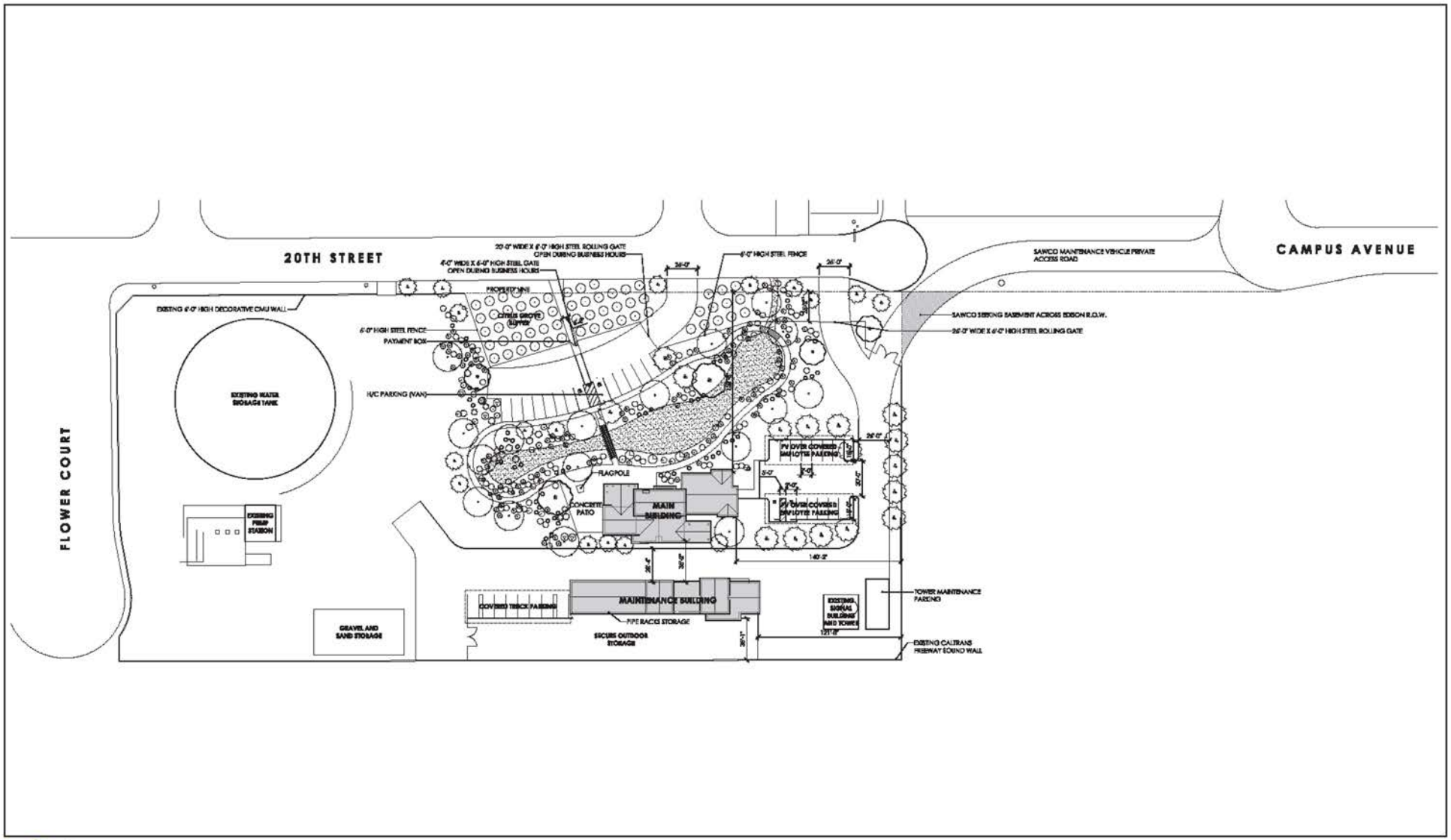
San Antonio Water Headquarters
Traffic Impact Analysis

Regional and Project Location



LSA

FIGURE 2-2

N

0 65 130
FEET

San Antonio Water Headquarters
Traffic Impact Analysis

Conceptual Site Plan

SOURCE: CEDG, Inc., August 2023

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3.0 ANALYSIS METHODOLOGY AND CRITERIA

3.1 LEVEL OF SERVICE DEFINITIONS

Level of service (LOS) can be characterized for the whole intersection, by each intersection approach, and by each lane group. Control delay alone is used to characterize LOS for the entire intersection. Control delay quantifies the increase in travel time due to the traffic signal control and is a surrogate measure of driver discomfort and fuel consumption.

A complete description of the meaning of LOS can be found in the Transportation Research Board Special Report 209, *Highway Capacity Manual* (HCM). The HCM establishes LOS A through F for intersections. A description of LOS for signalized and unsignalized intersections is summarized in Table 3.A.

Table 3.B shows the LOS criteria for unsignalized and signalized intersections. For all study area intersections, the *Highway Capacity Manual 7th Edition* (HCM 7) analysis methodologies were used to determine intersection LOS. Intersection LOS was calculated using the Synchro 12 software, which uses the HCM 7 methodologies.

3.2 LEVEL OF SERVICE PROCEDURES AND CRITERIA

Study intersections analyzed in this report are under the jurisdiction of the City of Upland. The City uses LOS D as its minimum level of service criterion for all intersections.

3.3 LIST OF CHAPTER 3.0 TABLES

- Table 3.A: Intersection Level of Service Definitions
- Table 3.B: Level of Service Criteria for Unsignalized and Signalized Intersections

Table 3.A: Intersection Level of Service Definitions

LOS	Description
A	Traffic operations with a control delay of 10 seconds per vehicle or less and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is exceptionally favorable or the cycle length is very short. If LOS A is the result of favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.
B	Traffic operations with control delay between 10 seconds per vehicle and 20 seconds per vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.
C	Traffic operations with control delay between 20 and 35 seconds per vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when progression is favorable or the cycle length is moderate. Individual cycle failures (i.e., one or more queued vehicles are not able to depart as a result of the insufficient capacity during the cycle) may begin to appear at this level. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.
D	Traffic operations with control delay between 35 and 55 seconds per vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.
E	Traffic operations with control delay between 55 and 80 seconds per vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.
F	Traffic operations with control delay exceeding 80 seconds per vehicle or a volume-to-capacity ratio greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.

Source: Highway Capacity Manual (7th Edition).
LOS = level(s) of service

Table 3.B: Level of Service Criteria for Unsignalized and Signalized Intersections

Level of Service	Unsignalized Intersection Average Delay per Vehicle (sec.)	Signalized Intersection Average Delay per Vehicle (sec.)
A	$\leq$ 10	$\leq$ 10
B	> 10 and $\leq$ 15	> 10 and $\leq$ 20
C	> 15 and $\leq$ 25	> 20 and $\leq$ 35
D	> 25 and $\leq$ 35	> 35 and $\leq$ 55
E	> 35 and $\leq$ 50	> 55 and $\leq$ 80
F	> 50	> 80

Source: *Highway Capacity Manual* (7th Edition).
sec = second(s)

4.0 EXISTING CONDITIONS

4.1 STUDY AREA

Based on the City's TIA Guidelines, at a minimum, the study area must include all freeway links with 100 or more two-way peak-hour project trips and other Congestion Management Plan (CMP) roadways with 50 or more two-way peak-hour project trips within 5 miles of the project site. The project is not anticipated to add 100 or more two-way peak-hour trips to any freeway segment. Therefore, no freeway links were analyzed as part of this analysis. All analysis intersections were approved by the City as part of the scoping process.

4.1.1 Study Intersections

Per the Scoping Agreement (Appendix A), intersections analyzed in this study are as follows:

1. Winston Court–Project Driveway 1/20th Street (Upland);
2. Project Driveway 2/20th Street (Upland); and
3. Campus Avenue/Project Driveway 3–20th Street (Upland);

Figure 4-1 illustrates the locations of all study intersections.

4.2 EXISTING ROADWAY NETWORK

This section provides a description of the circulation network within the study area. Within Upland, all major roadways are classified based on the Existing Roadway System and Classifications provided in the Circulation Element of the City of Upland *General Plan 2035* (General Plan). Following is a brief description of major roadways within the study area:

- **20th Street:** Within the study area, 20th Street is segmented into two separate sections as 20th Street terminates at the SCE easement. The segment of 20th Street west of the SCE easement is a two-lane undivided Collector. The segment of 20th Street east of the SCE easement is a two-lane undivided Secondary Arterial with a posted speed limit of 35 miles per hour (mph). There are no bike facilities along either direction of these segments. There is provision for on-street parking on either side of both segments.

- **Winston Court:** Within the study area, Winston Court is a two-lane undivided local street with a speed limit of 25 mph. Winston Court terminates as a cul-de-sac directly north of the project site. There are no bike facilities along either direction of this segment. There is provision for on-street parking on either side of this segment.

- **Campus Avenue:** Within the study area, Campus Avenue is a two-lane undivided Secondary Arterial with a posted speed limit of 40 mph. There are no bike facilities along either direction of this segment. There is no provision for on-street parking on either side of this segment.

Figure 4-2 illustrates the existing study intersection geometrics and traffic control. Figure 4-3 illustrates the study intersection geometrics and traffic control under future "without project"

scenarios Figure 4-4 illustrates the study intersection geometrics and traffic control under future "plus project" scenarios. Figure 4-5 illustrates the Master Plan of Roadways for the City.

4.3 BICYCLE, PEDESTRIAN, TRANSIT, AND TRUCK FACILITIES

4.3.1 Bicycle Facilities

The City of Upland promotes bicycling for recreation and mobility. Bicycling can be a viable alternative to local work commutes and offers children a healthy way to get to school. To facilitate and encourage bicycle trips, the City has adopted a Bicycle and Pedestrian Master Plan that includes a network of proposed facilities and capital improvement projects.

According to the City of Upland General Plan, the bikeway network within Upland is classified into three categories: Class I – Off-Street Bike Paths and Class II/III – On-Street Bike Lanes. Class I bike routes are physically separated by automobile traffic and may be used by both bicyclists and pedestrians. Class II bike routes are marked routes delineated by signs and striped bicycle lanes. Class III bike routes are similar to Class II bike routes, with the exception that the bicycle lanes are not striped along the facility and are typically delineated with signage.

As part of the City's Bikeway Network, Class III bike routes exist on both directions of Campus Avenue north of SR-210 within the study area. Figure 4-6 illustrates the existing and proposed bikeways within Upland.

4.3.2 Pedestrian Facilities

The implementation of enhanced pedestrian linkage with a comprehensive trails system links residential areas, schools, parks, and commercial centers so that residents can travel within the community without driving. Safe and attractive sidewalks and walkways improve the walkability of Upland. Citywide, sidewalks are generally provided on both sides of the streets. Additionally, standard paved trails and nonstandard unpaved trails are frequently used by bicyclists and pedestrians in the city. Some trails are also available for equestrian riders. The existence of trails and sidewalks provides accessible facilities, provides safety features, and improves walkability in Upland. According to the City's General Plan, the study area on Campus Avenue and 20th Street east of the SCE easement has been identified as areas that needs sidewalks. Figure 4-7 illustrates the pedestrian facilities within the city.

4.3.3 Transit Facilities

Omnitrans is the Public Transit Agency for San Bernardino County and is responsible for coordinating transit services throughout the approximately 480-square-mile service area. Omnitrans provides both local and regional services throughout the region, with 30 fixed routes and 5 OmniGo routes using 178 vehicles. There are no Omnitrans bus routes that operate within the study area.

4.3.4 Truck Facilities

According to the City of Upland General Plan, the City has a specific ordinance (Ordinance No. 1540) that defines weight restrictions, specifies the ability of trucks to enter areas not designated as truck routes, and defines the truck routes within the city. Truck routes are defined by weight restrictions

and classified as "Unrestricted Access," "Restricted to 18 Tons," and "Restricted to 5 Tons." Figure 4-8 illustrates the network of truck routes within Upland.

4.4 EXISTING TRAFFIC VOLUMES

Traffic volumes for existing conditions were developed using existing count data collected by Counts Unlimited in October 2024 at study intersections when schools were in session. Vehicle classification counts were collected at selected study area intersections. Detailed count sheets are included in Appendix B.

Vehicle classification counts were conducted at all study intersections. At these locations, counts were converted to PCE volumes. The concept of PCEs accounts for the larger impact of trucks on traffic operations. It does so by assigning each type of truck a PCE factor that represents the number of passenger vehicles that could travel through an intersection in the same time that a particular type of truck could. PCE volumes at study intersections were computed using a factor of 1.5 for two-axle trucks, 2.0 for three-axle trucks, and 3.0 for trucks with four or more axles, consistent with City of Upland TIA guidelines.

Detailed volume development worksheets are included in Appendix C.

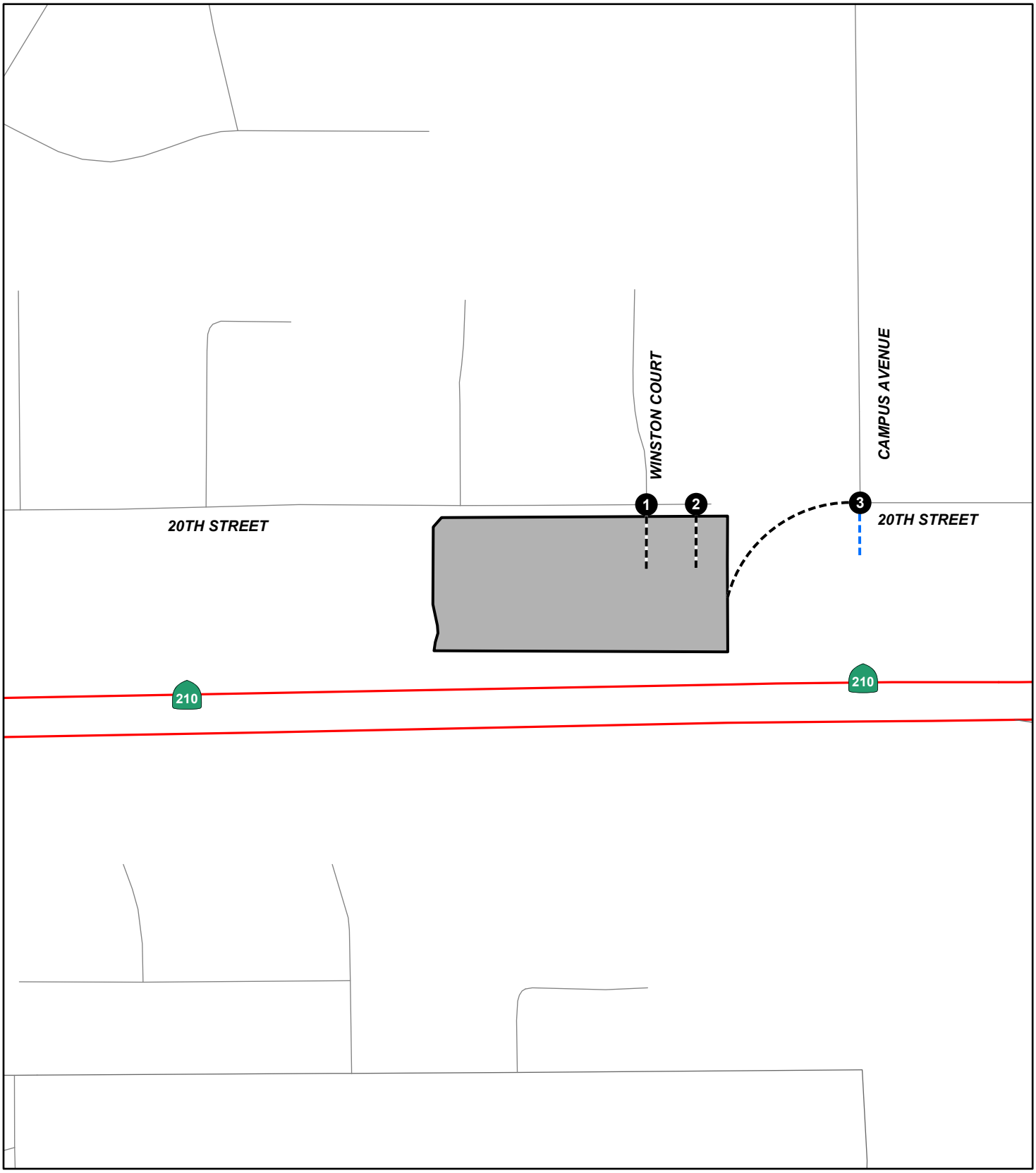
4.5 EXISTING LEVELS OF SERVICE

4.5.1 Study Intersections

An intersection LOS analysis was conducted for existing conditions using the methodologies previously discussed. Table 4.A summarizes the results of this analysis and shows that all intersections are currently operating at a satisfactory LOS under existing conditions. Detailed LOS worksheets are included in Appendix D.

4.6 LIST OF CHAPTER 4.0 FIGURES AND TABLES

- Figure 4-1: Study Area Intersections
- Figure 4-2: Existing Study Intersection Geometrics and Traffic Control
- Figure 4-3: Study Intersection Geometrics and Traffic Control under 'Without Project' Scenarios
- Figure 4-4: Study Intersection Geometrics and Traffic Control under 'Plus Project' Scenarios
- Figure 4-5: City of Upland Roadway Classification
- Figure 4-6: City of Upland Bicycle Routes
- Figure 4-7: City of Upland Pedestrian Facilities
- Figure 4-8: City of Upland Truck Routes
- Figure 4-9: Existing Peak Hour Traffic Volumes
- Table 4.A: Existing Intersection Levels of Service



LSA

LEGEND

- Project Location
- Study Intersections
- Project Driveway
- Future Driveway

0 150 300
FEET

FIGURE 4-1

San Antonio Water Headquarters
Traffic Impact Analysis
Study Area Intersections

SOURCE:

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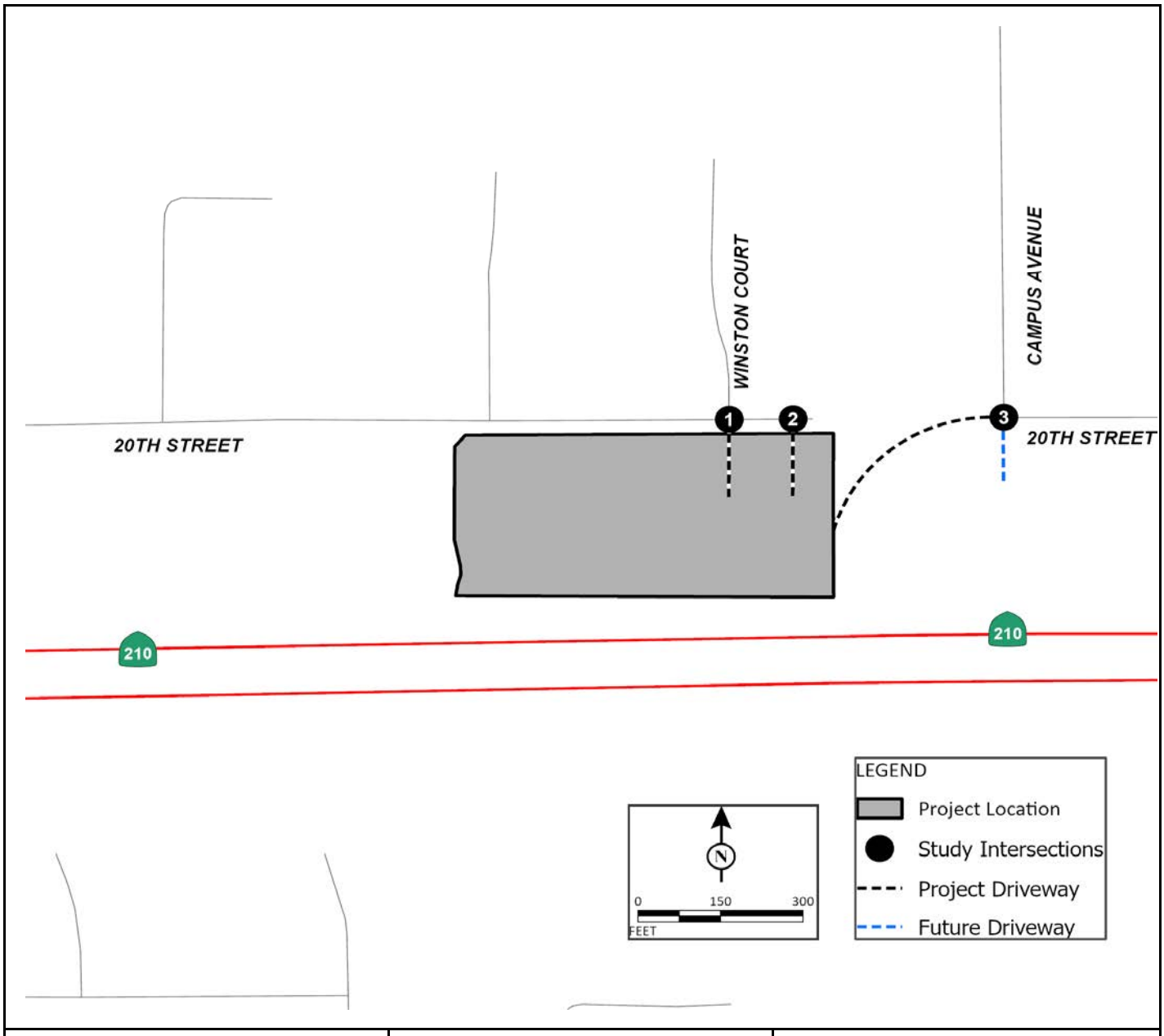
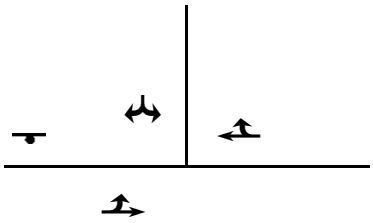
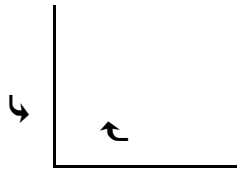




1 **Winston Court - Project Driveway 1/20th Street**

Future Intersection

2 **Project Driveway 2/20th Street**



3 **Campus Avenue/Project Driveway 3 - 20th Street**

FIGURE 4-2

LSA

Legend

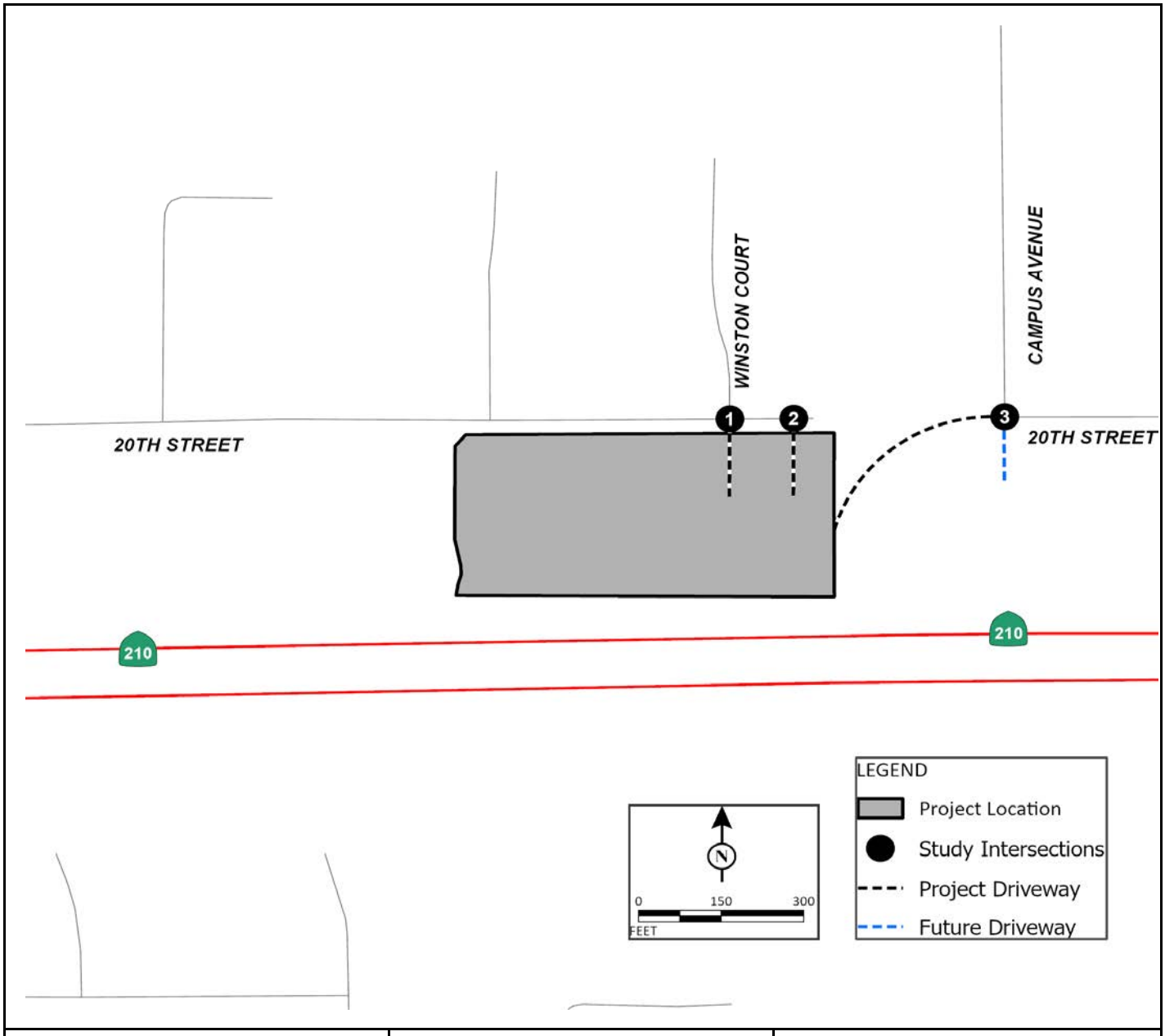
Project Driveway

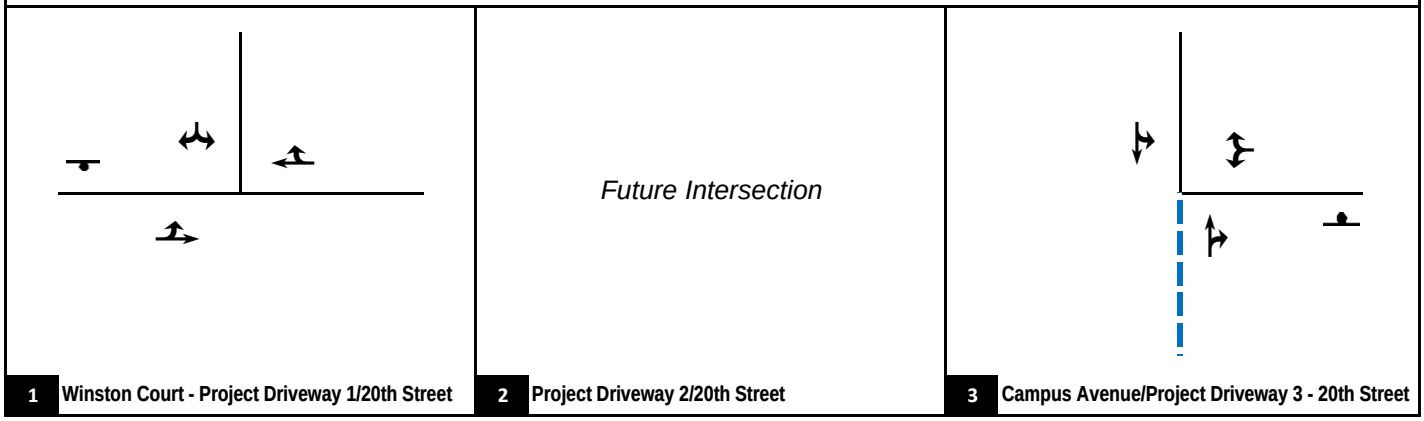
Future Driveway

Stop Sign

San Antonio Water Headquarters
Traffic Impact Analysis

Existing Study Intersection Geometrics and Traffic Control





1 Winston Court - Project Driveway 1/20th Street

2 Project Driveway 2/20th Street

3 Campus Avenue/Project Driveway 3 - 20th Street

FIGURE 4-3

LSA

Legend

Project Driveway

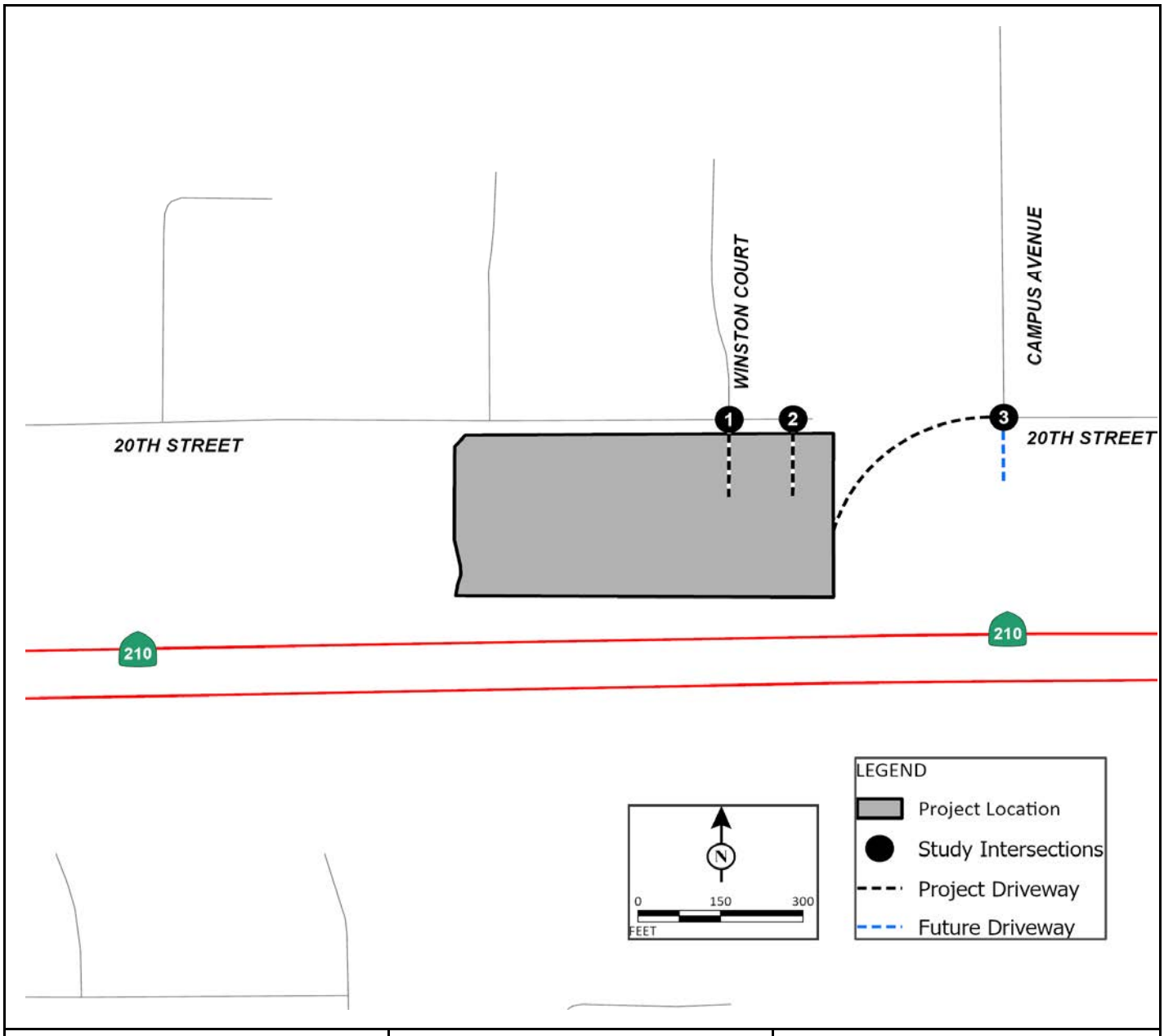
Future Driveway

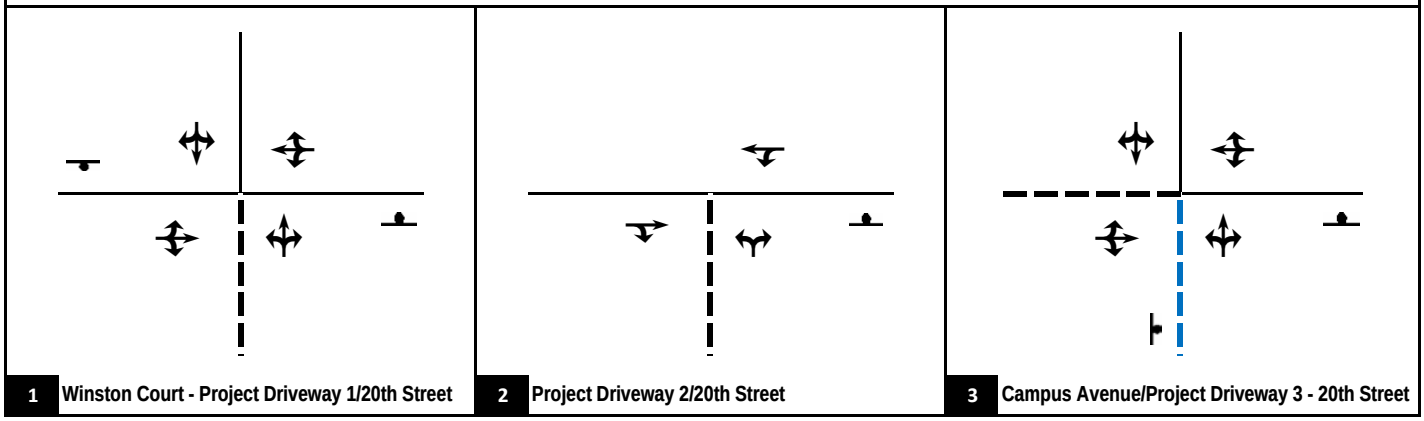
Stop Sign

San Antonio Water Headquarters

Traffic Impact Analysis

Study Intersection Geometrics and Traffic Control under Future 'Without Project' Scenarios





1 Winston Court - Project Driveway 1/20th Street

2 Project Driveway 2/20th Street

3 Campus Avenue/Project Driveway 3 - 20th Street

FIGURE 4-4

LSA

Legend

Project Driveway

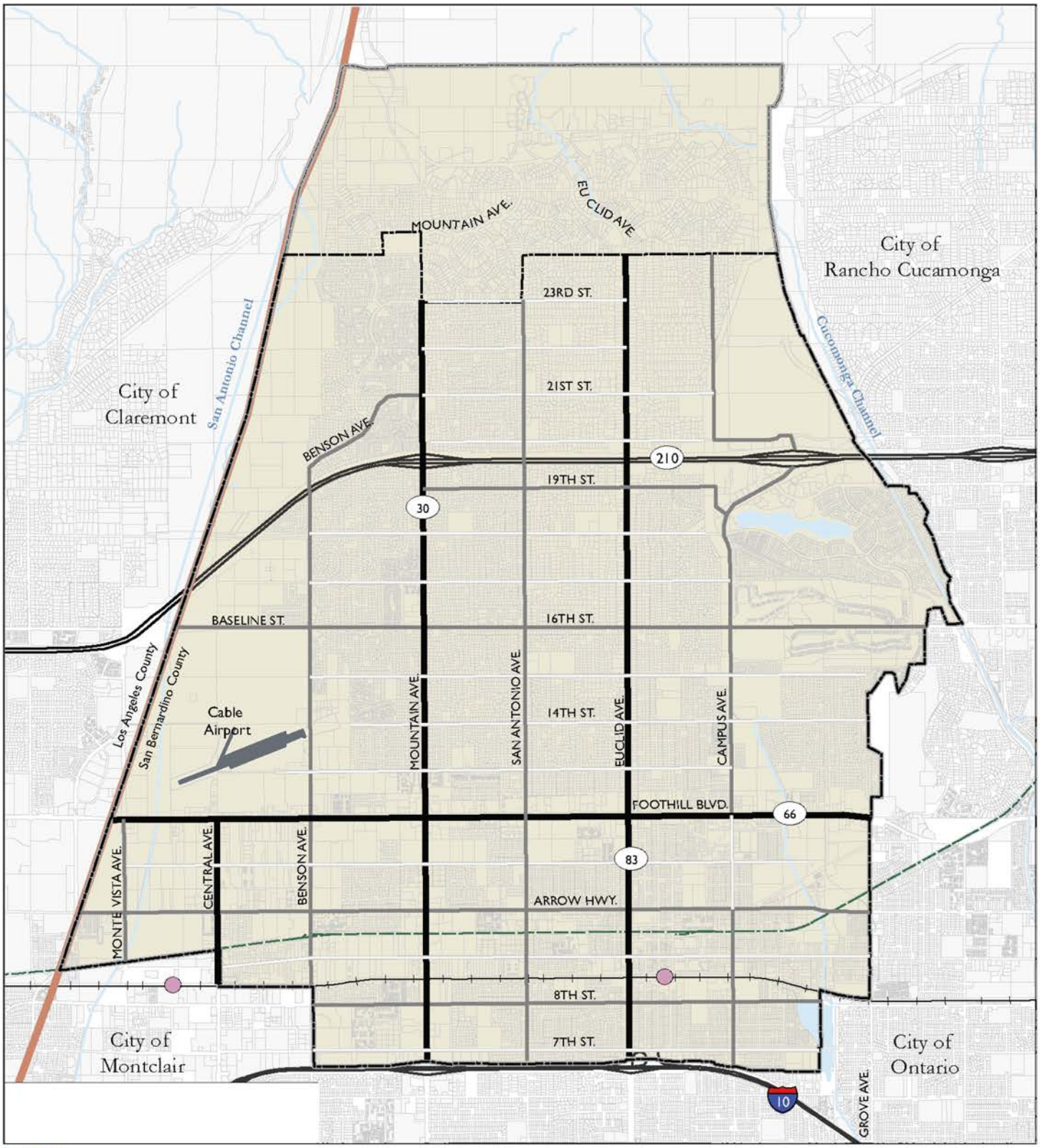
Future Driveway

Stop Sign

San Antonio Water Headquarters

Traffic Impact Analysis

Study Intersection Geometrics and Traffic Control under Future 'Plus Project' Scenarios



LSA

FIGURE 4-5

San Antonio Water Headquarters
Traffic Impact Analysis

City of Upland Roadway Classification

SOURCE: City of Upland General Plan Circulation Element

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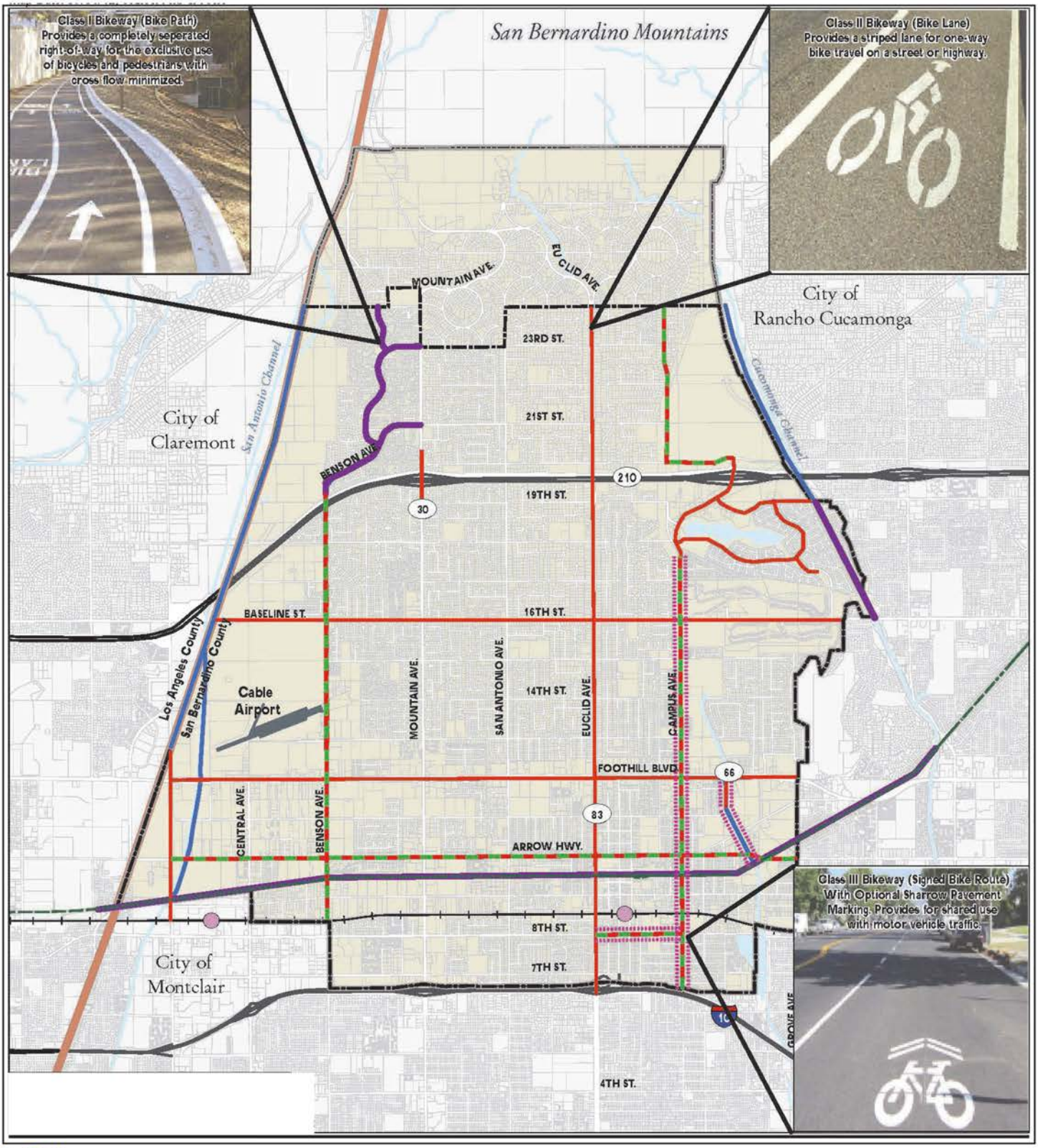

LSA

City Limits
Sphere of Influence
County Boundary
Metrolink Station
Rail Line
Southern Pacific Trail

Existing Bicycle Routes
Class I
Class II/III
Existing Class III; Upgrade to Class II

Future Bicycle Routes
Class I
Priority Bike Lanes*

FIGURE 4-6

San Antonio Water Headquarters
Traffic Impact Analysis

City of Upland Bicycle Routes

SOURCE: City of Upland General Plan Circulation Element

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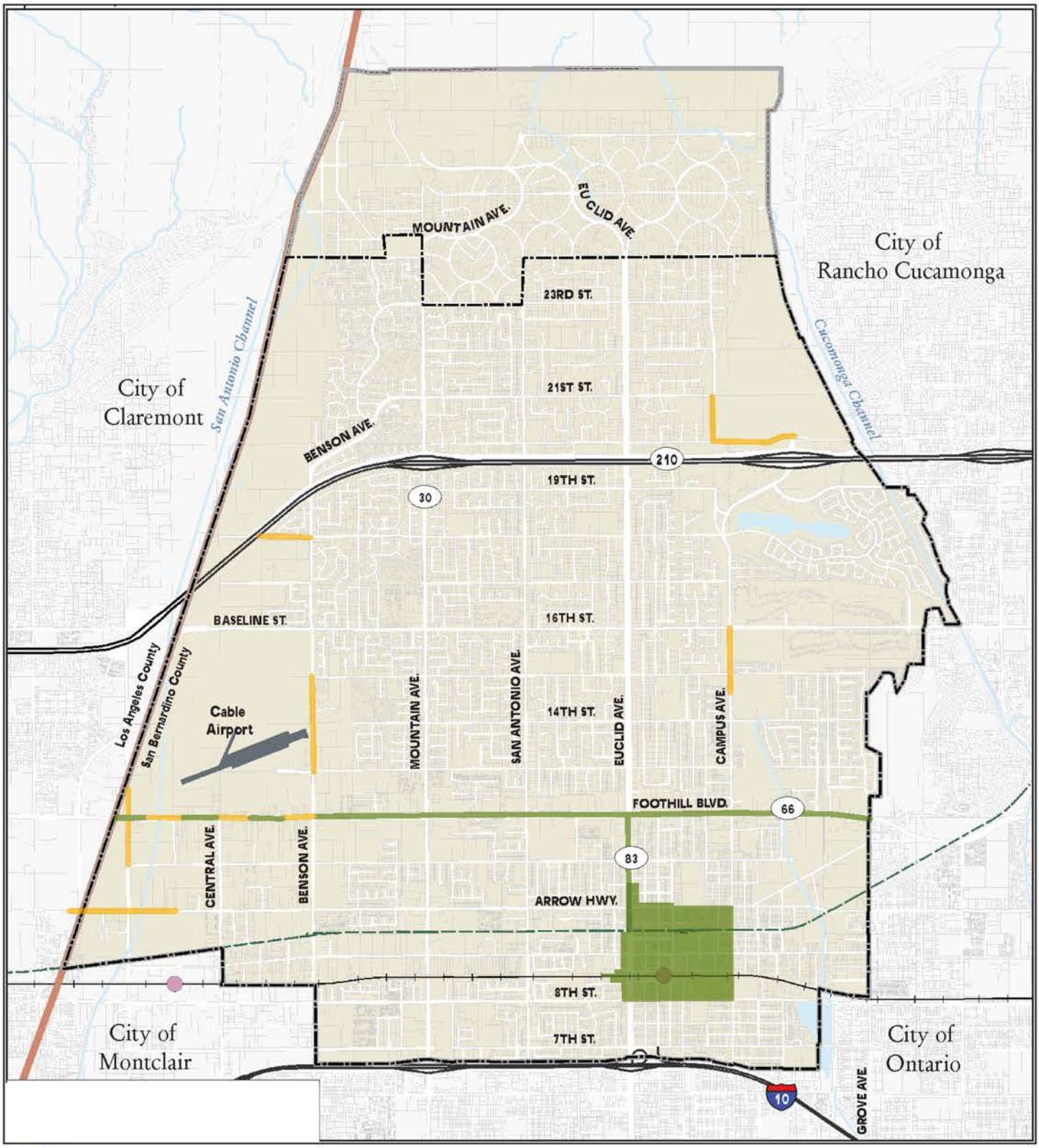

LSA

FIGURE 4-7

County Boundary
Sphere of Influence
City Limits
Upland Parcel
Southern Pacific Trail
Rail Line
Metrolink Station
Pedestrian Multimodal Priority Area*
Pedestrian Needs Priority Area**

N

San Antonio Water Headquarters
Traffic Impact Analysis

City of Upland Pedestrian Facilities

SOURCE: City of Upland General Plan Circulation Element

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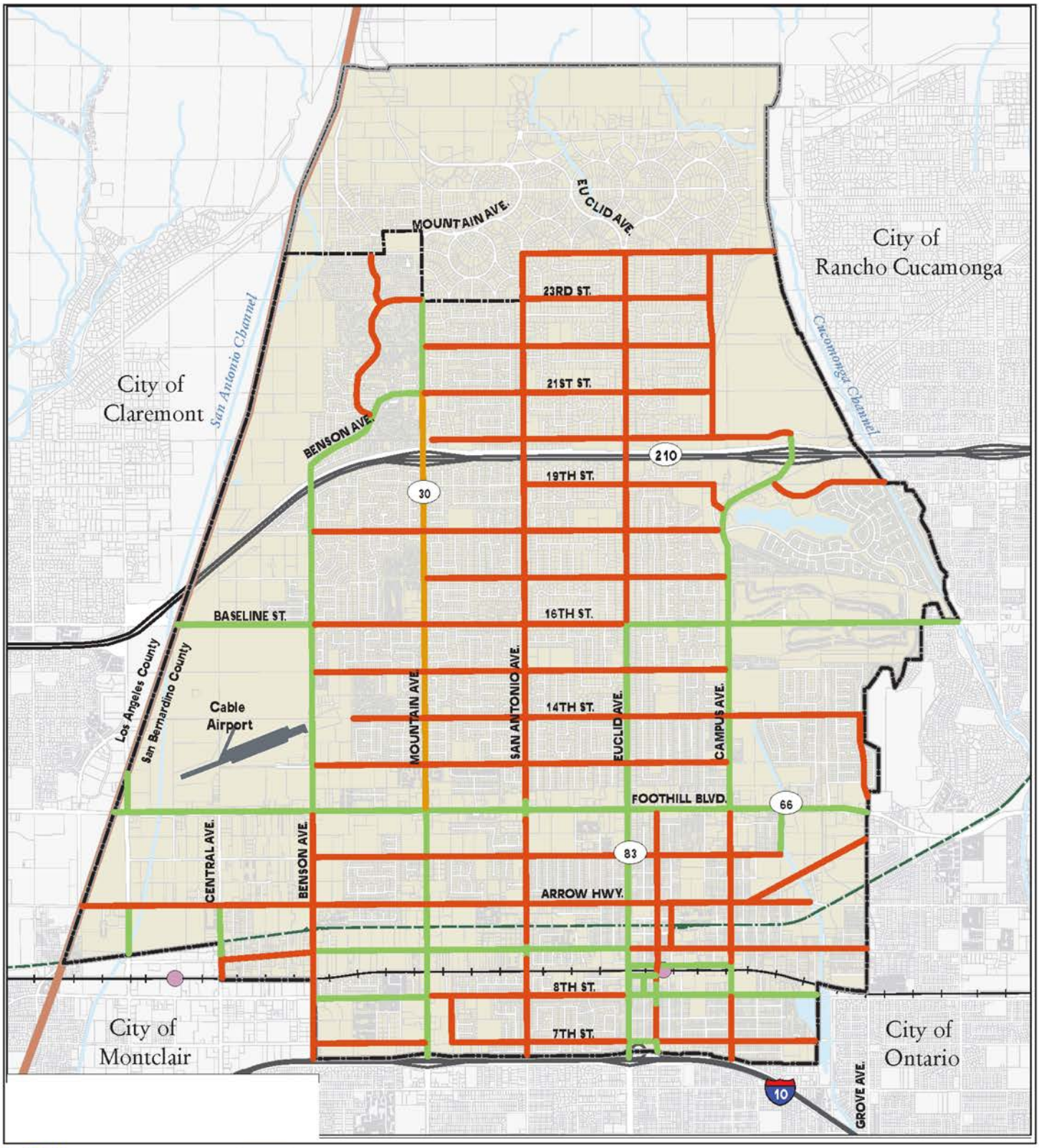

LSA

FIGURE 4-8

San Antonio Water Headquarters
Traffic Impact Analysis

City of Upland Truck Routes

SOURCE: City of Upland General Plan Circulation Element

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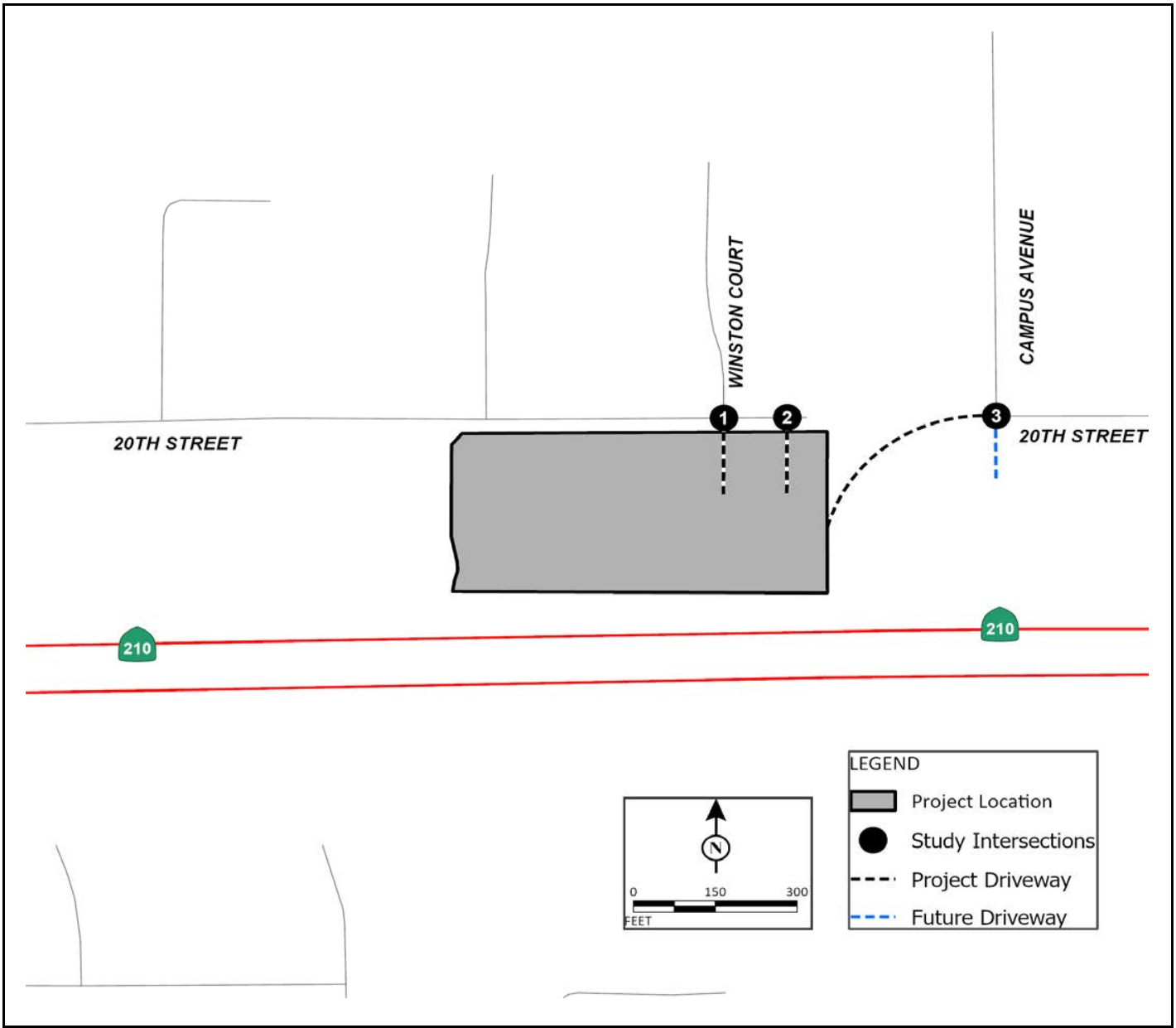
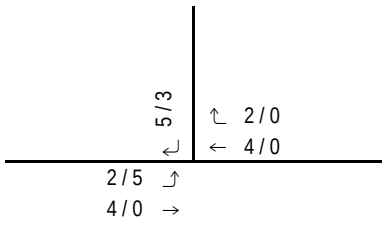
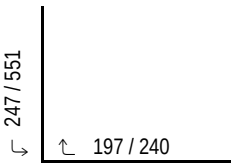




1 **Winston Court - Project Driveway 1/20th Street**

Future Intersection

2 **Project Driveway 2/20th Street**



3 **Campus Avenue/Project Driveway 3 - 20th Street**

FIGURE 4-9

LSA

XXX / YYY
AM / PM PCE Peak Hour Trips

Project Driveway
Future Driveway

San Antonio Water Headquarters
Traffic Impact Analysis

Existing Peak Hour Traffic Volumes

LSA

Table 4.A: Existing Intersection Levels of Service

Intersection	Jurisdiction	LOS Standard	Without Project				
			Control	A.M. Peak Hour		P.M. Peak Hour	
				Delay (sec.)	LOS	Delay (sec.)	LOS
1 . Winston Court - Project Driveway 1/20th Street	Upland	D	OWSC	8.3	A	8.3	A
2 . Project Driveway 2/20th Street	Upland	D	--	*Future Intersection*		*Future Intersection*	
3 . Campus Avenue/Project Driveway 3 - 20th Street	Upland	D	--	*No Conflicting Movements*		*No Conflicting Movements*	

Notes:

OWSC = One-Way Stop Control; LOS = Level of Service

Delay = Average control delay in seconds (For OWSC/TWSC intersections, reported delay is for worst-case movement).

* Exceeds LOS Standard

5.0 PROJECT TRAFFIC

5.1 PROJECT TRIP GENERATION

The trip generation for the proposed project was developed as follows.

5.1.1 Employee Trip Generation

Based on the project description and operational information, the project is anticipated to have 10 full-time employees. For purposes of this analysis, all 10 employees are anticipated to arrive at the facility in the a.m. peak hour and leave the facility in the p.m. peak hour. Therefore, the project is estimated to generate 20 daily employee trips with 10 inbound a.m. peak-hour trips and 10 outbound p.m. peak-hour trips.

Additionally, based on the project description and operational information, the project is anticipated to have six trucks for the operations. Based on information from the applicant, the truck trips are described as followed:

- **Truck #1 (Two-Axle Light-Duty Truck):** This truck is considered a standby vehicle and will average around 80–90 miles per day.
- **Truck #2 (Two-Axle Light-Duty Truck):** Truck #2 is considered a retired standby vehicle/support vehicle for construction jobs and will average around 20–25 miles per day.
- **Truck #3 (Two-Axle Light-Duty Truck):** This truck is considered a general maintenance/support vehicle for construction jobs and will average around 20–25 miles per day. It is likely only to be driven for around 75 percent of work week.
- **Truck #4 (Two-Axle Medium-Duty Truck):** Truck #4 is considered a dump truck. This vehicle will average 20–25 miles per day and is usually only driven about 4–5 days per month.
- **Truck #5 (Two-Axle Medium-Duty Truck):** This truck is considered a service truck and planned to be used for larger construction jobs and heavy maintenance. This vehicle will average around 20–25 miles per day and likely only to be driven for around 75 percent of the work week.
- **Truck #6 (Two-Axle Light-Duty Truck):** This vehicle has an auxiliary fuel tank that will be used for refueling the project's tractors. Occasionally used for short runs for parts and supplies. It will average around 20–25 miles per day and likely only to be driven for around 5–6 days per month.

For purposes of this analysis, all trucks were considered to be two-axle trucks and operating within the same day as a conservative estimate. Therefore, it could be estimated that the project will be generating 12 daily employee truck trips (inbound and outbound combined). Based on the operational hours, these trips could be estimated as peak-hour trips, with six outbound truck trips occurring during a.m. peak hour and six inbound truck trips occurring during the p.m. peak hour. All truck trips were converted to PCE trips using a 1.5 PCE factor for two-axle trucks based on the TIA Guidelines.

5.1.2 Customer Trip Generation

- **Headquarter Building:** The trip generation for this component was developed using rates from the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (11th Edition) for Land Use 712 – "Small Office Building."

The project trip generation is summarized in Table 5.A. As shown in Table 5.A, the project is anticipated to generate 91 total net daily PCE trips, with 25 net PCE trips occurring during the a.m. peak hour and 27 net PCE trips occurring during the p.m. peak hour.

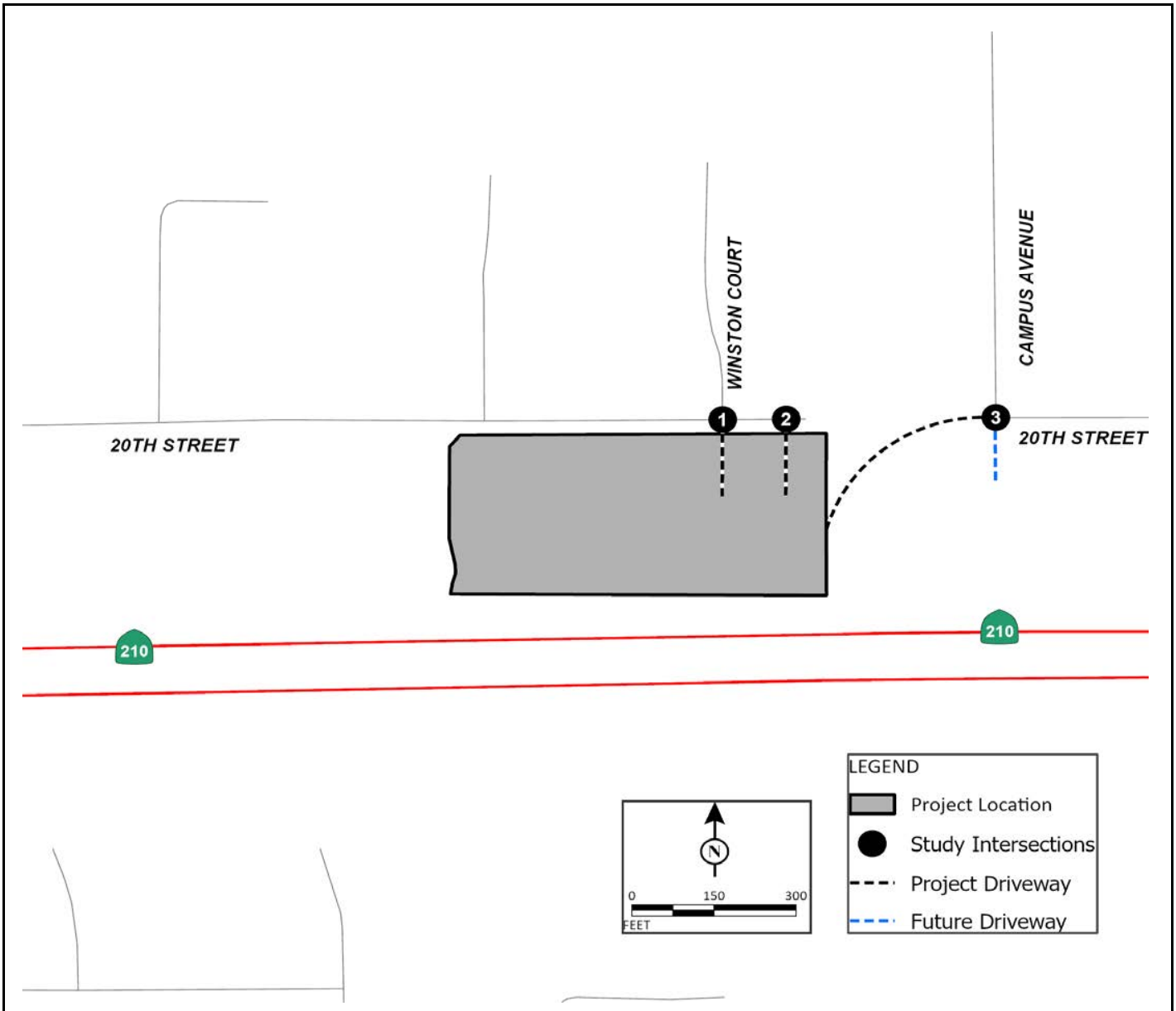
5.2 PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

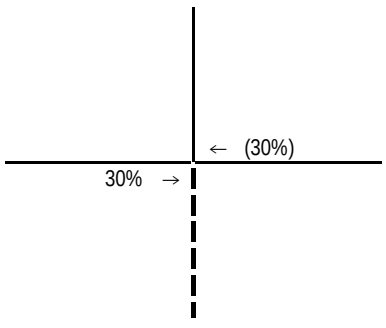
The project trip distribution patterns were based on the regional roadway network and the location of residential, employment, and commercial centers in relation to the proposed project. Figure 5-1 illustrates the project trip distribution for the employees. Figure 5-2 illustrates the project trip distribution for the maintenance trucks. Figure 5-3 illustrates the customer trip distribution.

The project trip assignment at the study intersections is the product of the project trip generation and the corresponding trip distribution percentages. Figure 5-4 illustrates the trip assignment for employees. Figure 5-5 illustrates the trip assignment for maintenance trucks trips. Figure 5-6 illustrates the trip assignment for customers. Figure 5-7 illustrates the total project trip assignment.

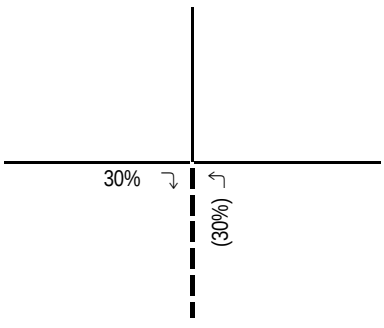
5.3 LIST OF CHAPTER 5.0 FIGURES AND TABLES

- Figure 5-1: Project Trip Distribution – Employees
- Figure 5-2: Project Trip Distribution – Maintenance Trucks
- Figure 5-3: Project Trip Distribution – Customers
- Figure 5-4: Project Trip Assignment – Employees
- Figure 5-5: Project Trip Assignment – Maintenance Trucks
- Figure 5-6: Project Trip Assignment – Customers
- Figure 5-7: Total Project Trip Assignment
- Table 5.A: Project Trip Generation

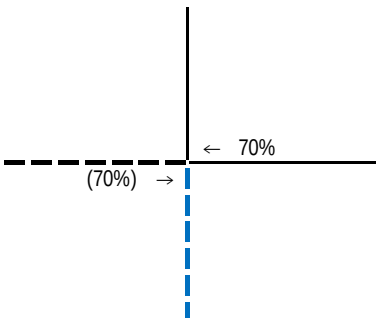




1 **Winston Court - Project Driveway 1/20th Street**



2 **Project Driveway 2/20th Street**



3 **Campus Avenue/Project Driveway 3 - 20th Street**

FIGURE 5-1

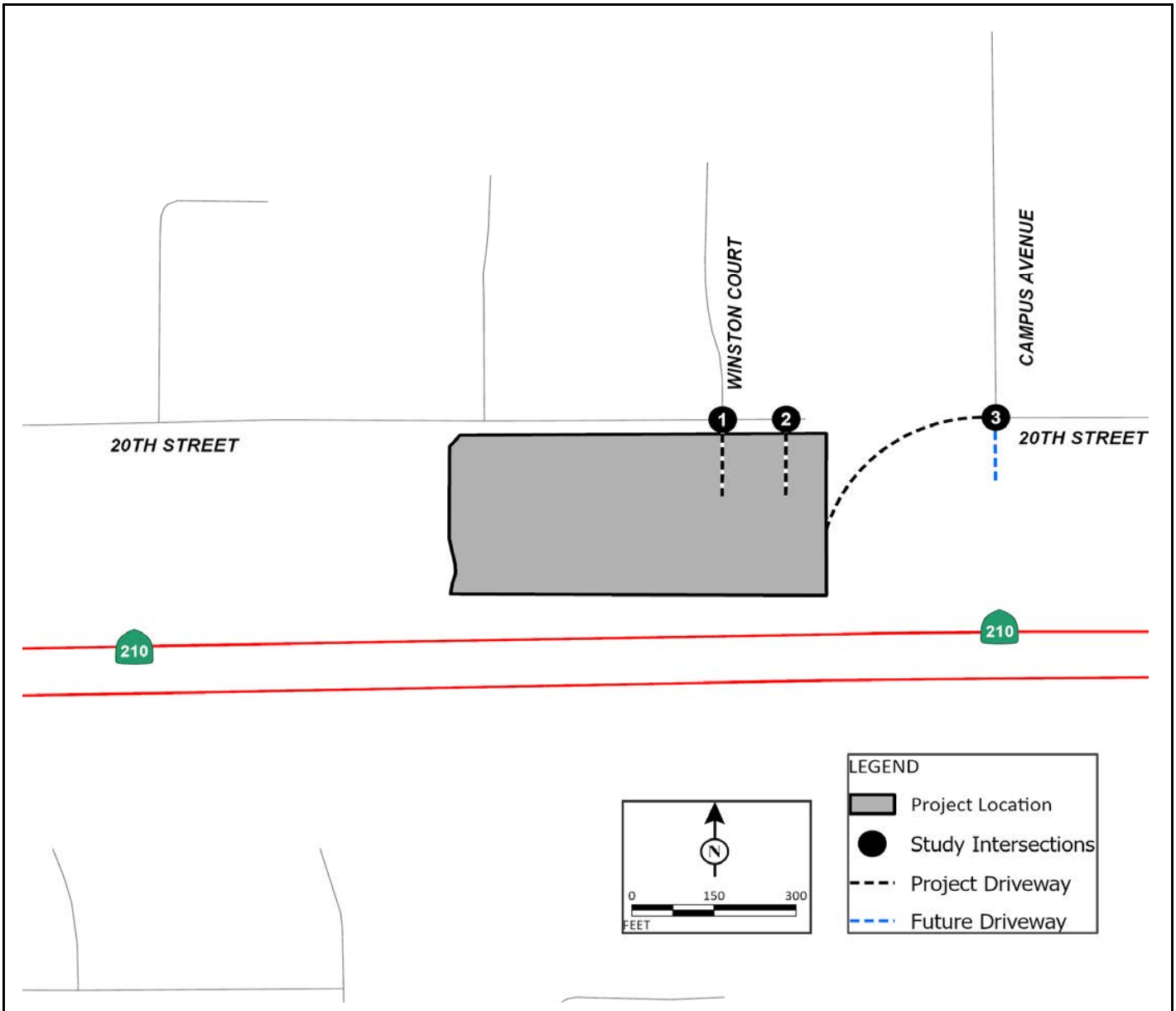
LSA

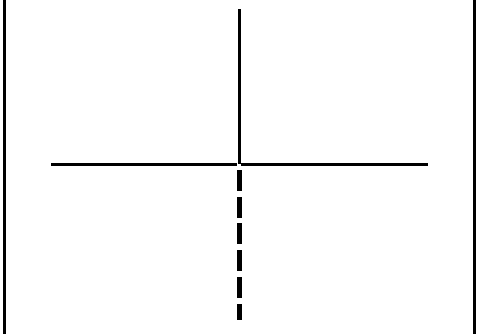
XX% (YY%)
Inbound (Outbound) Distribution

Project Driveway
Future Driveway

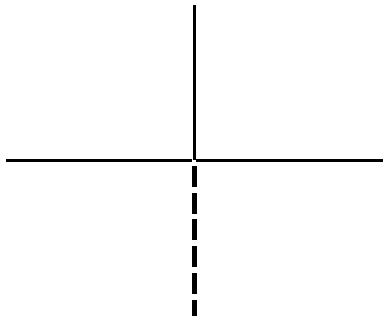
San Antonio Water Headquarters
Traffic Impact Analysis

Project Trip Distribution – Employees

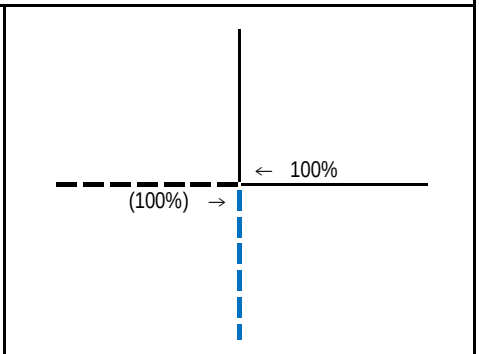




1 **Winston Court - Project Driveway 1/20th Street**



2 **Project Driveway 2/20th Street**



3 **Campus Avenue/Project Driveway 3 - 20th Street**

FIGURE 5-2

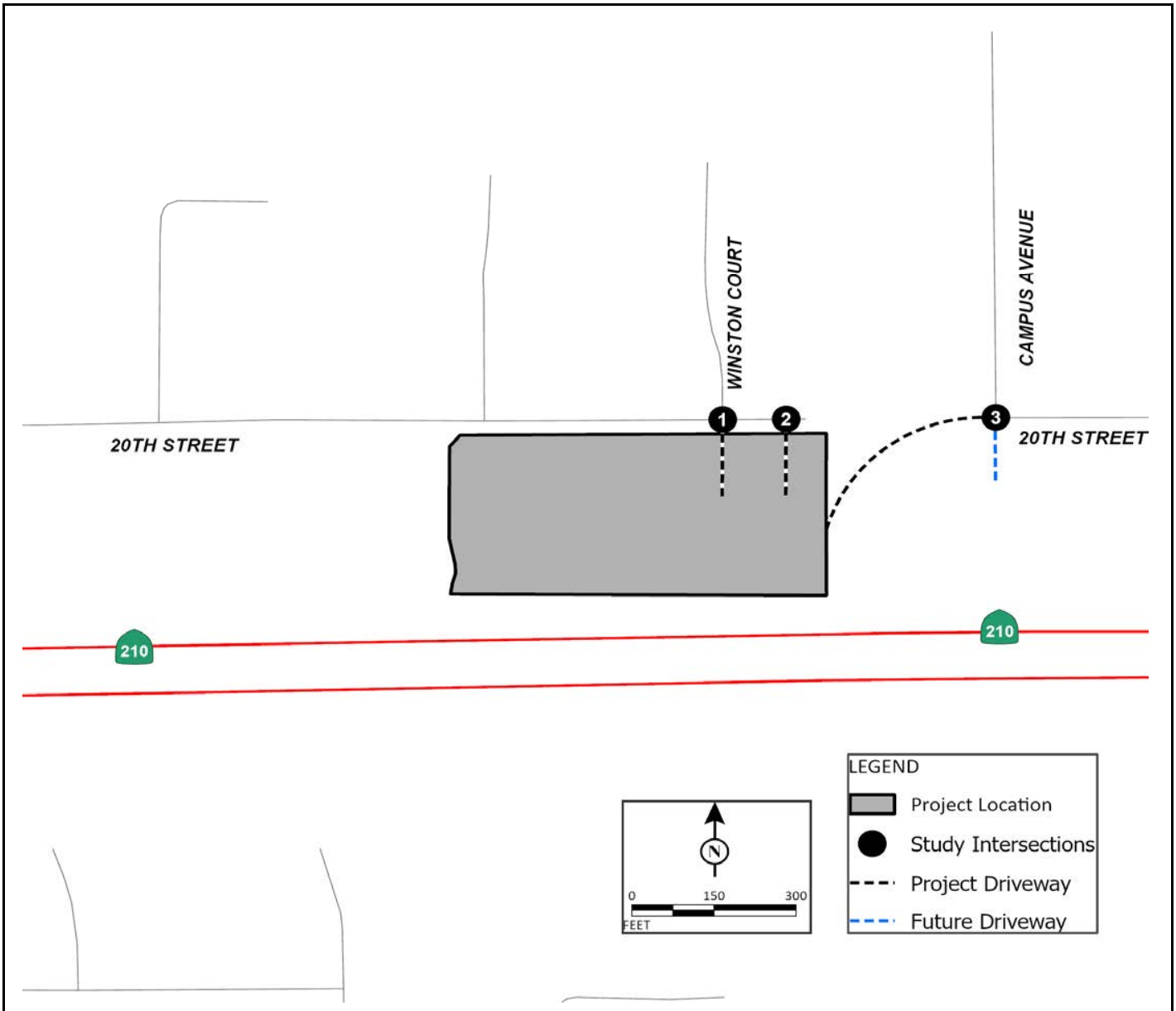
LSA

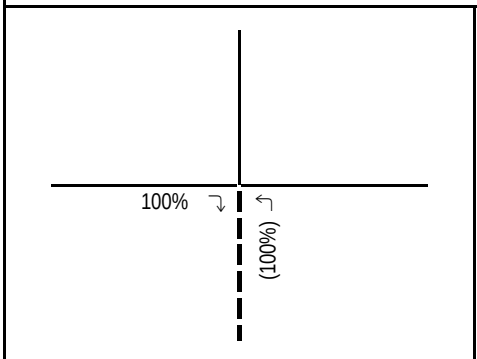
XXX% (YYY%)
Inbound (Outbound) Distribution

Project Driveway
Future Driveway

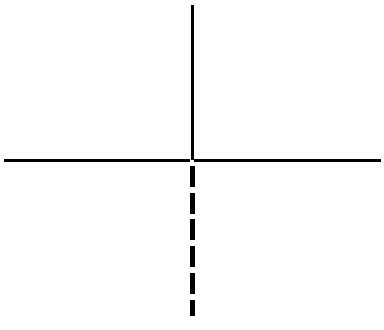
San Antonio Water Headquarters
Traffic Impact Analysis

Project Trip Distribution – Maintenance Trucks

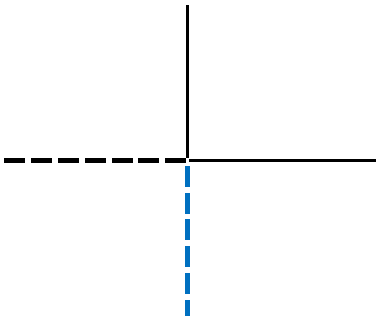




1 **Winston Court - Project Driveway 1/20th Street**



2 **Project Driveway 2/20th Street**



3 **Campus Avenue/Project Driveway 3 - 20th Street**

FIGURE 5-3

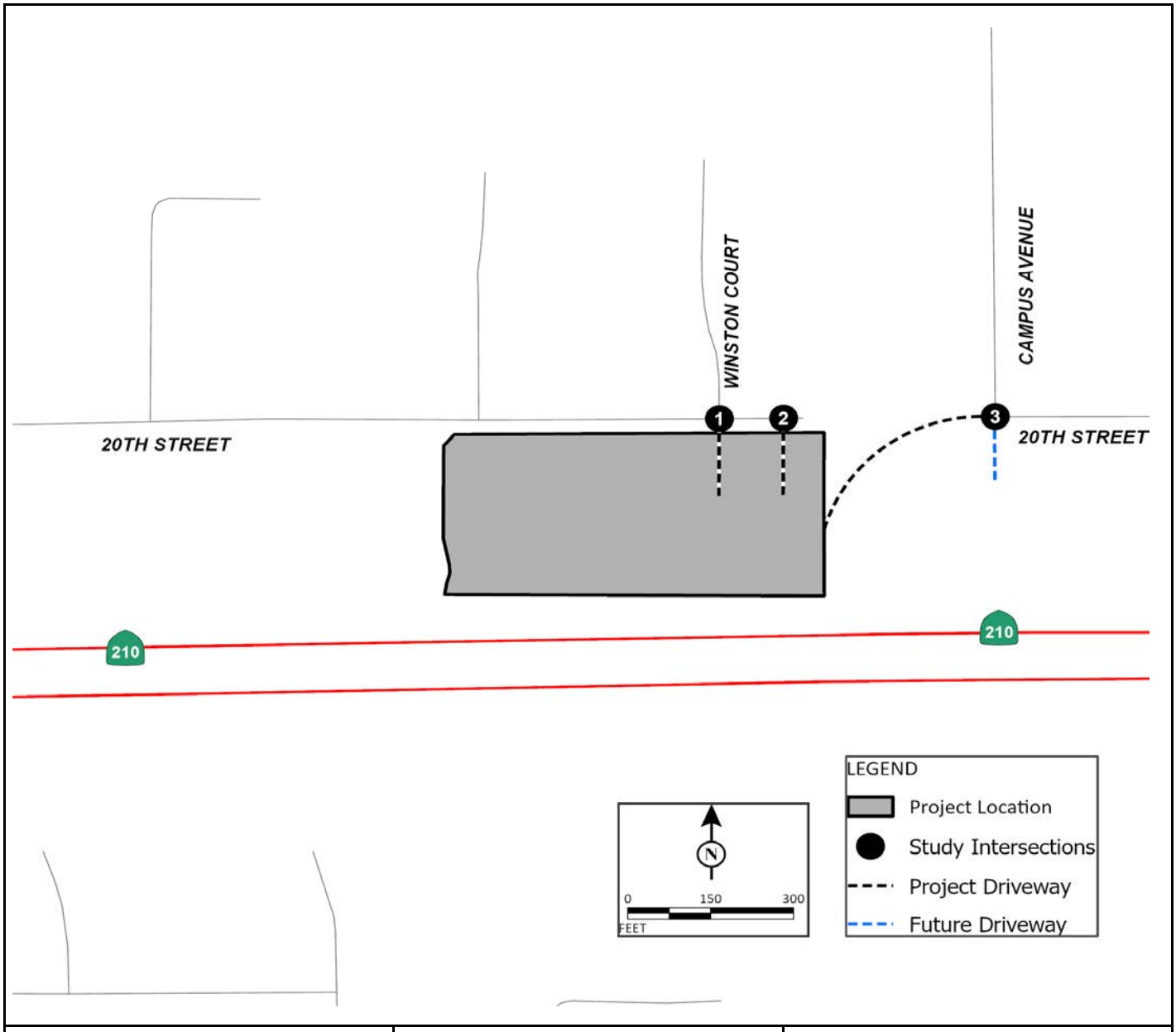
LSA

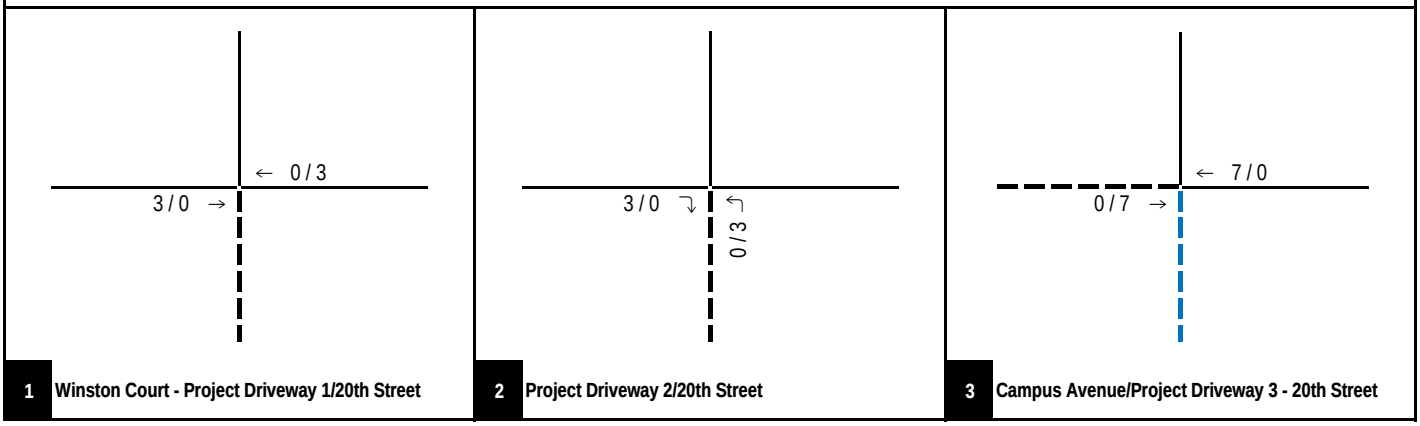
XXX% (YYY%)
Inbound (Outbound) Distribution

Project Driveway
Future Driveway

San Antonio Water Headquarters
Traffic Impact Analysis

Project Trip Distribution – Customers





1 **Winston Court - Project Driveway 1/20th Street**

2 **Project Driveway 2/20th Street**

3 **Campus Avenue/Project Driveway 3 - 20th Street**

FIGURE 5-4

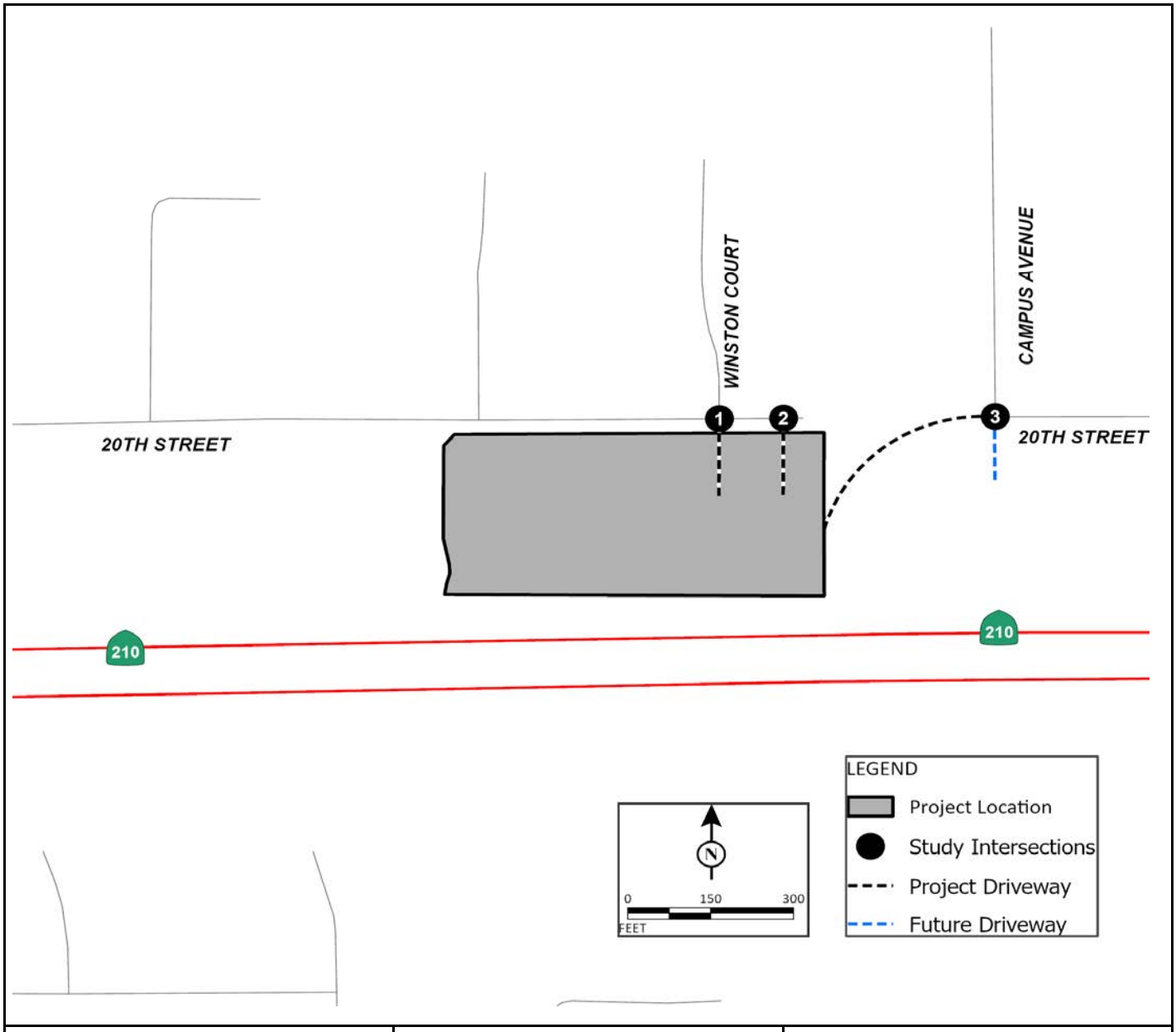
LSA

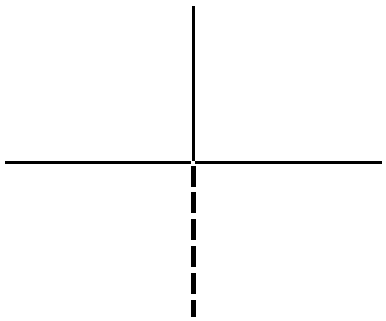
XX / YY
AM / PM Peak Hour Trips

Project Driveway
Future Driveway

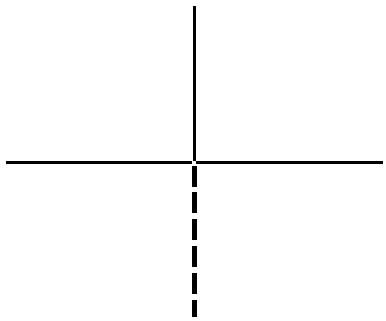
San Antonio Water Headquarters
Traffic Impact Analysis

Project Trip Assignment – Employees

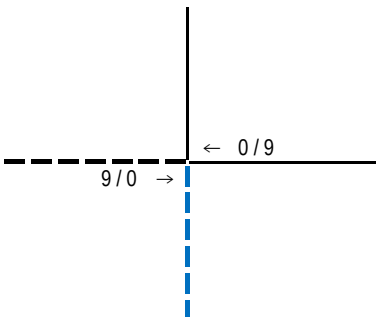




1 **Winston Court - Project Driveway 1/20th Street**



2 **Project Driveway 2/20th Street**



3 **Campus Avenue/Project Driveway 3 - 20th Street**

FIGURE 5-5

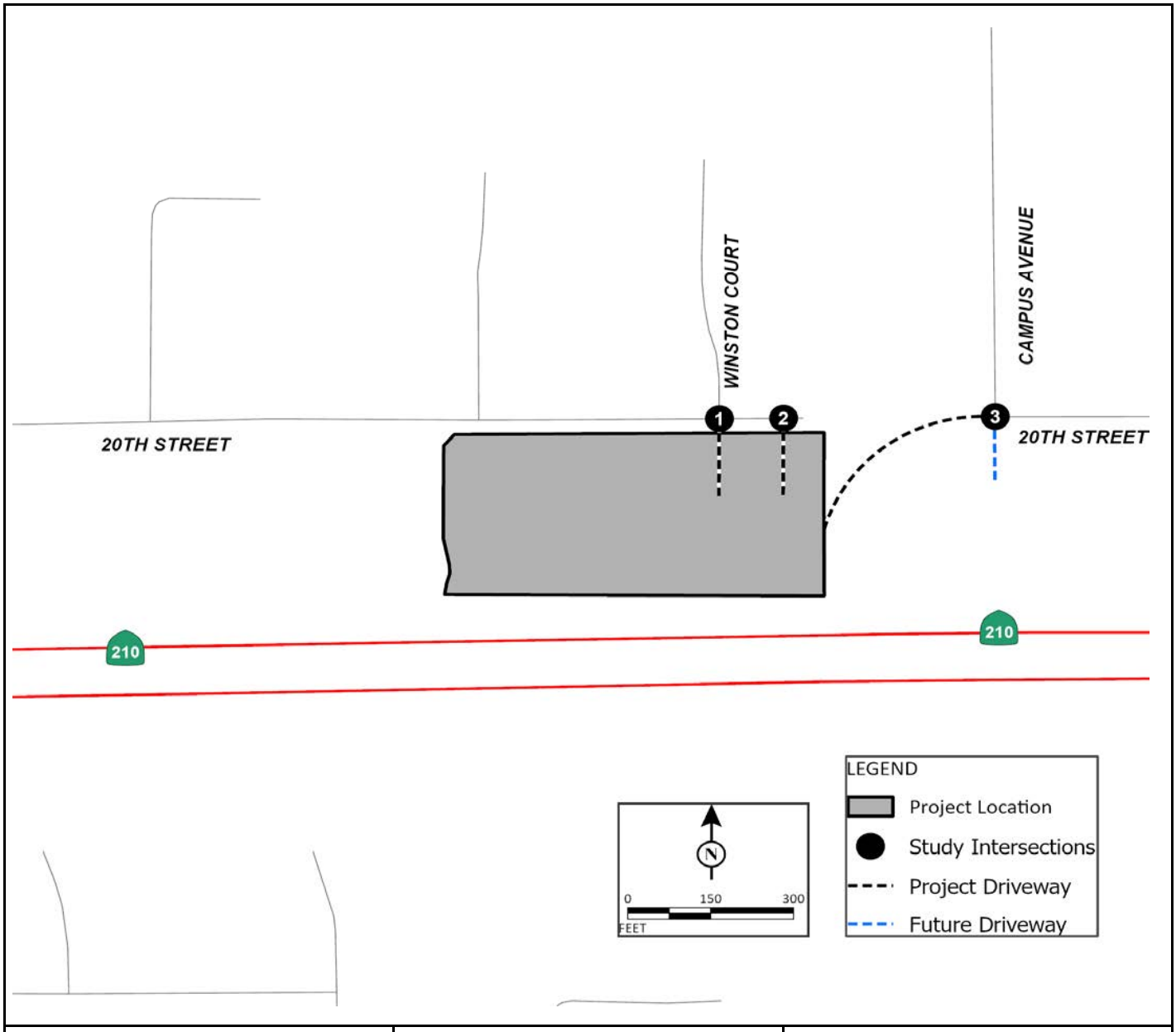
LSA

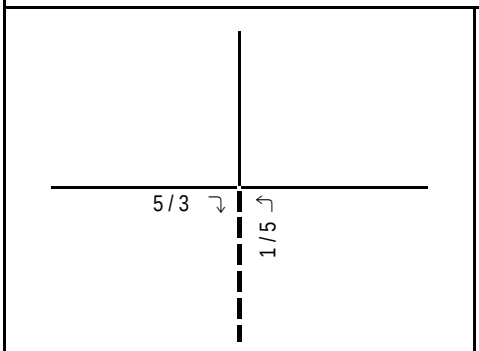
XX / YY
AM / PM Peak Hour PCE Trips

Project Driveway
Future Driveway

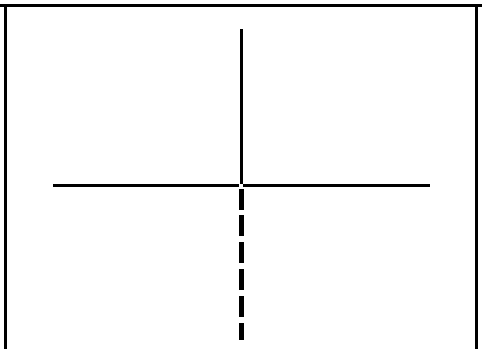
San Antonio Water Headquarters
Traffic Impact Analysis

Project Trip Assignment – Maintenance Trucks

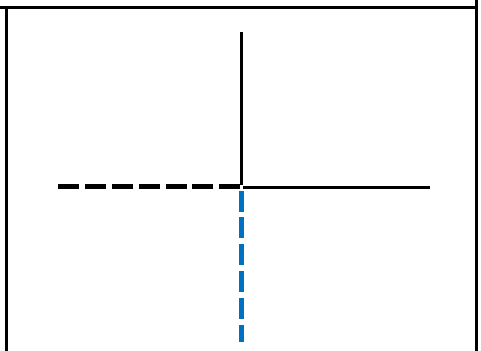




1 **Winston Court - Project Driveway 1/20th Street**



2 **Project Driveway 2/20th Street**



3 **Campus Avenue/Project Driveway 3 - 20th Street**

FIGURE 5-6

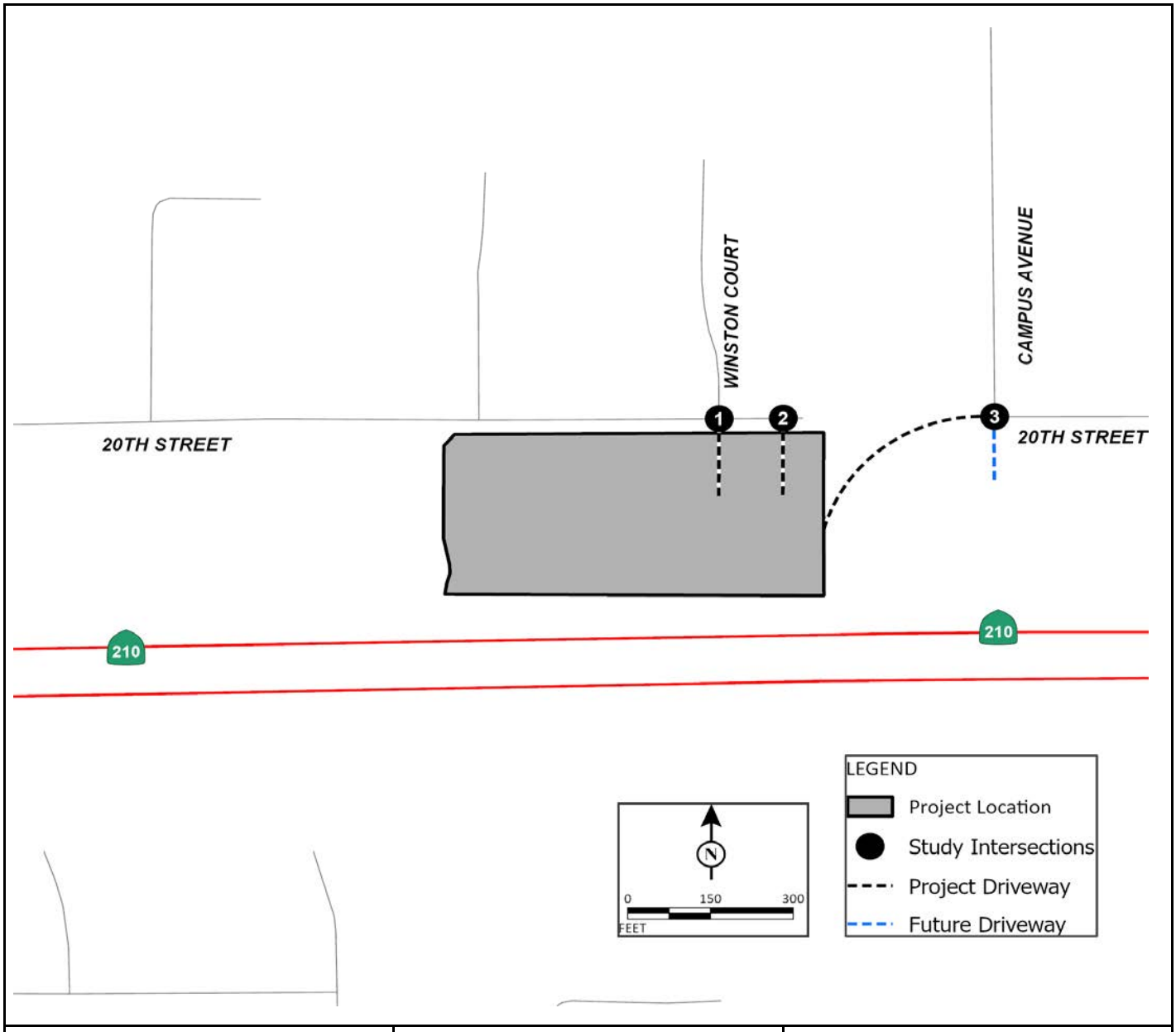
LSA

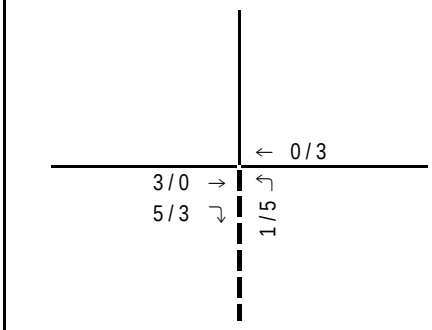
XX / YY
AM / PM Peak Hour Trips

Project Driveway
Future Driveway

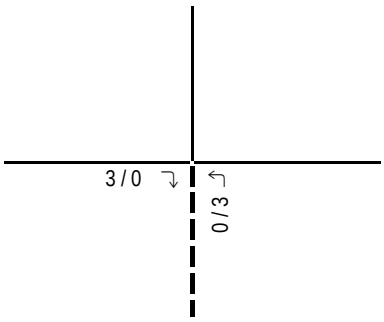
San Antonio Water Headquarters
Traffic Impact Analysis

Project Trip Assignment – Customers

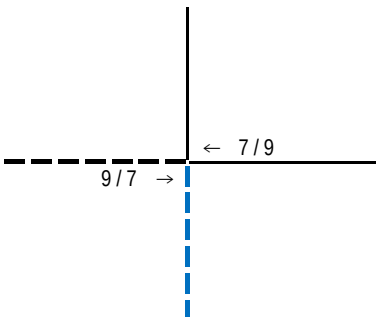




1 **Winston Court - Project Driveway 1/20th Street**



2 **Project Driveway 2/20th Street**



3 **Campus Avenue/Project Driveway 3 - 20th Street**

FIGURE 5-7

LSA

XX / YY
AM / PM Peak Hour PCE Trips

Project Driveway
Future Driveway

San Antonio Water Headquarters
Traffic Impact Analysis

Total Project Trip Assignment

LSA

Table 5.A: Project Trip Generation

Land Uses		Units	A.M. Peak Hour In	A.M. Peak Hour Out	A.M. Peak Hour Total	P.M. Peak Hour In	P.M. Peak Hour Out	P.M. Peak Hour Total	Daily
San Antonio Water Headquarters & Maintenance Buildings									
Employee Trip Generation[1]			10	0	10	0	10	10	20
Employee Maintenance Truck Trip Generation[2]			0	6	6	6	0	6	12
Employee Maintenance Truck PCE Trip Generation[3]			0	9	9	9	0	9	18
Headquarter Building									
Headquarters Building Trip/Unit[4]	3.698	TSF	1.37	0.30	1.67	0.73	1.43	2.16	14.39
Headquarters Building Customer Trip Generation			5	1	6	3	5	8	53
Total PCE Trip Generation			**15**	**10**	**25**	**12**	**15**	**27**	**91**

Notes:

TSF = thousand square-feet

[1] The employee trip generation was developed based on the project description and operational information.

[2] The maintenance truck trip generation was developed based on the project's operational information. All trucks are 2-axle trucks.

[3] All maintenance truck trips were converted to passenger PCEs using a 1.5 PCE factor for 2-axle trucks based on City of Upland's *Traffic Impact Analysis Guidelines* , dated July 2020.

[4] Rates from Institute of Transportation Engineers (ITE) *Trip Generation Manual* , (11th Edition) for Land Use 712 - "Small Office Building" , Setting/Location - 'General Urban/Suburban'.

6.0 OPENING YEAR ANALYSIS

6.1 OPENING YEAR (2027) WITHOUT PROJECT TRAFFIC VOLUMES

As approved during the City's scoping agreement process (Appendix A), traffic volumes for opening year without project conditions were developed by applying a growth of 2 percent per annum to existing traffic volumes and adding trips from approved and pending development projects in the area. This methodology was applied for study intersections. Information concerning approved and pending development projects in the vicinity of the proposed project was obtained from City staff and nearby jurisdictions. Figure 6-1 illustrates the approved and pending development projects' locations. Trip generation for approved and pending development projects was either obtained from the respective traffic studies prepared for the projects or developed using rates from the ITE *Trip Generation Manual* (11th Edition). Table 6.A lists the approved and pending development projects included in this analysis and shows the approved and pending development projects are estimated to generate 232 net trips in the a.m. peak hour, 363 net trips in the p.m. peak hour, and 3,938 net daily trips.

Approved and pending development project trips were assigned to the roadway network based on their locations in relation to surrounding land uses and regional arterials. Figure 6-2 illustrates the total peak-hour approved and pending development project trip assignment at study area intersections. Figure 6-3 illustrates the peak-hour traffic volumes at study intersections under opening year without project conditions.

6.2 OPENING YEAR (2027) PLUS PROJECT TRAFFIC VOLUMES

Opening year plus project traffic volumes were developed by adding proposed project traffic to the opening year without project traffic volumes. Figure 6-4 illustrates the opening year plus project peak-hour traffic volumes at study intersections.

Detailed volume development worksheets are included in Appendix C.

6.3 OPENING YEAR (2027) WITHOUT PROJECT LEVELS OF SERVICE

6.3.1 Study Intersections

An intersection LOS analysis was conducted for opening year without project conditions using the methodologies previously discussed. Table 6.B summarizes the results of the analysis and shows that all intersections are forecast to operate at a satisfactory LOS under opening year without project conditions. Detailed LOS worksheets are included in Appendix D.

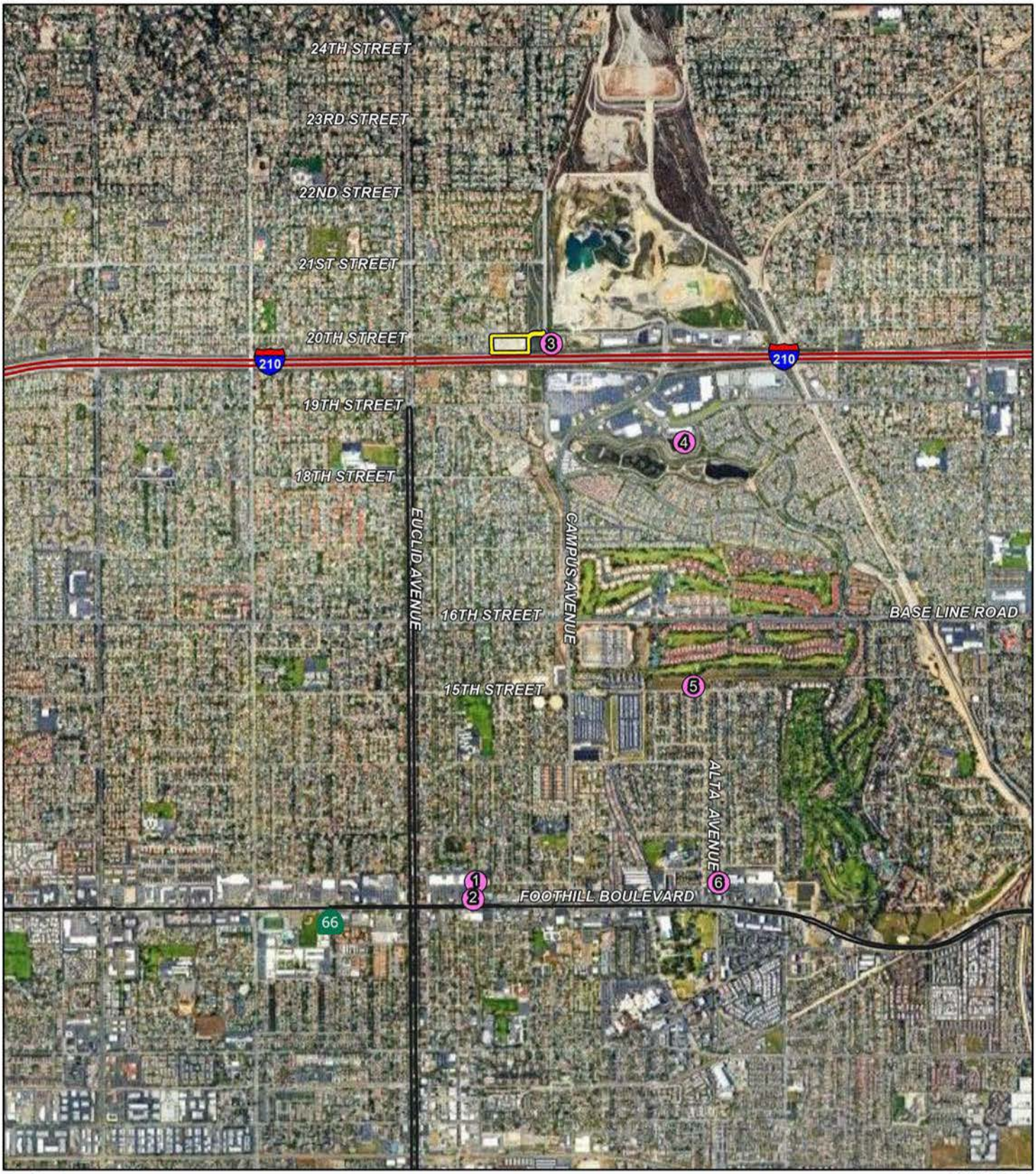
6.4 OPENING YEAR (2027) PLUS PROJECT LEVELS OF SERVICE

6.4.1 Study Intersections

An intersection LOS analysis was conducted for opening year plus project conditions using the methodologies previously discussed. Table 6.B summarizes the results of the analysis and shows that all intersections are forecast to operate at a satisfactory LOS under opening year plus project conditions. Detailed LOS worksheets are included in Appendix D.

6.5 LIST OF CHAPTER 6.0 FIGURES AND TABLES

- Figure 6-1: Approved and Pending Project Locations
- Figure 6-2: Approved and Pending Project Trip Assignment
- Figure 6-3: Opening Year (2027) without Project Peak Hour Traffic Volumes
- Figure 6-4: Opening Year (2027) plus Project Peak Hour Traffic Volumes
- Table 6.A: Approved and Pending Projects Trip Generation
- Table 6.B: Opening Year (2027) Intersection Levels of Service



LSA

LEGEND

Project Location

Cumulative Projects

0 1200 2400

FEET

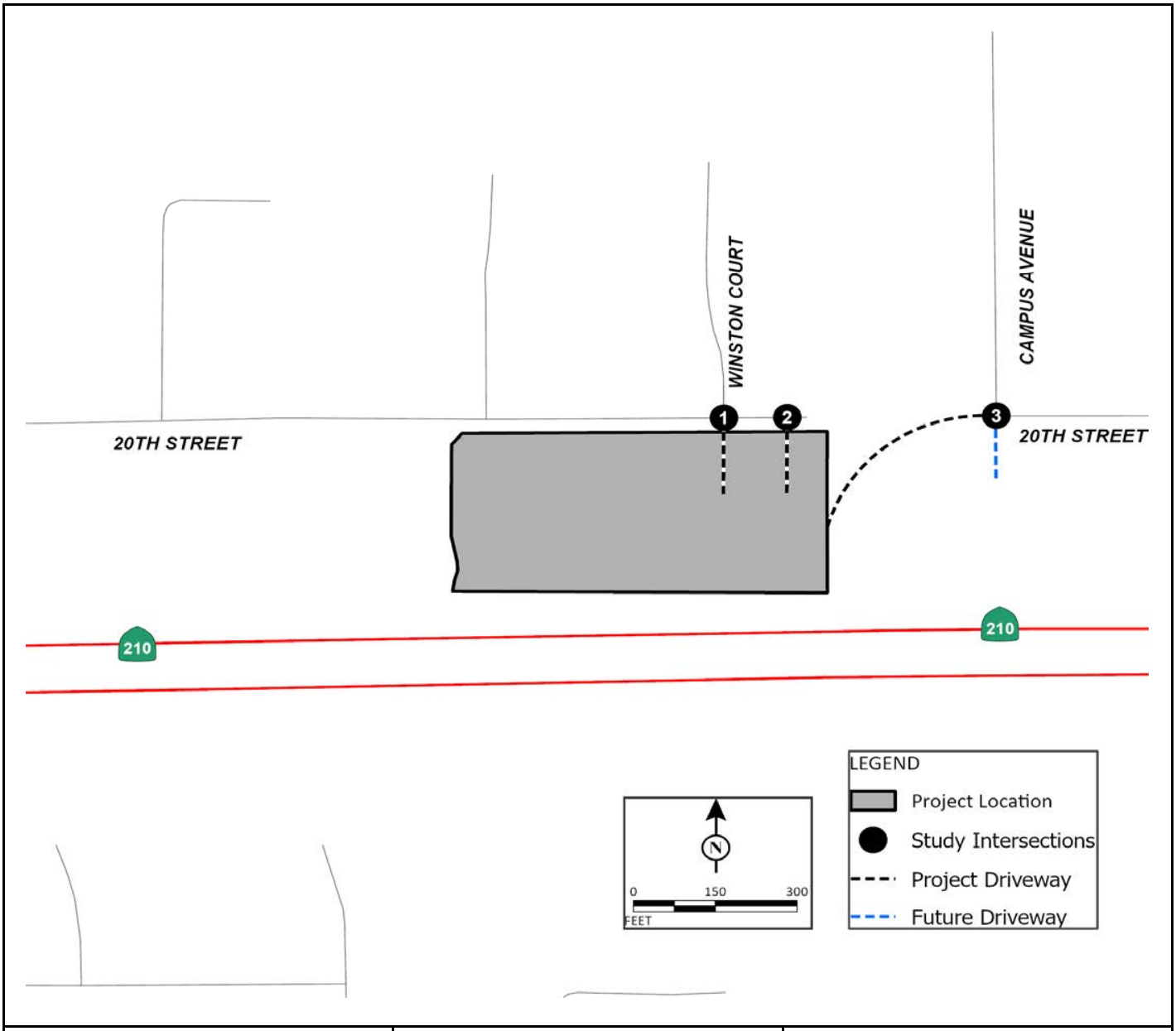
SOURCE: ESRI Streetmap, 2021; Google Earth, 2023

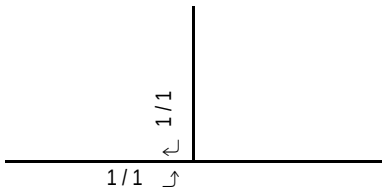
I:\2024\20241723\GIS\Pro\San Antonio Water Company Headquarters\San Antonio Water Company Headquarters.aprx (12/23/2024)

FIGURE 6-1

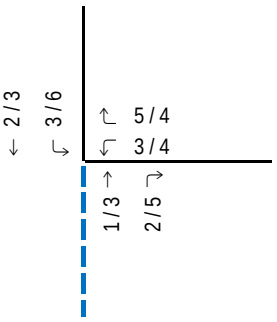
San Antonio Water Headquarters
Traffic Impact Analysis

Approved and Pending Project Locations





Future Intersection



1 **Winston Court - Project Driveway 1/20th Street**

2 **Project Driveway 2/20th Street**

3 **Campus Avenue/Project Driveway 3 - 20th Street**

FIGURE 6-2

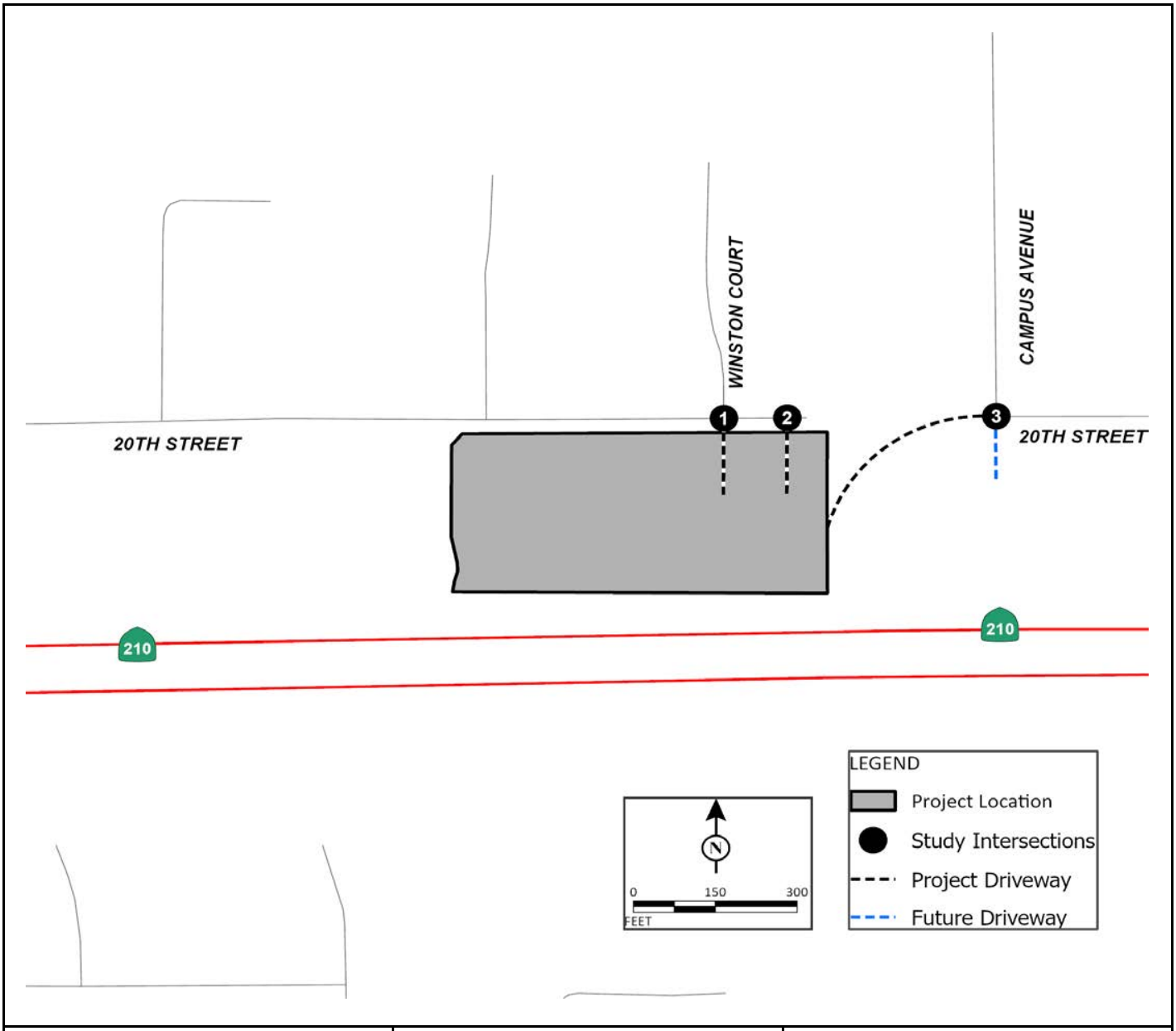
LSA

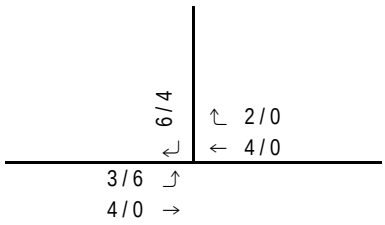
X / Y
AM / PM PCE Peak Hour Trips

Project Driveway
Future Driveway

San Antonio Water Headquarters
Traffic Impact Analysis

Approved and Pending Project Trip Assignment

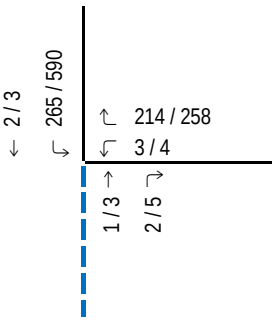




1 **Winston Court - Project Driveway 1/20th Street**

Future Intersection

2 **Project Driveway 2/20th Street**



3 **Campus Avenue/Project Driveway 3 - 20th Street**

FIGURE 6-3

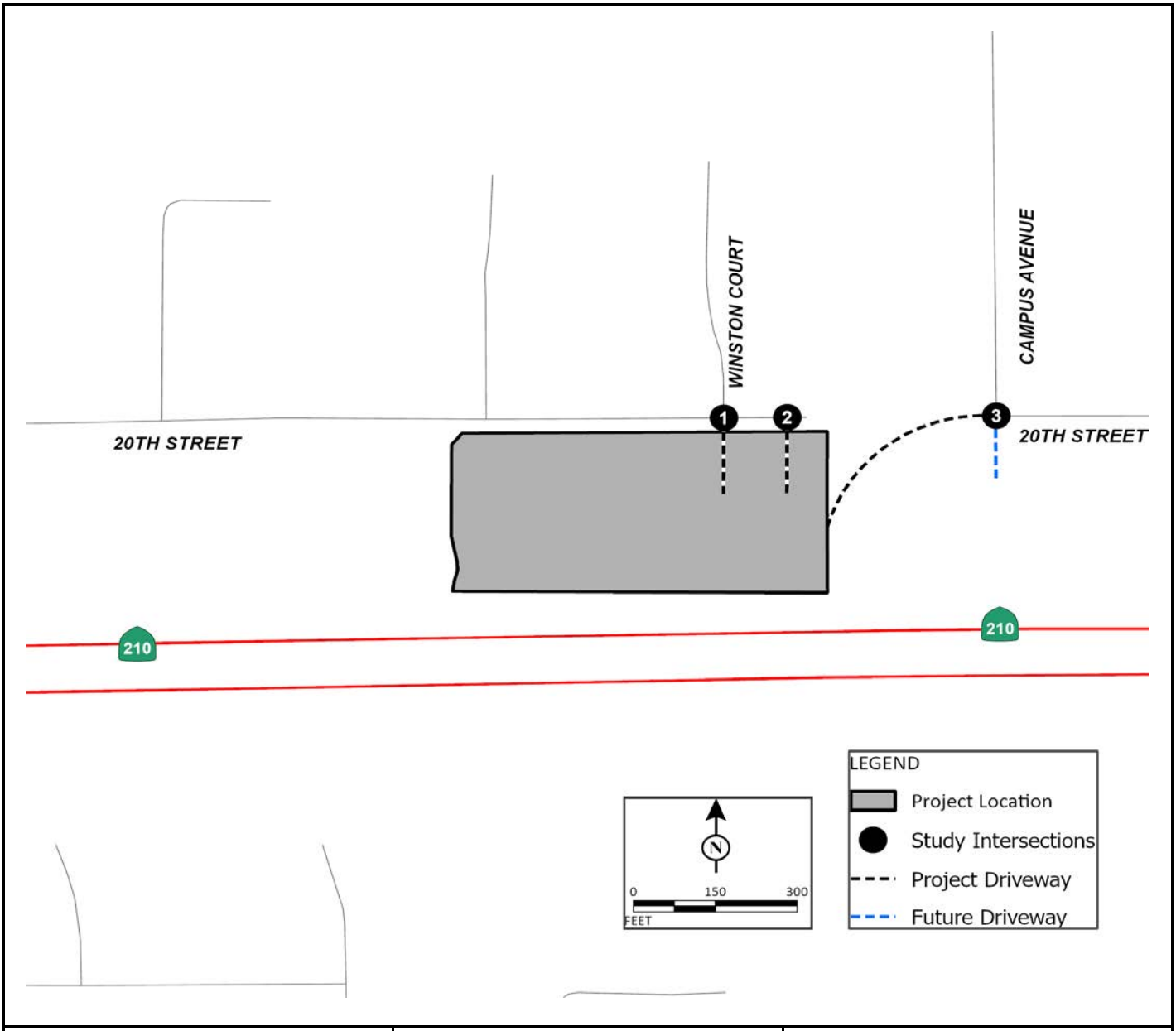
LSA

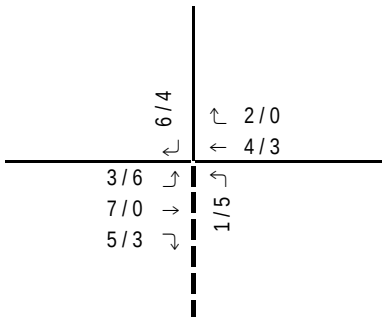
XXX / YYY
AM / PM PCE Peak Hour Trips

Project Driveway
Future Driveway

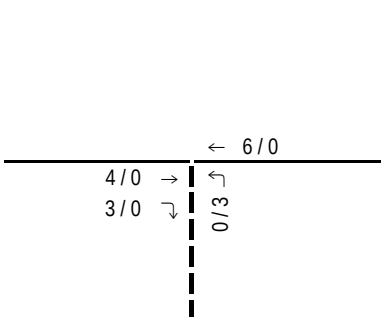
San Antonio Water Headquarters
Traffic Impact Analysis

Opening Year (2027) without Project Peak Hour Traffic Volumes

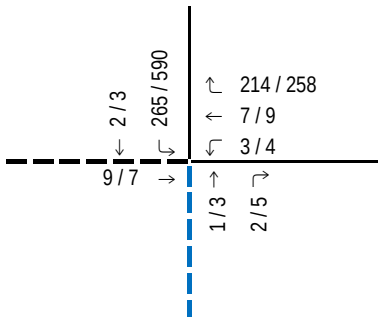




1 **Winston Court - Project Driveway 1/20th Street**



2 **Project Driveway 2/20th Street**



3 **Campus Avenue/Project Driveway 3 - 20th Street**

FIGURE 6-4

LSA

XXX / YYY
AM / PM PCE Peak Hour Trips

Project Driveway
Future Driveway

San Antonio Water Headquarters
Traffic Impact Analysis

Opening Year (2027) plus Project Peak Hour Traffic Volumes

LSA

Table 6.A: Approved and Pending Projects Trip Generation

Project No.	Land Use/Builder/Applicant/Project Name	Units	A.M. Peak Hour In	A.M. Peak Hour Out	A.M. Peak Hour Total	P.M. Peak Hour In	P.M. Peak Hour Out	P.M. Peak Hour Total	Daily
1.	**Amazon Fresh**								
	235 East Foothill Boulevard								
	Supermarket	35.000 TSF							
	Trips/Unit[1]		1.69	1.17	2.86	4.48	4.47	8.95	93.84
	Trip Generation		59	41	100	157	156	313	3,284
	Pass-by Trips[2]		0	0	0	(38)	(37)	(75)	(788)
	Net New Trips		59	41	100	119	119	238	2,496
2.	**Starbucks**								
	275 East Foothill Boulevard								
	Coffee/Donut Shop with Drive-Through Window	1.200 TSF							
	Trips/Unit[3]		43.80	42.08	85.88	19.50	19.49	38.99	533.57
	Trip Generation		53	50	103	23	23	46	640
	Pass-by Trips[4]		(27)	(25)	(52)	(13)	(12)	(25)	(336)
	Net New Trips		27	25	52	10	11	21	304
3.	**The Colonies Self Storage**								
	Southeast Corner of 20th Street and Campus Avenue								
	Mini Warehouse	164.570 TSF							
	Trip Generation[5]		10	6	16	13	15	28	249
4.	**Colony Condos**								
	1160 East 19th Street								
	Multifamily Housing (Low-Rise) Not Close to Rail Transit	60 DU							
	Trips/Unit[6]		0.10	0.30	0.40	0.32	0.19	0.51	6.74
	Trip Generation		6	18	24	19	11	30	404
5.	**Villa Serena**								
	15th Street, between Fernando Avenue and Monte Verde Avenue								
	Single-Family Detached Housing	65 DU							
	Trips/Unit[7]		0.18	0.52	0.70	0.59	0.35	0.94	9.43
	Trip Generation		12	34	46	38	23	61	613
6.	**Upland Oncology Center**								
	1113 North Alta Avenue								
	Medical-Dental Office Building - Stand-Alone	3.361 TSF							
	Trips/Unit[8]		2.45	0.65	3.10	1.18	2.75	3.93	36.00
	Trip Generation		8	2	10	4	9	13	121
		Gross Trip Generation	**138**	**145**	**283**	**241**	**222**	**463**	**5,062**
		Pass-By Trips	**(27)**	**(25)**	**(52)**	**(51)**	**(49)**	**(100)**	**(1,124)**
		Total Net Trip Generation	**112**	**120**	**232**	**190**	**173**	**363**	**3,938**

Notes:

DU = Dwelling Units; TSF = Thousand Square Feet.

[1] Rates from Institute of Transportation Engineers (ITE) Trip Generation Manual, (11th Edition) Land Use 850 - "Supermarket" , Setting/Location - 'General Urban/Suburban'.

[2] Pass-by rates from the ITE *Trip Generation Manual* (11th Edition) for Land Use 850 - 'Supermarket.' A pass-by rate of 24% was used for the p.m. peak hour. Since daily pass-by rates are not available for this land use in the ITE *Trip Generation Manual* , the p.m. pass-by rate was used as the daily pass-by rate.

[3] Rates from ITE *Trip Generation Manual* , (11th Edition), Land Use 937 - "Coffee/Donut Shop with Drive-Through Window" , Setting/Location - 'General Urban/Suburban'.

[4] Pass-by rates from the ITE *Trip Generation Manual* (11th Edition) for Land Use 937 - 'Coffee/Donut Shop with Drive-Through Window.' A pass-by rate of 50% was used for the a.m. peak hour and a pass-by rate of 55% was used for the p.m. peak hour. Since daily pass-by rates are not available for this land use in the ITE *Trip Generation Manual* , the average of a.m and p.m. pass-by rate was used as the daily pass-by rate.

[5] Trip generation taken from "Proposed Self-Storage Facility" transportation impact assesment by Overland Traffic Consultants (May 2021).

[6] Rates from ITE *Trip Generation Manual* , (11th Edition), Land Use 220 - "Multifamily Housing (Low-Rise) Not Close to Rail Transit" , Setting/Location - 'General Urban/Suburban'.

[7] Rates from ITE *Trip Generation Manual* , (11th Edition), Land Use 210 - "Single-Family Detached Housing" , Setting/Location - 'General Urban/Suburban'.

[8] Rates from ITE *Trip Generation Manual* , (11th Edition), Land Use 720 - "Medical-Dental Office Building - Stand-Alone" , Setting/Location - 'General Urban/Suburban'.

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Table 6.B: Opening Year (2027) Intersection Levels of Service

Intersection	Jurisdiction	LOS Standard	Without Project					Plus Project				
			Control	A.M. Peak Hour Delay (sec.)	A.M. Peak Hour LOS	P.M. Peak Hour Delay (sec.)	P.M. Peak Hour LOS	Control	A.M. Peak Hour Delay (sec.)	A.M. Peak Hour LOS	P.M. Peak Hour Delay (sec.)	P.M. Peak Hour LOS
1 . Winston Court - Project Driveway 1/20th Street	Upland	D	OWSC	8.4	A	8.3	A	TWSC	8.7	A	8.7	A
2 . Project Driveway 2/20th Street	Upland	D	--	*Future Intersection*		*Future Intersection*		OWSC	0.0	A	8.5	A
3 . Campus Avenue/Project Driveway 3 - 20th Street[1]	Upland	D	OWSC	8.3	A	8.3	A	TWSC	4.9	A	7.2	A

Notes:

OWSC = One-Way Stop Control; TWSC = Two-Way Stop Control; LOS = Level of Service

Delay = Average control delay in seconds (For OWSC/TWSC intersections, reported delay is for worst-case movement).

* Exceeds LOS Standard

[1] For the purpose of this analysis, intersection was analyzed as a OWSC under ' without project" and TWSC under 'plus project' scenarios. Delay reported from SimTraffic under 'plus project' scenarios.

7.0 HORIZON YEAR ANALYSIS

7.1 HORIZON YEAR (2050) WITHOUT PROJECT TRAFFIC VOLUMES

Traffic volumes for horizon year without project conditions were developed by using forecast traffic volumes obtained from the San Bernardino Transportation Analysis Model (SBTAM). The methodology to develop horizon year without project volumes at study area intersections is consistent with the SBCTA procedures for post-processing of modeled traffic volumes.

Figure 7-1 illustrates horizon year without project peak-hour traffic volumes at study intersections.

7.2 HORIZON YEAR (2050) PLUS PROJECT TRAFFIC VOLUMES

Horizon year plus project traffic volumes were developed by adding proposed project traffic to the horizon year without project traffic volumes.

Figure 7-2 illustrates horizon year plus project peak-hour traffic volumes at study intersections.

Detailed volume development worksheets are included in Appendix C.

7.3 HORIZON YEAR (2050) WITHOUT PROJECT LEVELS OF SERVICE

7.3.1 Study Intersections

An intersection LOS analysis was conducted for horizon year without project conditions using the methodologies previously discussed. Table 7.A summarizes the results of the analysis and shows that all intersections are forecast to operate at a satisfactory LOS under horizon year without project conditions.

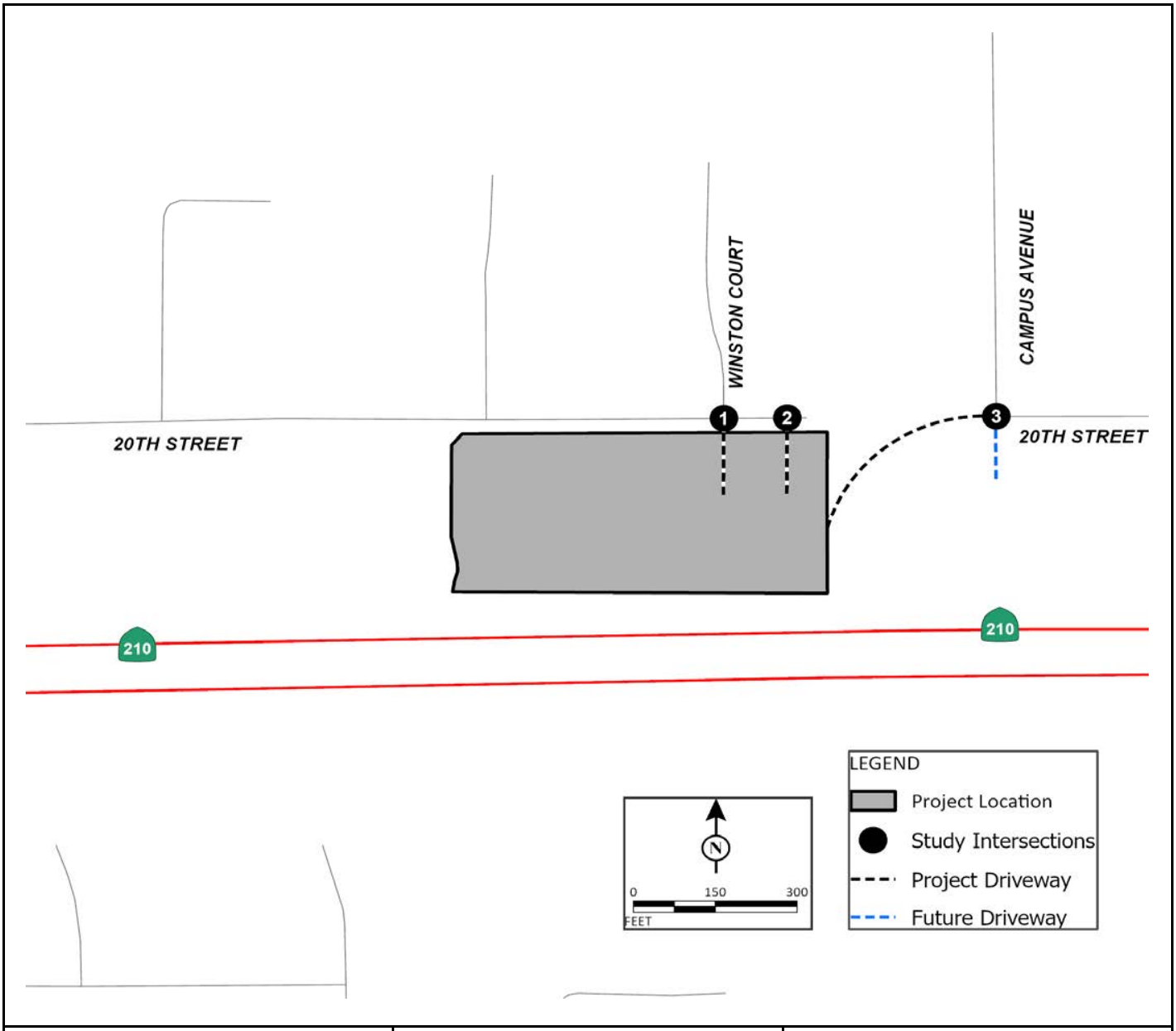
7.4 HORIZON YEAR (2050) PLUS PROJECT LEVELS OF SERVICE

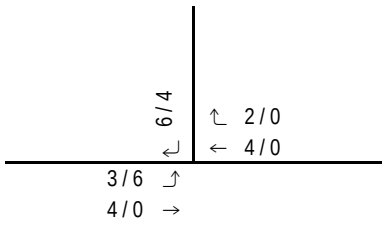
7.4.1 Study Intersections

An intersection LOS analysis was conducted for horizon year plus project conditions using the methodologies previously discussed. Previously referenced Table 7.A summarizes the results of the analysis and shows that all intersections are forecast to operate at a satisfactory LOS under horizon year plus project conditions. Detailed LOS worksheets are included in Appendix D.

7.5 LIST OF CHAPTER 7.0 FIGURES AND TABLES

- Figure 7-1: Horizon Year (2050) without Project Peak Hour Traffic Volumes
- Figure 7-2: Horizon Year (2050) plus Project Peak Hour Traffic Volumes
- Table 7.A: Horizon Year (2050) Intersection Levels of Service

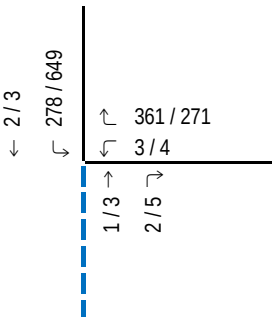




1 **Winston Court - Project Driveway 1/20th Street**

Future Intersection

2 **Project Driveway 2/20th Street**



3 **Campus Avenue/Project Driveway 3 - 20th Street**

FIGURE 7-1

LSA

XXX / YYY
AM / PM PCE Peak Hour Trips

Project Driveway
Future Driveway

San Antonio Water Headquarters
Traffic Impact Analysis

Horizon Year (2050) without Project Peak Hour Traffic Volumes

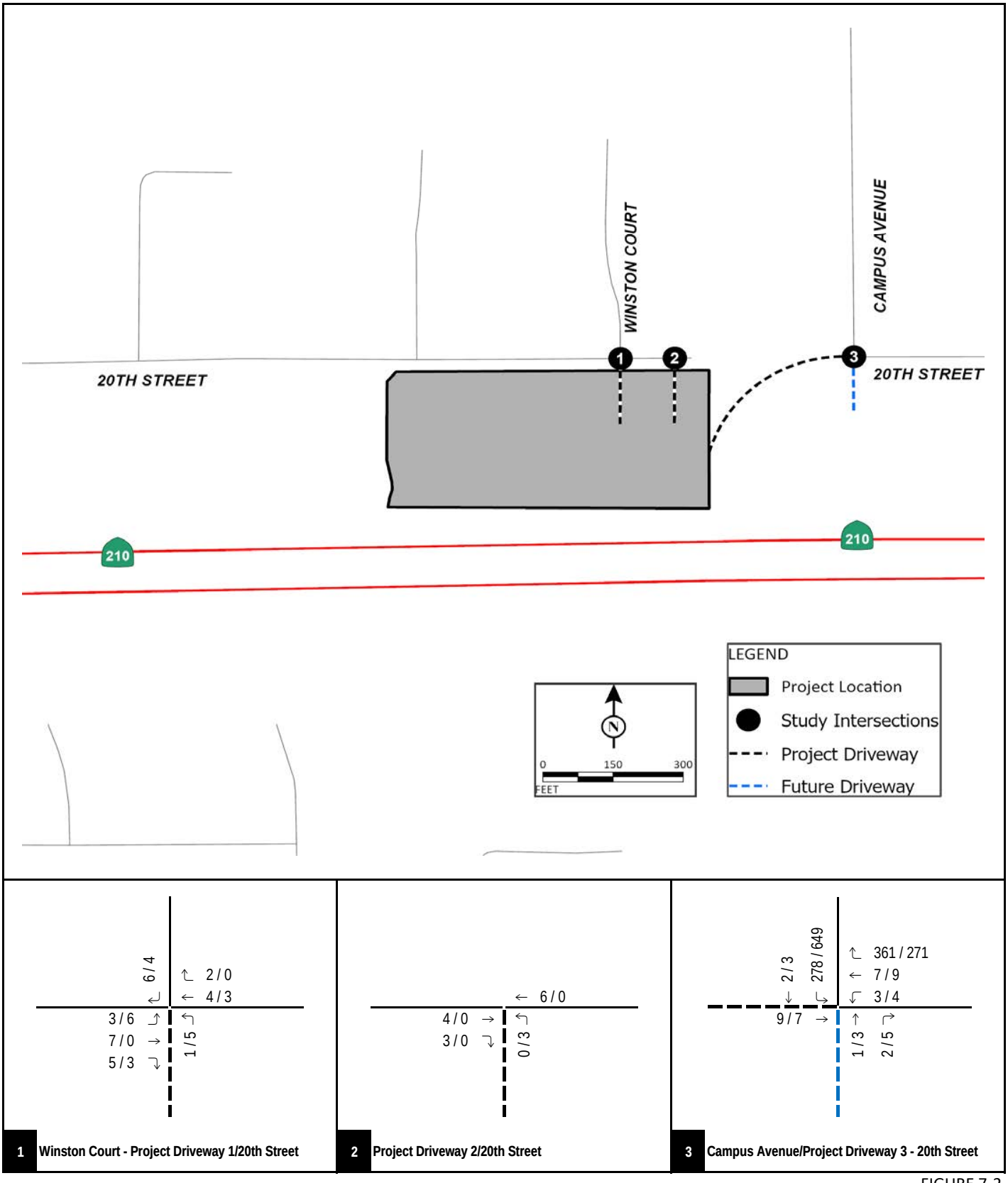


FIGURE 7-2

LSA

XXX / YYY
AM / PM PCE Peak Hour Trips

Project Driveway
Future Driveway

San Antonio Water Headquarters
Traffic Impact Analysis

Horizon Year (2050) plus Project Peak Hour Traffic Volumes

LSA

Table 7.A: Horizon Year (2050) Intersection Levels of Service

Intersection	Jurisdiction	LOS Standard	Without Project					Plus Project				
			Control	A.M. Peak Hour Delay (sec.)	A.M. Peak Hour LOS	P.M. Peak Hour Delay (sec.)	P.M. Peak Hour LOS	Control	A.M. Peak Hour Delay (sec.)	A.M. Peak Hour LOS	P.M. Peak Hour Delay (sec.)	P.M. Peak Hour LOS
1 . Winston Court - Project Driveway 1/20th Street	Upland	D	OWSC	8.3	A	8.3	A	TWSC	8.6	A	8.6	A
2 . Project Driveway 2/20th Street	Upland	D	--	*Future Intersection*		*Future Intersection*		OWSC	0.0	A	8.5	A
3 . Campus Avenue/Project Driveway 3 - 20th Street[1]	Upland	D	OWSC	8.3	A	8.3	A	TWSC	5.1	A	8.5	A

Notes:

OWSC = One-Way Stop Control; TWSC = Two-Way Stop Control; LOS = Level of Service

Delay = Average control delay in seconds (For OWSC/TWSC intersections, reported delay is for worst-case movement).

* Exceeds LOS Standard

[1] For the purpose of this analysis, intersection was analyzed as a OWSC under ' without project" and TWSC under 'plus project' scenarios. Delay reported from SimTraffic under 'plus project' scenarios.

8.0 SITE ACCESS ANALYSIS

8.1 SIGHT DISTANCE ANALYSIS

Per request by City staff, a sight distance analysis was conducted at the project driveways along 20th Street and Campus Avenue to evaluate safe access in and out of the project. Sight distance is the length of the visible roadway a driver can see approaching vehicles before their line of sight is blocked by any object. For purposes of this analysis, both the stopping sight distance and corner sight distance have been evaluated. That is because those are the two sight distance issues that would affect safe maneuver of ingress/egress traffic from the project driveway.

According to the Caltrans Highway Design Manual (HDM) (dated July 2020), the stopping sight distance is the minimum sight distance along a roadway required to allow a driver to decrease their speed from the design speed to a complete stop. The corner sight distance is the minimum sight distance in which a driver at a stop-controlled approach can see oncoming traffic on the major street to safely maneuver onto the roadway.

The stopping sight distance was evaluated on the street abutting the project (i.e., 20th Street). The posted speed limit on 20th Street is 35 mph. For purposes of this analysis, the posted speed limit has been considered as the design speed. As stated in Table 201.1 of the HDM, the minimum stopping distance is 250 feet for a design speed of 35 mph. Therefore, the minimum stopping sight distances for Project Driveway 1 and Project Driveway 2 have been considered as 250 feet. In addition, the posted speed limit on Campus Avenue is 40 mph. As stated in Table 201.1 of the HDM, the minimum stopping distance is 250 feet for a design speed of 35 mph. Therefore, the minimum stopping sight distance for the Project Driveway 3 was considered as 300 feet.

As for corner sight distance, Section 405.1 of the HDM states that corner sight distance requirements are not applicable for urban driveways unless signalized. However, as a conservative approach, corner sight distances were also evaluated for the project driveways. The minimum corner sight distance was based on design speed, time gap, and type of vehicles from the minor roads (project driveways) to enter the major roads (20th Street). Based on the requirements established in the HDM, it was determined that a minimum corner sight distance of 390 feet for left-turn maneuvers and 335 feet for right-turn maneuvers coming out of Project Driveway 1 and Project Driveway 2 would be required.

Furthermore, for Project Driveway 3, as previously mentioned minimum corner sight distance was based on design speed, time gap, and type of vehicles from the minor roads (project driveways) to enter the major roads (Campus Avenue). Given the location of this project driveway, it should be noted that vehicles can possibly be traveling less than allowed speed limit. However, as a conservative measure, corner sight distances were calculated using metrics for combination trucks and speed limit of 40 mph. Thus, based on the requirements established in the HDM, it was determined that a minimum corner sight distance of 680 feet for left-turn maneuvers and 620 feet for right-turn maneuvers coming out of Project Driveway 3 would be required.

Since the corner sight distance required at the project driveways would be greater than the stopping sight distance, sight triangle figures were created using corner sight distance as a conservative approach. Project Driveway 1 will provide adequate sight distance for left-turn maneuvers as shown by the sight distance triangles illustrated on Figure 8-1. Project Driveway 2 will provide adequate sight distance for left-turn maneuvers, as shown by the sight distance triangle illustrated on Figure 8-2. Project Driveway 3 will provide adequate sight distance for left-turn maneuvers as shown by the sight distance triangles illustrated on Figure 8-3.

8.2 BICYCLE, PEDESTRIAN, AND TRANSIT ACCESSIBILITY

8.2.1 Bicycle Accessibility

As part of the City's Bikeway Network, Class III bike routes exist on both directions of Campus Avenue north of SR-210 within the study area. Since there are no existing bike facilities along 20th Street, bicyclists currently will not be able to access the project site.

8.2.2 Pedestrian Accessibility

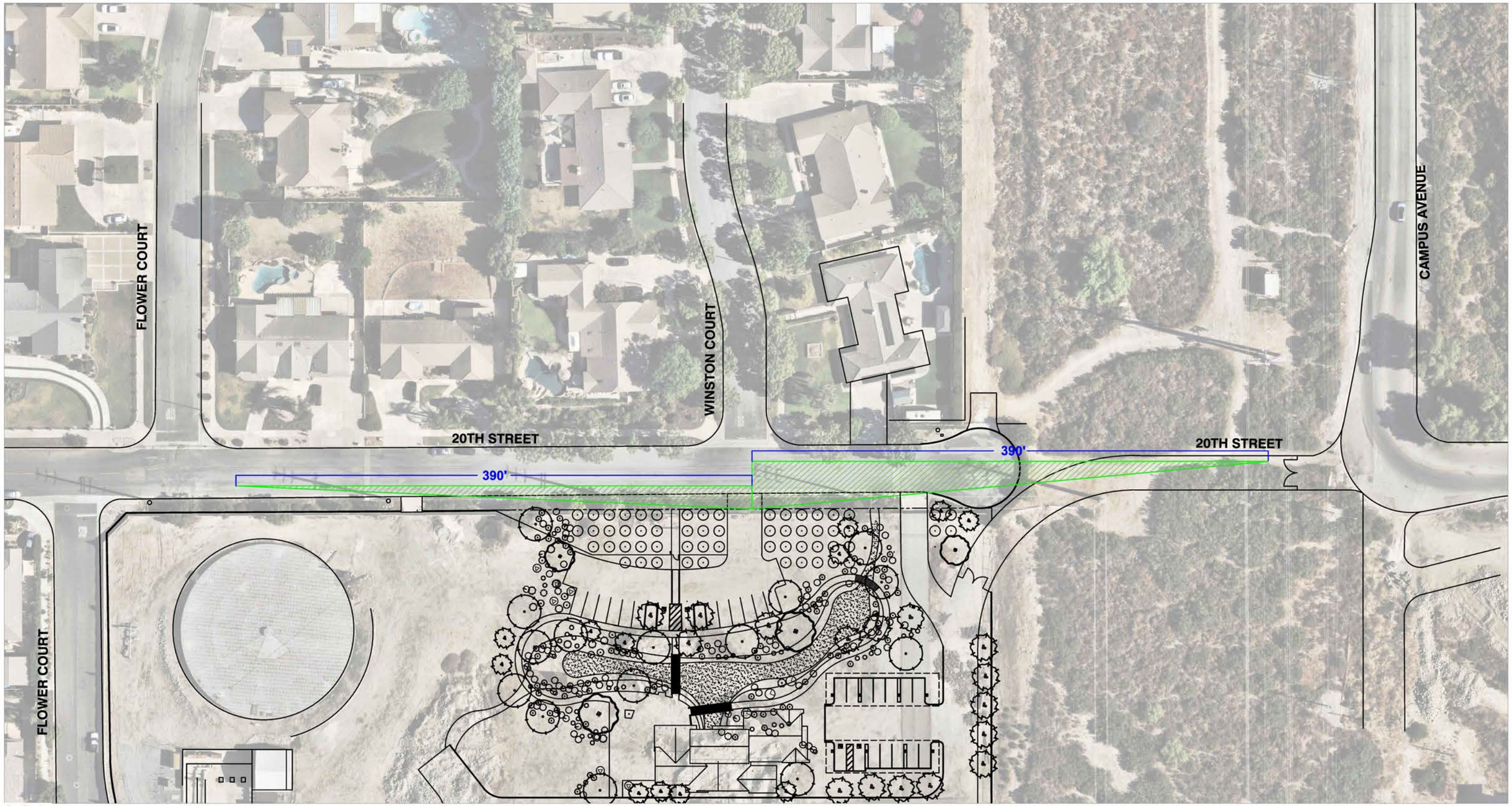
According to the City's General Plan, the study area on Campus Avenue and 20th Street east of the SCE easement has been identified as the areas that needs sidewalks, as shown on Figure 4-7.

8.2.3 Transit Accessibility

Omnitrans provides both local and regional services throughout the region, with 30 fixed routes and 5 OmniGo routes using 178 vehicles. There are no Omnitrans bus routes that operate within the study area.

8.3 LIST OF CHAPTER 8.0 FIGURES

- Figure 8-1: Corner Sight Distance at Project Driveway 1
- Figure 8-2: Corner Sight Distance at Project Driveway 2
- Figure 8-3: Corner Sight Distance at Project Driveway 3



LSA

FIGURE 8-1

0 40' 80'
FEET

SOURCE: CEDG, Inc., August 2023

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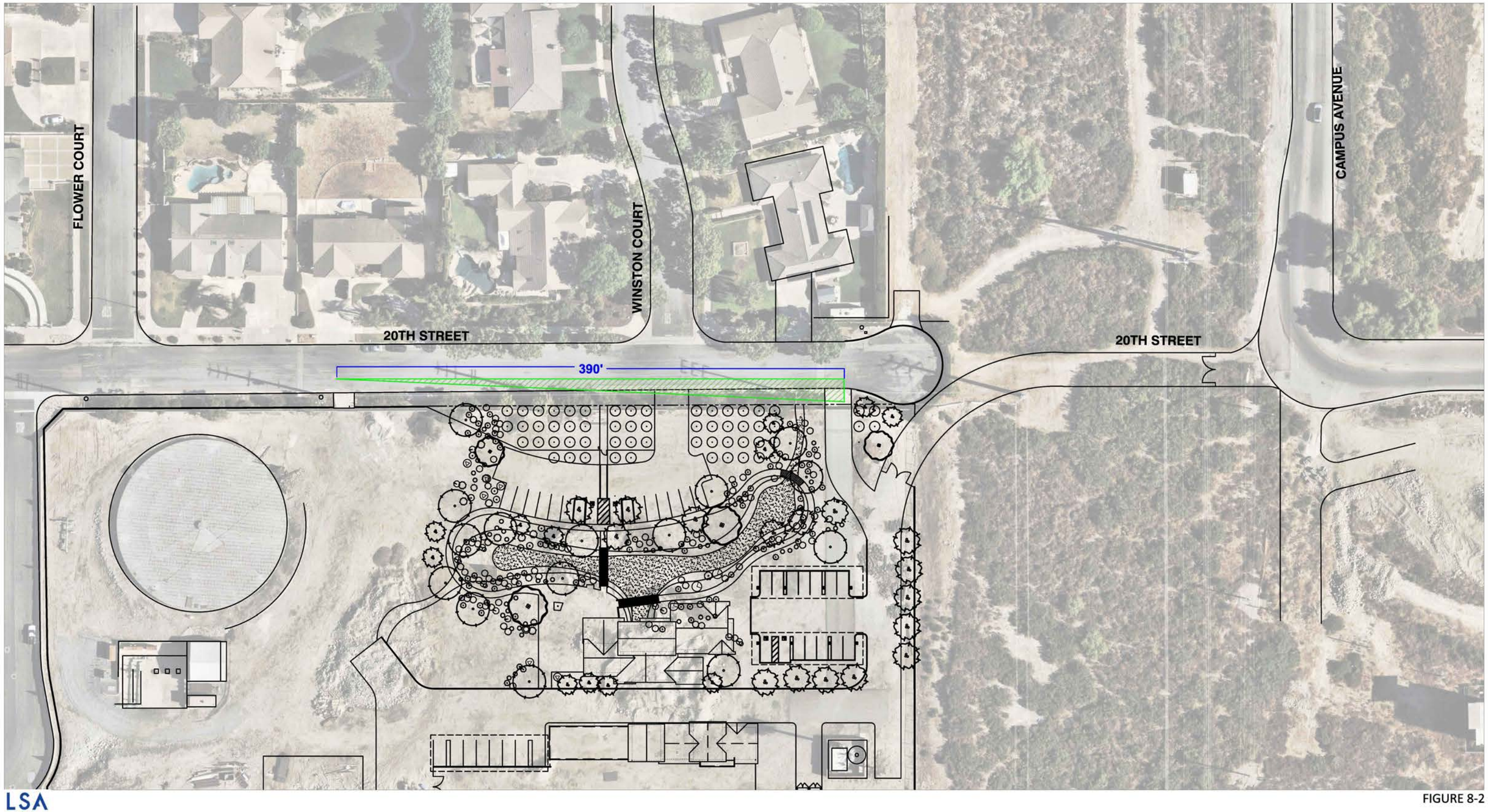
San Antonio Water Headquarters
Traffic Impact Analysis

Corner Sight Distance at Winston Court - Project Driveway 1/20th Street



LSA

FIGURE 8-2

0 40' 80'
FEET

SOURCE: CEDG, Inc., August 2023
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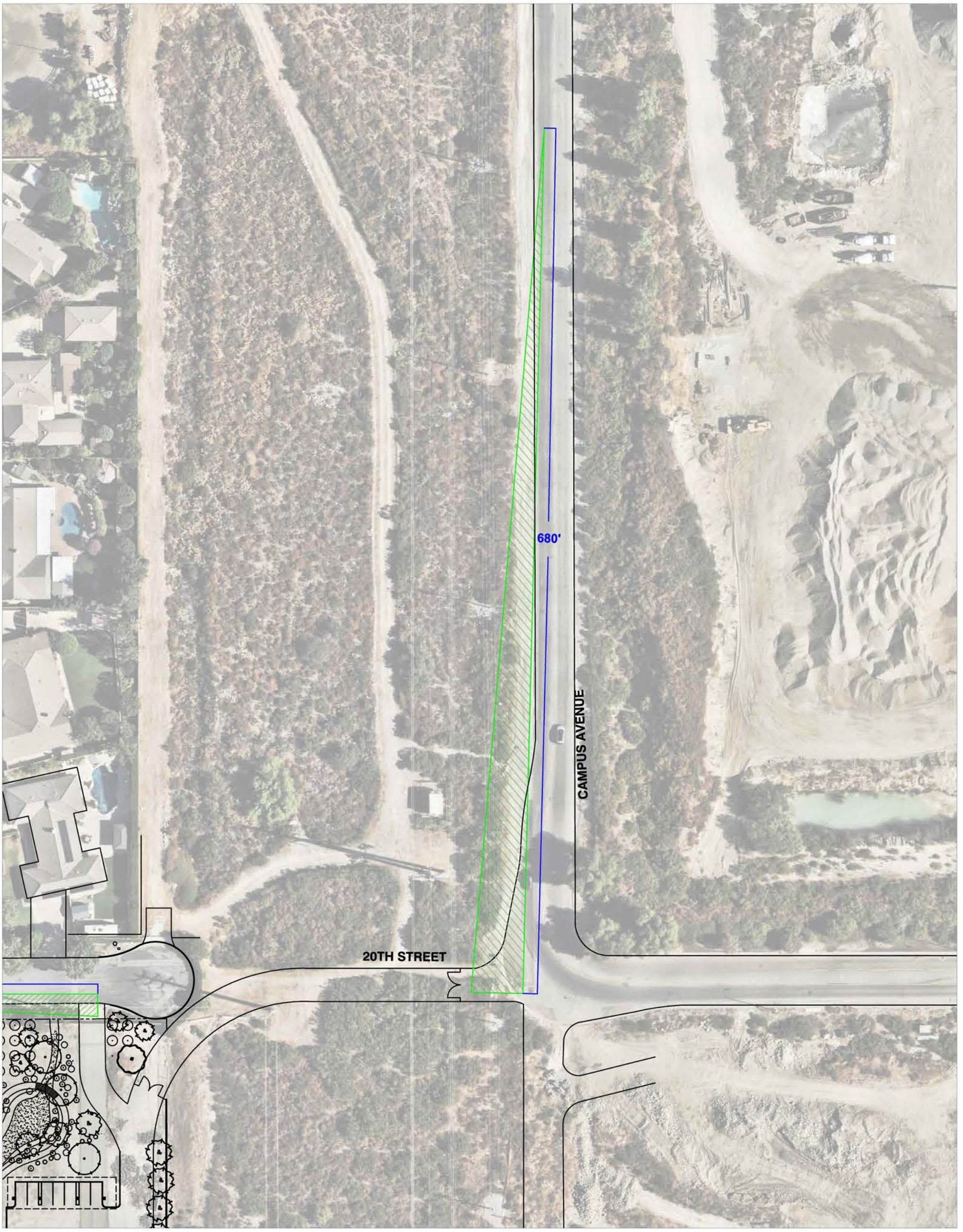
San Antonio Water Headquarters
Traffic Impact Analysis

Corner Sight Distance at Project Driveway 2/20th Street



LSA

FIGURE 8-3

N

0 40' 80'
FEET

SOURCE: CEDG, Inc., August 2023
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San Antonio Water Headquarters
Traffic Impact Analysis

Corner Sight Distance at Campus Avenue/Project Driveway 3 - 20th Street

9.0 CEQA ASSESSMENT—VEHICLE MILES TRAVELED ANALYSIS AND ACTIVE TRANSPORTATION AND PUBLIC TRANSIT ANALYSIS

9.1 VEHICLE MILES TRAVELED ANALYSIS

On December 28, 2018, the California Office of Administrative Law cleared the revised California Environmental Quality Act (CEQA) Guidelines for use. Among the changes to the CEQA Guidelines was the removal of vehicle delay and LOS from consideration under CEQA. With the adopted CEQA Guidelines, transportation impacts are to be evaluated based on a project's effect on VMT.

LSA utilized the TIA Guidelines for the VMT analysis of the proposed project. The City's TIA Guidelines include screening criteria, VMT analysis methodology, VMT impact thresholds, and VMT mitigation measures.

The TIA Guidelines provide multiple screening criteria for land use projects. The VMT screening criteria in the "Analysis Methodology" section of the TIA Guidelines were reviewed to determine whether the proposed project could be screened out from a VMT analysis. Following is a brief description of the proposed project in relation to the VMT screening criteria:

- **Project Located in TPA:** The proposed project is not located within a TPA; therefore, this screening criterion does not apply.

- **Residential or Office Project Located in Low-VMT Area:** The project is not a residential or office project; therefore, this criterion does not apply.

- **Project Type (Land Use) Screening:** According to the TIA Guidelines, "Projects generating less than 250 daily vehicle trips" are presumed to have a less than significant impact. As shown in Table 5.A, the project generates 91 daily vehicle trips. Therefore, the project is not estimated to have any significant VMT impact and may be screened out from a detailed VMT analysis.

9.2 ACTIVE TRANSPORTATION AND PUBLIC TRANSIT ANALYSIS

According to the City's TIA Guidelines, a significant impact occurs when a project conflicts with adopted plans, policies, or programs regarding active transportation or public transit facilities, or otherwise decreases the performance or safety of such facilities.

Based on the City's Bikeway Network, Class III bike routes exist on both directions of Campus Avenue north of SR-210 within the study area. The project would not modify the existing bike routes along Campus Avenue. As such, the project would not decrease the performance or safety of any existing or proposed bicycle facility.

According to the City's General Plan, the study area on Campus Avenue has been identified as the area that needs sidewalks. The project would not modify any existing sidewalks. As such, the project would not decrease the performance or safety of any existing or proposed pedestrian facility.

Omnitrans provides both local and regional services throughout the region, with 30 fixed routes and 5 OmniGo routes using 178 vehicles. There are no Omnitrans bus routes that operate within the study area. The project would not modify or affect any public transit access within the study area.

The project does not conflict with any existing or proposed bicycle, pedestrian, or public transit facilities. Therefore, it can be considered to conform to all adopted policies, plans, or programs concerning these facilities and would not have a significant impact.

10.0 CIRCULATION IMPROVEMENTS AND FUNDING SOURCES

10.1 RECOMMENDED IMPROVEMENTS

Based on the results of the LOS analysis, all study intersections are forecast to operate at a satisfactory LOS under all scenarios. Therefore, no circulation improvements are recommended at this time.

APPENDIX A

SCOPING AGREEMENT

CARLSBAD
CLOVIS
IRVINE
LOS ANGELES
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROSEVILLE
SAN LUIS OBISPO

August 28, 2024

Mr. Alan French
Principal Engineer
City of Upland
460 N. Euclid Avenue
Upland, California 91786

Subject: Scope of Work for the San Antonio Water Headquarters Traffic Impact Analysis (LSA Project No.20241723)

Dear Alan:

LSA is preparing a Traffic Impact Analysis (TIA) for the San Antonio Water Headquarters Project (project) located at 400 East 20th Street in the City of Upland (City). The project site is located in northwest Upland in an area primarily consisting of residential, commercial, and industrial uses. The Project site is bound by East 20th Street to the north, Southern California Edison (SCE) easement (open space) to the east, State Route 210 (SR-210) to the south, and Flower Court to the west. There are currently existing structures on the project site: a one-million-gallon water storage tank located at the northwestern corner of the parcel, a pump station located at the southwestern corner of the parcel, and a signal building and tower located at the southeastern corner of the parcel. Figure 1 (all figures, tables, and appendices attached) illustrates the regional and project location.

The proposed project proposes to develop a new 3,698 square-foot San Antonio Water Co. (SAWCO) headquarters and associated improvements including a 4,066 square-foot maintenance building, maintenance yard, driveway, parking, solar cover, landscaping, and utility improvements. The existing water storage tank, pump station, and signal buildings and tower would remain in place. Based on the project description and operational information provided, it is anticipated that approximately 10 people would be employed on the Project site. Access to the project site will be provided via two driveways on 20th Street and one driveway on Campus Avenue. The westerly driveway on E. 20th Street along the northern property boundary provides access for SAWCO patrons and customers. The middle driveway located on the northeastern corner of the project site provides access to the SAWCO employee parking area and maintenance facilities. The easterly driveway located on the northeastern corner of the project site would connect to the intersection of Campus Avenue and E. 20th Street. This easterly driveway would require acquisition of right-of-way from the existing SCE easement. For purposes of this analysis, all driveways have been considered as full-access driveways. Figure 2 illustrates the conceptual site plan for the project.

LSA anticipates that the following scope of work will be required to prepare the TIA for the proposed project.

1500 Iowa Avenue, Suite 200, Riverside, California 92507 951.781.9310 www.lsa.net

SCOPE OF WORK

The scope of work has been prepared as per the City of Upland *Traffic Impact Analysis Guidelines* (TIA Guidelines), dated July 2020. As per the City's TIA Guidelines, the TIA should include two components – 1) a Level of Service (LOS) Analysis for General Plan consistency purposes and 2) a Vehicle Miles Traveled (VMT) Analysis and an Active Transportation and Public Transit Analysis for California Environmental Quality Act (CEQA) requirements.

LEVEL OF SERVICE ANALYSIS

Study Area

As per the City's TIA guidelines, at a minimum, the study area must include intersections with 51 or more two-way peak-hour project trips. However, based on comments provided by City staff, a LOS analysis will need to be prepared to determine the potential operational issues concerning the project driveways, including the driveway connecting to the intersection of Campus Avenue/20th Street. As such, the following intersections were included in the TIA:

Study Intersections:

1. Winston Court – Project Driveway 1/20th Street;
2. Project Driveway 2/20th Street; and
3. Campus Avenue/Project Driveway 3 - 20th Street.

Figure 3 illustrates the study area intersections.

Traffic operations at all study intersections will be analyzed during the weekday a.m. and p.m. peak hours. The a.m. peak hour is defined as the one hour period of the highest traffic volume occurring between 7:00 and 9:00 a.m. while the p.m. peak hour is defined as the one hour period of the highest traffic volume occurring between 4:00 and 6:00 p.m. Intersection LOS will be calculated using the *Highway Capacity Manual* 7th Edition (HCM 7) analysis methodologies and by using the Synchro 12 software.

Project Trip Generation, Trip Distribution, and Trip Assignment

The trip generation for the proposed project was developed as follows:

Employee Trip Generation

Based on the project description and operational information, the project is anticipated to have 10 full-time employees. For purposes of this analysis, all 10 employees are anticipated to arrive at the facility in the a.m. peak hour and leave the facility in the p.m. peak hour. Therefore, the project is estimated to generate 20 daily employee trips with 10 inbound a.m. peak hour trips and 10 outbound p.m. peak hour trips.

Additionally, based on the project description and operational information, the project is anticipated to have 6 trucks for the operations. Based on information from the applicant, the truck trips are described as followed:

- Truck #1 (2-axle light duty truck): Truck is considered as a standby vehicle and will average around 80-90 miles per day.
- Truck #2 (2-axle light duty truck): Truck is considered as a retired standby vehicle/ support vehicle for construction jobs and will average around 20-25 miles per day.
- Truck #3 (2-axle light duty truck): Truck is considered as a general maintenance/support vehicle for construction jobs and will average around 20-25 miles per day. It is likely only to be driven for around 75% of work week.
- Truck #4 (2-axle medium duty truck): Truck is considered as a dump truck. This vehicle will average 20-25 miles per day and is usually only driven about 4-5 days a month.
- Truck #5 (2-axle medium duty truck): Truck is considered as a service truck and planned to be used for larger construction jobs and heavy maintenance. This vehicle will average around 20-25 miles per day and likely only to be driven for around 75% of the work week.
- Truck #6 (2-axle light duty truck): This vehicle has an auxiliary fuel tank that will be used for refueling the project's tractors. Occasionally used for short runs for parts and supplies. It will average around 20-25 miles per day and likely only to be driven for around 5-6 days a month.

For purposes of this analysis, all trucks were considered to be 2-axle trucks and operating within the same day as a conservative estimate. Therefore, it could be estimated that the project will be generating 12 daily employee truck trips (inbound and outbound combined). Based on the operational hours, these trips could be estimated as peak hour trips, with 6 outbound truck trips occurring during a.m. peak hour, and 6 inbound truck trips occurring during the p.m. peak hour. All truck trips were converted to passenger car equivalent (PCE) trips using a 1.5 PCE factor for 2-axle trucks based on TIA Guidelines.

Customer Trip Generation

- Headquarter Building – The trip generation for this component was developed using rates from the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (11th Edition) for Land Use 712 – "Small Office Building."

The project trip generation is summarized in Table A. As shown in Table A, the project is anticipated to generate 91 total net PCE daily trips, with 25 net PCE trips occurring during the a.m. peak hour and 27 net PCE trips occurring during the p.m. peak hour.

The distribution of project trips is based on the regional roadway network and the location of residential, employment and commercial center in relation to the proposed project. Figure 4

illustrates the project trip distribution for the employees. Figure 5 illustrates the project trip distribution for the maintenance trucks. Figure 6 illustrates the customer trip distribution. The project trip assignment at the study intersections is the product of the project trip generation and the corresponding trip distribution percentages. Figure 7 illustrates the trip assignment for employees. Figure 8 illustrates the trip assignment for maintenance trucks. Figure 9 illustrates the trip assignment for customers. Figure 10 illustrates the total project trip assignment.

Analysis Scenarios

The TIA will be prepared based on consultation with City staff to meet the requirements of the City. The TIA will examine traffic operations at the study area intersections under the following scenarios:

- Existing Conditions;
- Project Opening Year without Project Conditions;
- Project Opening Year plus Project Conditions;
- Horizon Year without Project Conditions; and
- Horizon Year plus Project Conditions.

The Project Opening Year is estimated to be Year 2027. The Horizon Year is considered to be Year 2045.

Volume Development and Analysis Methodology

Traffic volumes for existing conditions are typically developed using existing count data collected at study area intersections.

Traffic volumes for project opening year without project conditions will be developed by applying an ambient growth rate of 2 percent per annum to existing traffic volumes and adding traffic volumes from approved and pending projects in the vicinity of the proposed project. LSA contacted City staff and the adjacent jurisdiction of San Bernardino County for information regarding cumulative projects. Cumulative projects to be included in this study are summarized in Table B. Locations of cumulative projects are illustrated in Figure 11.

Traffic volumes for horizon year without project conditions will be developed by using forecast traffic volumes obtained from the San Bernardino Transportation Analysis Model (SBTAM). The methodology to develop horizon year without project traffic volumes at study area intersections will be consistent with the San Bernardino County Transportation Authority (SBCTA) procedures for post-processing of modeled traffic volumes.

Project opening year and horizon year plus project traffic volumes will be developed by adding project traffic to the traffic volumes for the corresponding without project scenarios.

Analysis of Traffic Operations and Recommended Circulation Improvements

Levels of service without the project will be compared with levels of service plus the project for all analysis scenarios to determine operational deficiencies based on the LOS standards and operational

deficiency criteria as applicable for the City. Furthermore, necessary improvements will be recommended to offset any operational deficiencies. Improvements may include addition of intersection turn lanes, segment lane additions, signalization, etc. The LOS with the proposed improvements will be calculated and summarized, along with a comparison of the LOS without improvements.

Signal Warrant Analysis (if Required)

A signal warrant analysis would be conducted at unsignalized intersections if a signal is recommended as an improvement. Peak hour approach volumes for study intersections will be examined to determine whether signalization may be warranted per the criteria defined in the California supplement of the *Manual on Uniform Traffic Control Devices* (CA-MUTCD).

Sight Distance Analysis

A sight distance analysis will be conducted for the project driveways. This analysis will evaluate the sight distance and other potential safety issues pertaining to left-turn movements out of the project driveways.

Fair-Share Contributions (if Required)

A fair share percentage will be calculated for intersection improvements recommended in the TIA that are not included in the City's Development Fee (DIF) program, the SBCTA Nexus Study Fee program, or any other funding program. The percentage of fair share for the project will be calculated at each location using the total trips generated by the project divided by the total "new" traffic, which is the net increase in traffic volumes from existing to horizon year conditions.

CEQA ASSESSMENT - VEHICLE MILES TRAVELED ANALYSIS

The TIA will include a Vehicle Miles Traveled (VMT) analysis to meet CEQA requirements. The project VMT analysis will be prepared consistent with the City's TIA Guidelines. Per the City's TIA Guidelines, the project may be screened out because it is anticipated to generate fewer than 250 daily vehicle trips. Therefore, as per the City's TIA Guidelines, the project may be presumed to have a less than significant VMT impact and may be screened from a VMT analysis.

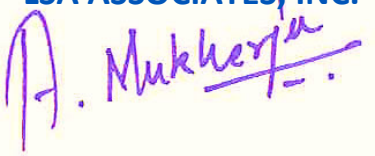
CEQA ASSESSMENT – ACTIVE TRANSPORTATION AND PUBLIC TRANSIT ANALYSIS

The TIA will include an analysis of potential project impacts on public transit, bicycle, and pedestrian facilities. Significant impacts would be determined based on whether the project conflicts with adopted policies, plans, or programs for these facilities, or whether the project decreases the performance or safety of these facilities.

Should you have any questions, please do not hesitate to contact me at (951) 781-9310 or email me at Ambarish.Mukherjee@lsa.net.

Sincerely,

LSA ASSOCIATES, INC.



Ambarish Mukherjee, AICP, PE
Principal

ATTACHMENTS

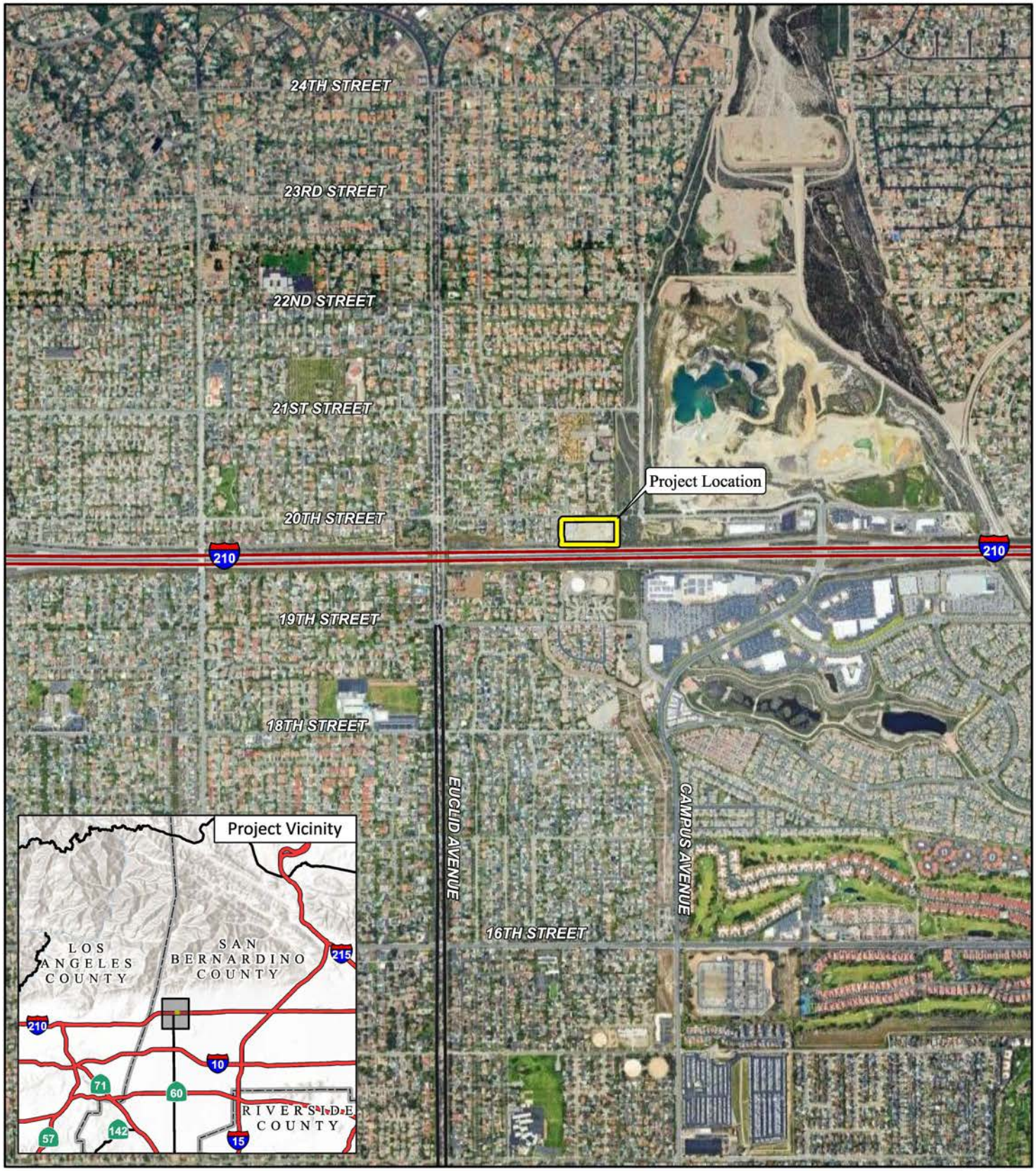
Figures

Figure 1: Regional and Project Location
Figure 2: Conceptual Site Plan
Figure 3: Study Area Intersections
Figure 4: Project Trip Distribution – Employees
Figure 5: Project Trip Distribution – Maintenance Trucks
Figure 6: Project Trip Distribution – Customers
Figure 7: Project Trip Assignment – Employees
Figure 8: Project Trip Assignment – Maintenance Trucks
Figure 9: Project Trip Assignment – Customers
Figure 10: Total Project Trip Assignment
Figure 11: Cumulative Project Locations

Tables

Table A: Project Trip Generation
Table B: Cumulative Projects

FIGURES



LSA

LEGEND

Project Location

FIGURE 1

N

0 830 1660

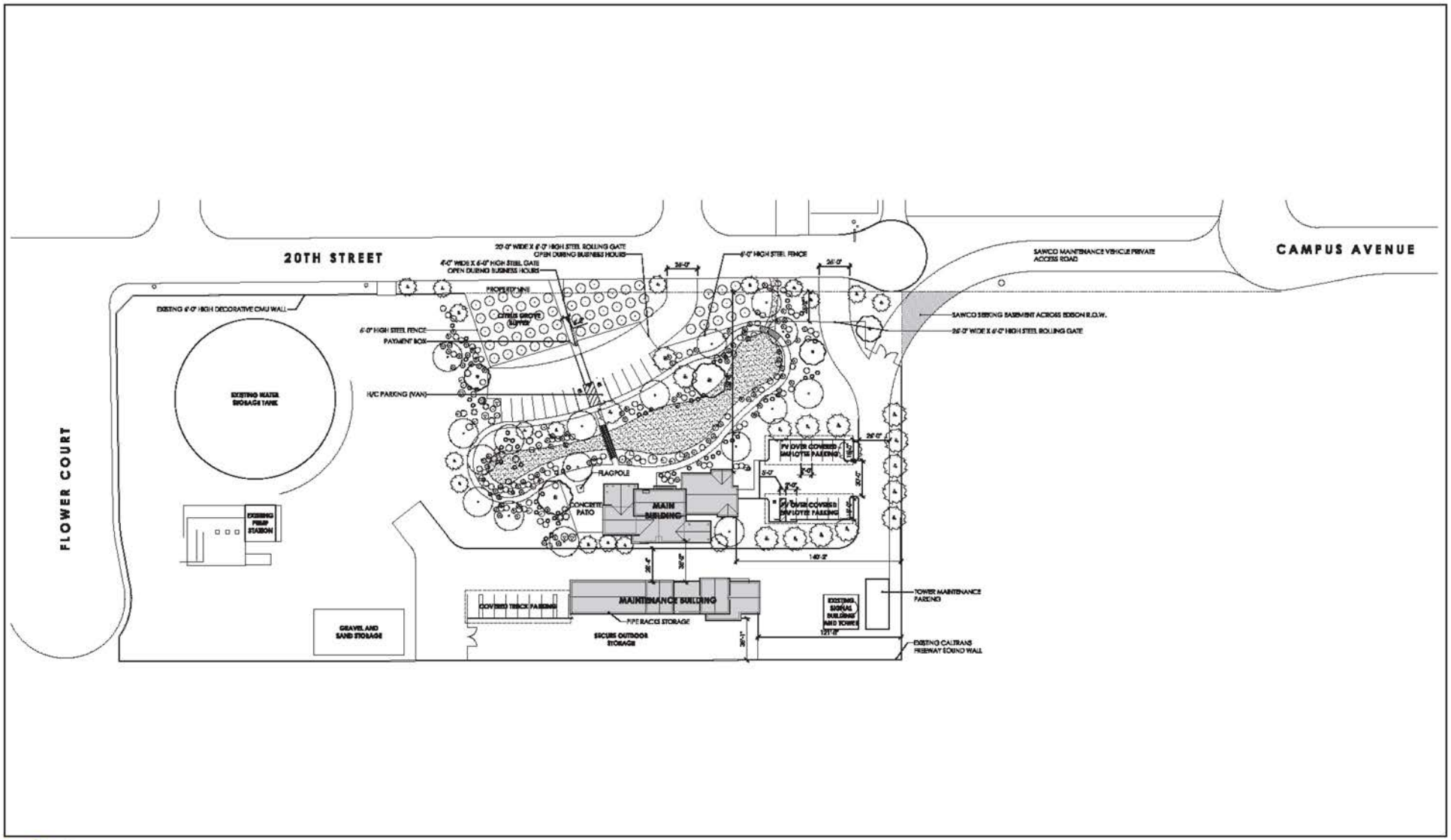
FEET

San Antonio Water Headquarters
Traffic Impact Analysis

Regional and Project Location

SOURCE: ESRI Streetmap, 2021; Google Earth, 2023

P:\20241723_San Antonio Driveway Expansion\PRODUCTS\Technical Studies\Traffic Analysis\GIS\Report\Fig 1_ Regional Project Location\Fig 1_ Regional Project Location.aprx (6/13/2024)



LSA

FIGURE 2

N

0 65 130

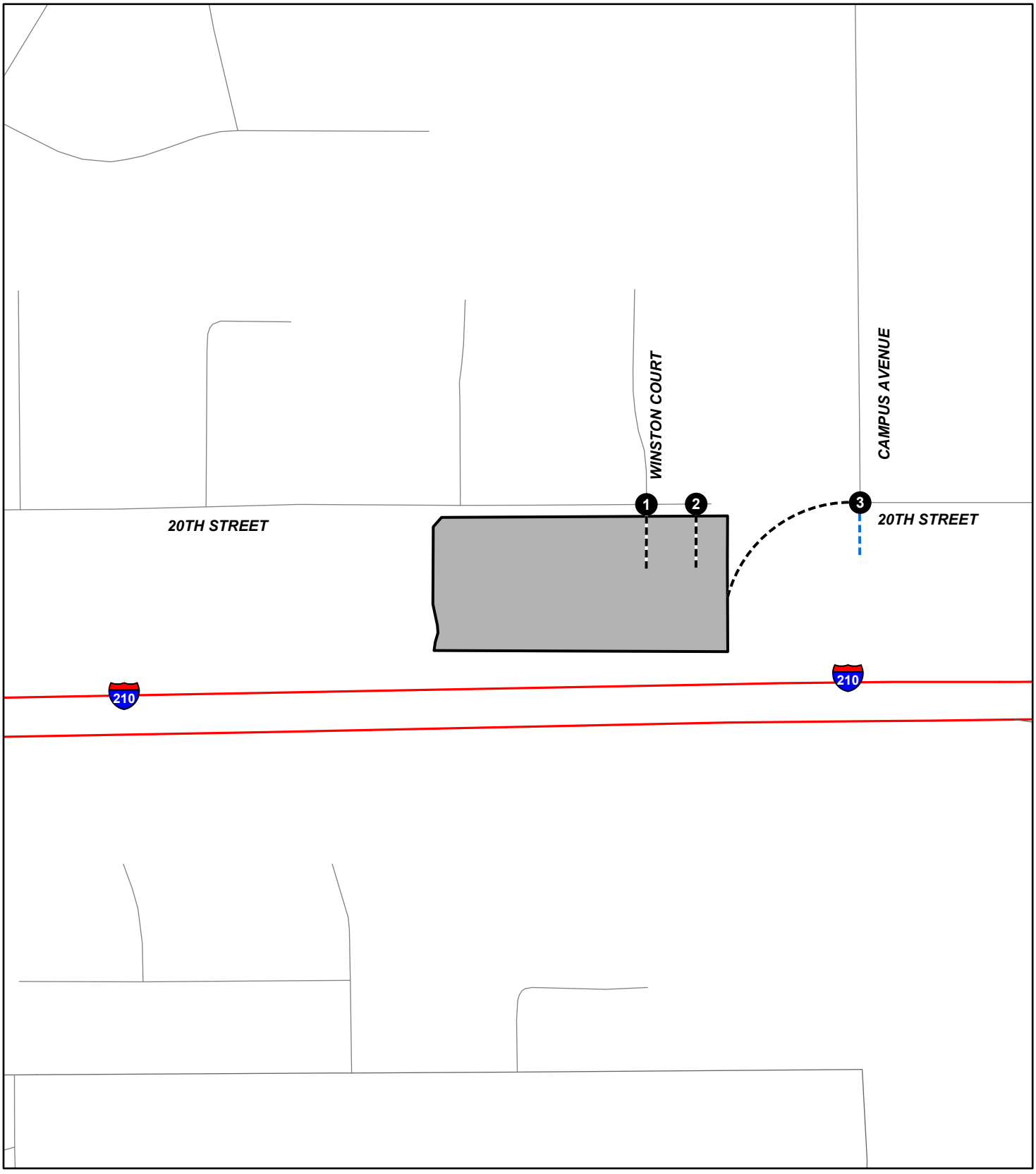
FEET

San Antonio Water Headquarters
Traffic Impact Analysis

Conceptual Site Plan

SOURCE: CEDG, Inc., August 2023

P:\20241723_San Antonio Driveway Expansion\PRODUCTS\Technical Studies\Traffic Analysis\GIS\Report\Fig 2_Conceptual Site Plan.ai (6/12/2024)



LSA

FIGURE 3

LEGEND

- Project Location
- Study Intersections
- Driveway
- Future Driveway

N

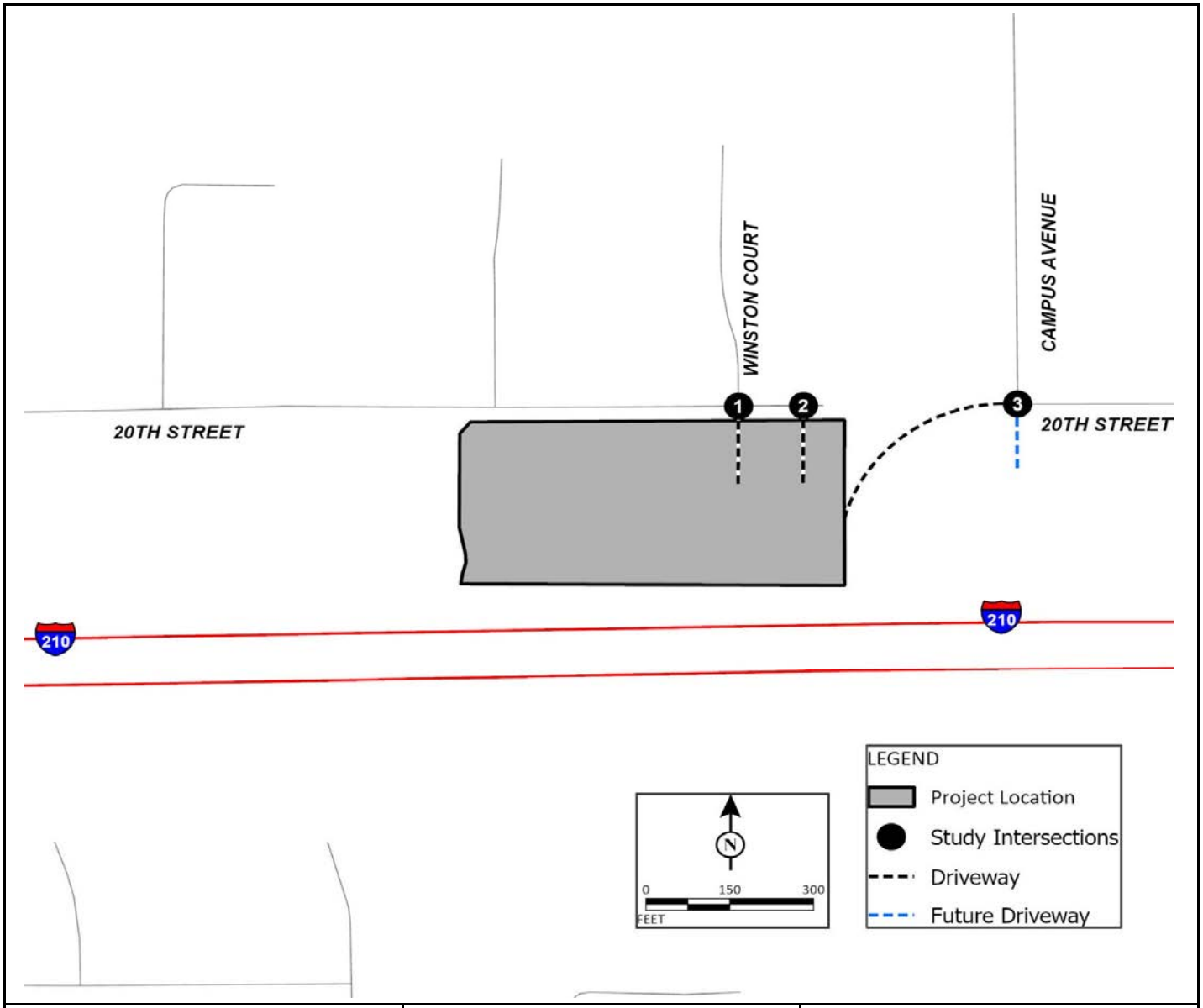
0 150 300

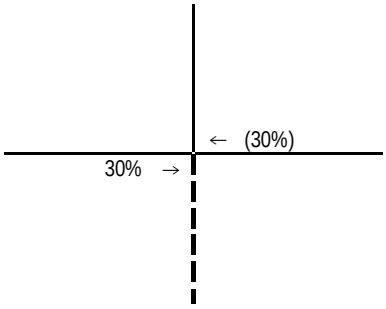
FEET

San Antonio Water Headquarters
Traffic Impact Analysis
Study Area Intersections

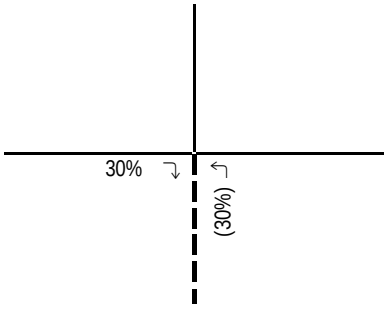
SOURCE:

P:\20241723_San Antonio Driveway Expansion\PRODUCTS\Technical Studies\Traffic Analysis\GIS\Report\San Antonio Water Headquarters\San Antonio Water Headquarters.aprx (7/26/2024)

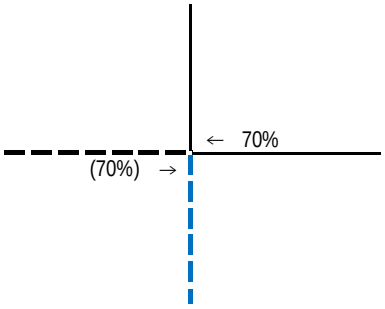




1 **Winston Court - Project Driveway 1/20th Street**



2 **Project Driveway 2/20th Street**



3 **Campus Avenue/Project Driveway 3 - 20th Street**

FIGURE 4

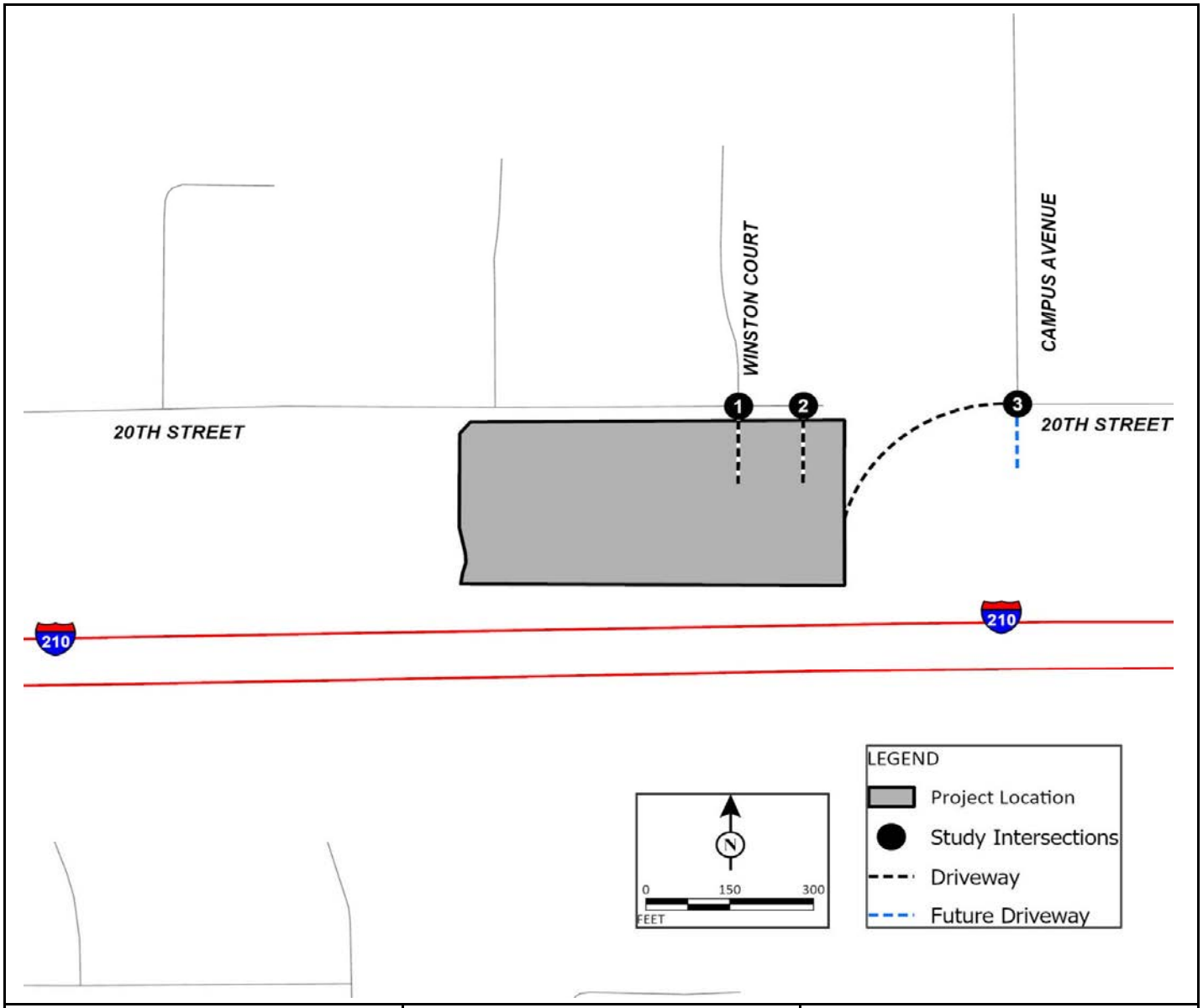
LSA

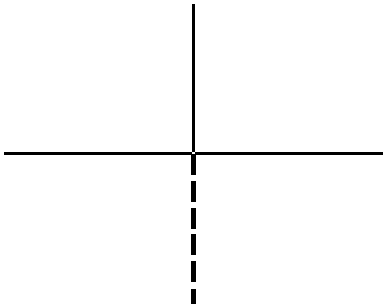
XX% (YY%)
Inbound (Outbound) Distribution

Project Driveway
Future Driveway

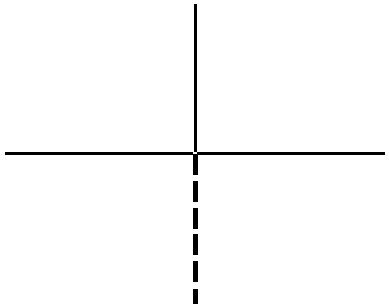
San Antonio Water Headquarters
Traffic Impact Analysis

Project Trip Distribution – Employees

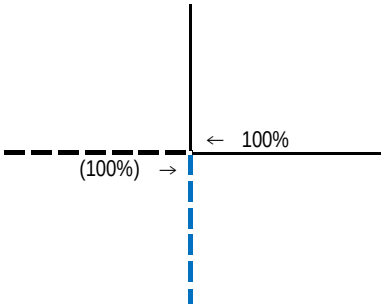




1 **Winston Court - Project Driveway 1/20th Street**



2 **Project Driveway 2/20th Street**



3 **Campus Avenue/Project Driveway 3 - 20th Street**

FIGURE 5

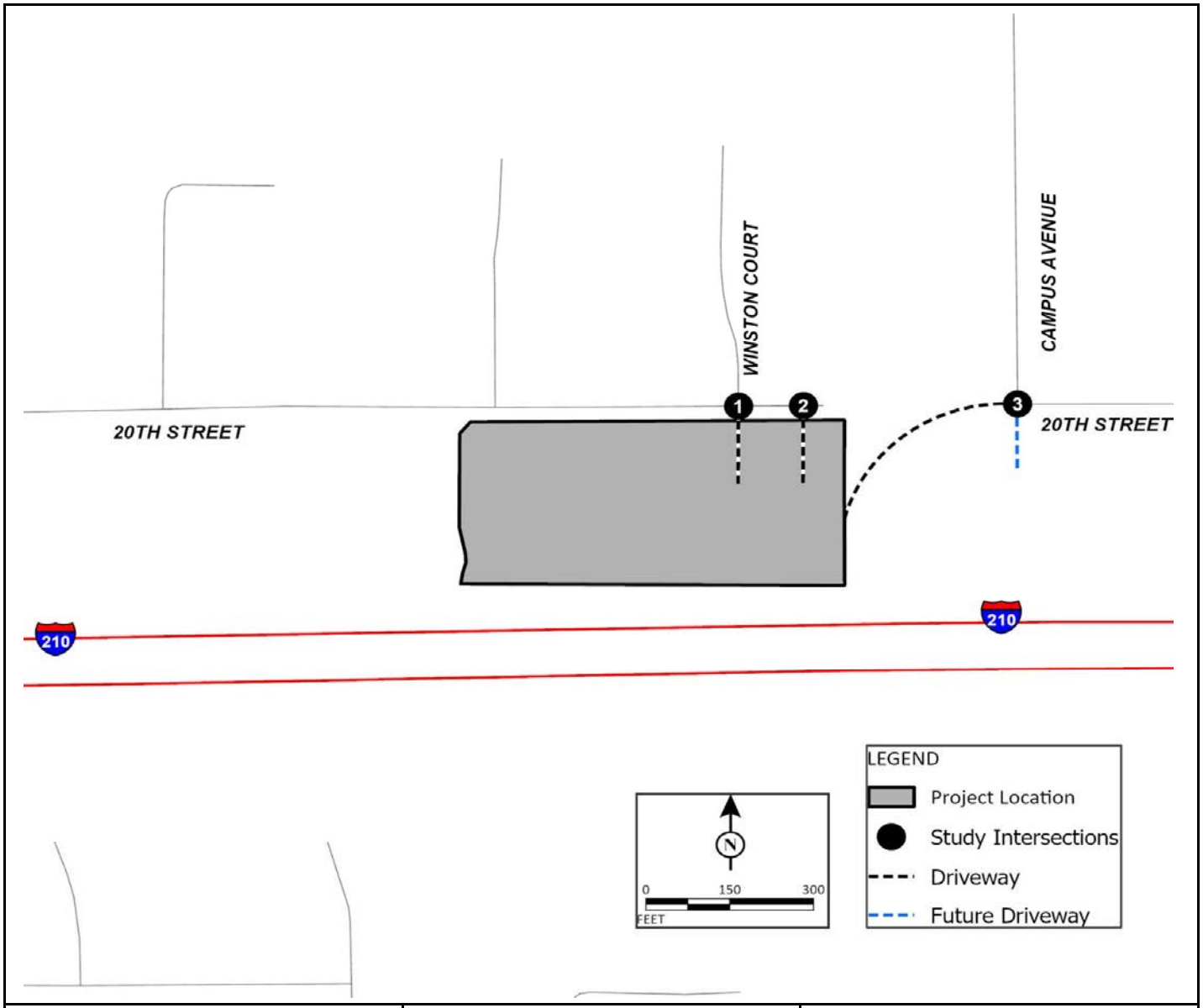
LSA

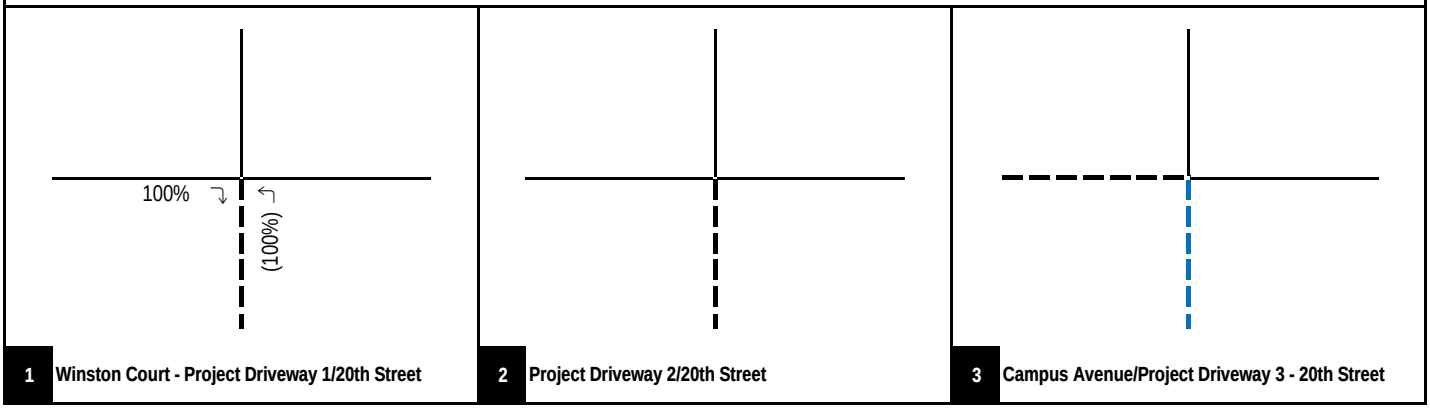
XXX% (YYY%)
Inbound (Outbound) Distribution

Project Driveway
Future Driveway

San Antonio Water Headquarters
Traffic Impact Analysis

Project Trip Distribution – Maintenance Trucks





1 **Winston Court - Project Driveway 1/20th Street**

2 **Project Driveway 2/20th Street**

3 **Campus Avenue/Project Driveway 3 - 20th Street**

FIGURE 6

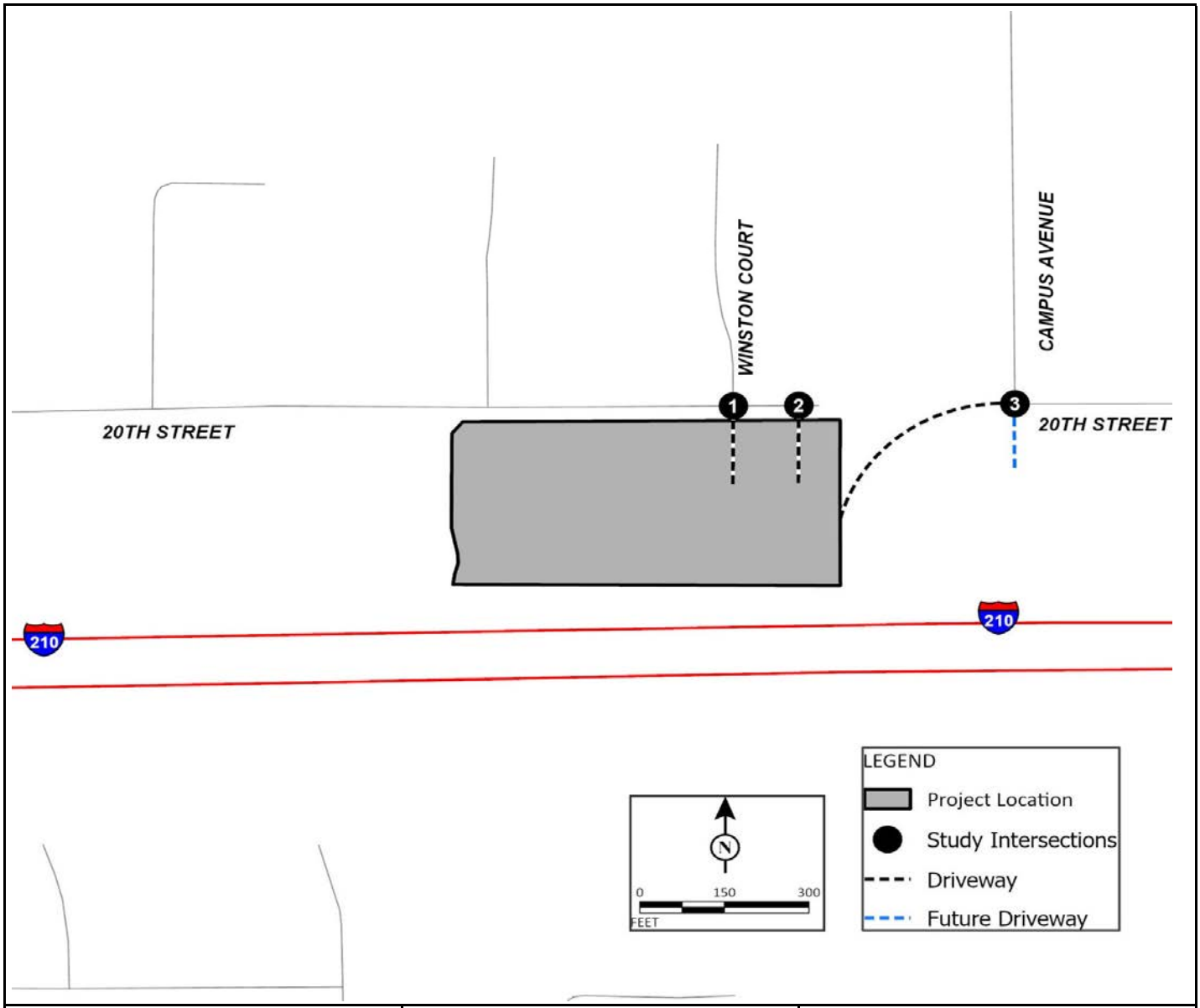
LSA

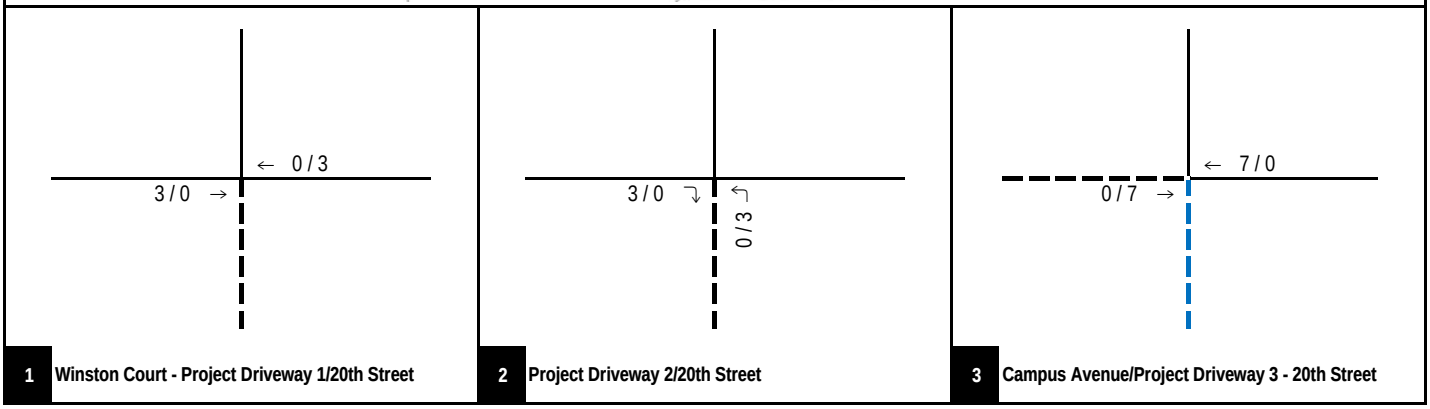
XXX% (YYY%)
Inbound (Outbound) Distribution

Project Driveway
Future Driveway

San Antonio Water Headquarters
Traffic Impact Analysis

Project Trip Distribution – Customers





1 Winston Court - Project Driveway 1/20th Street

2 Project Driveway 2/20th Street

3 Campus Avenue/Project Driveway 3 - 20th Street

FIGURE 7

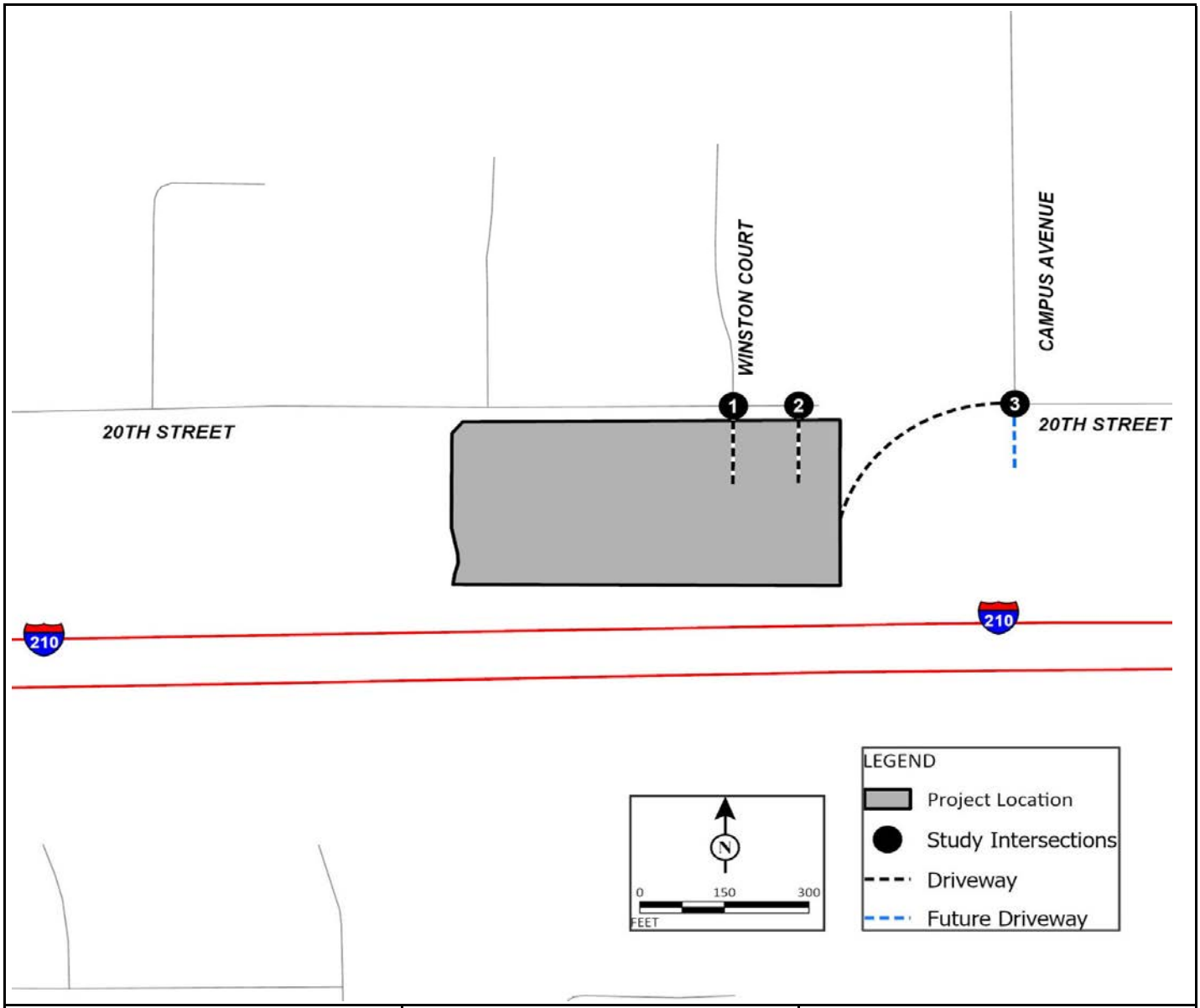
LSA

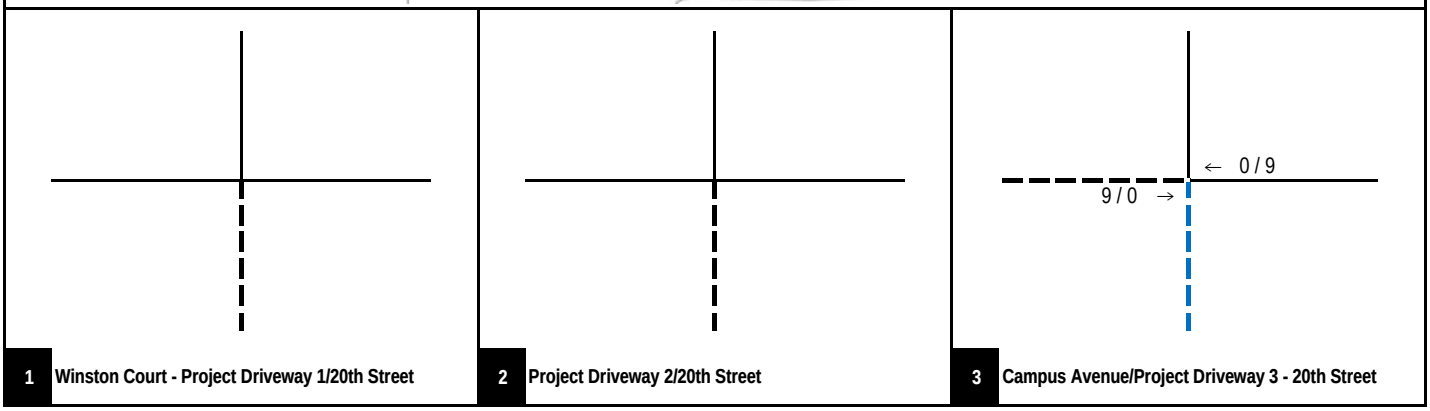
XX / YY
AM / PM Peak Hour Trips

Project Driveway
Future Driveway

San Antonio Water Headquarters
Traffic Impact Analysis

Project Trip Assignment – Employees





1 Winston Court - Project Driveway 1/20th Street

2 Project Driveway 2/20th Street

3 Campus Avenue/Project Driveway 3 - 20th Street

FIGURE 8

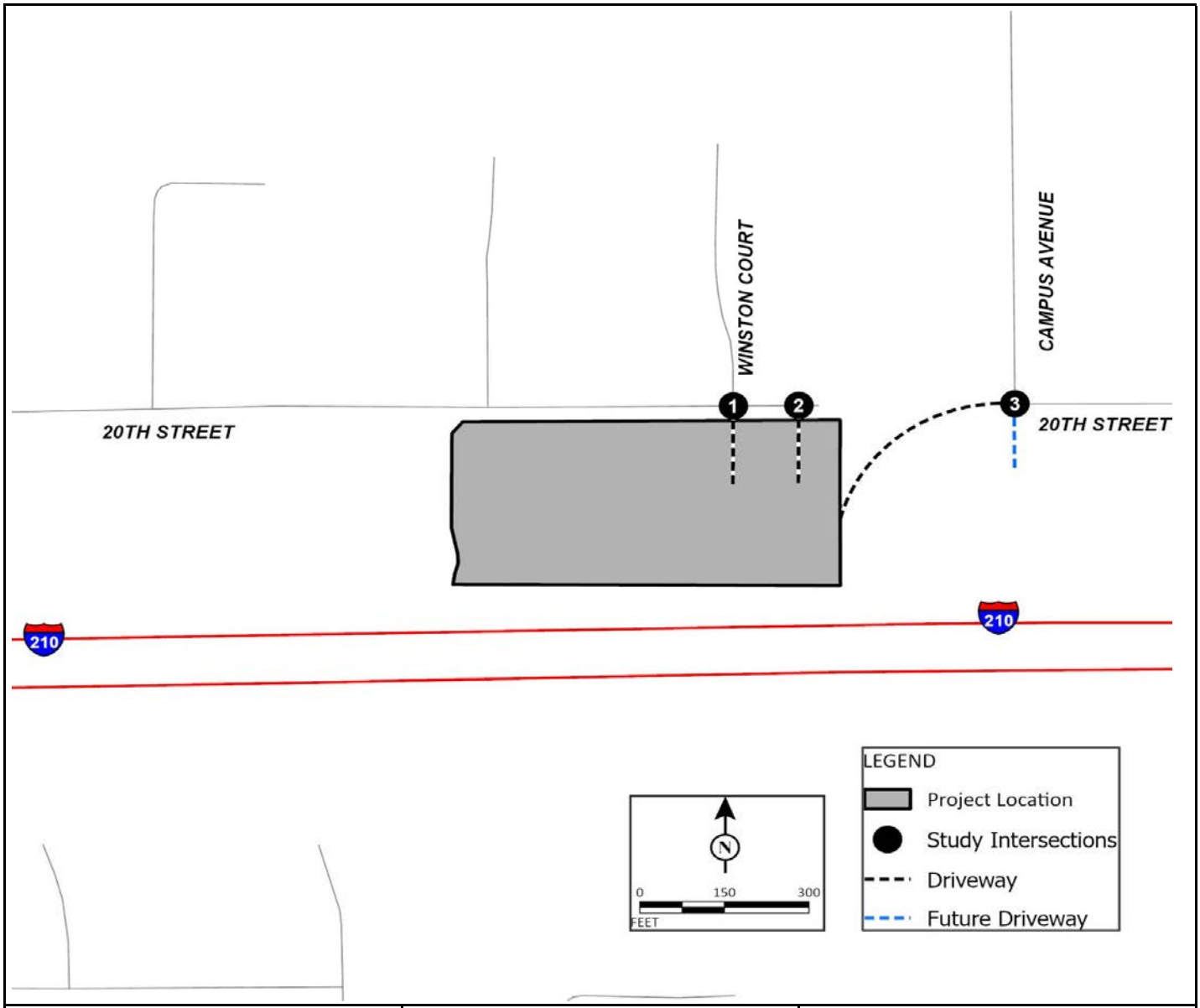
LSA

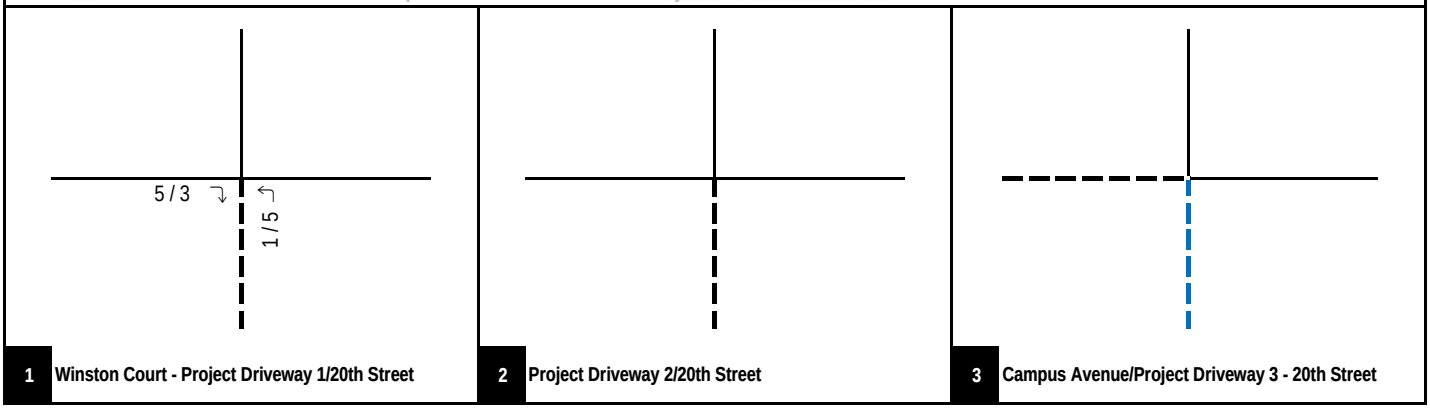
XX / YY
AM / PM Peak Hour PCE Trips

Project Driveway
Future Driveway

San Antonio Water Headquarters
Traffic Impact Analysis

Project Trip Assignment – Maintenance Trucks





1 Winston Court - Project Driveway 1/20th Street

2 Project Driveway 2/20th Street

3 Campus Avenue/Project Driveway 3 - 20th Street

FIGURE 9

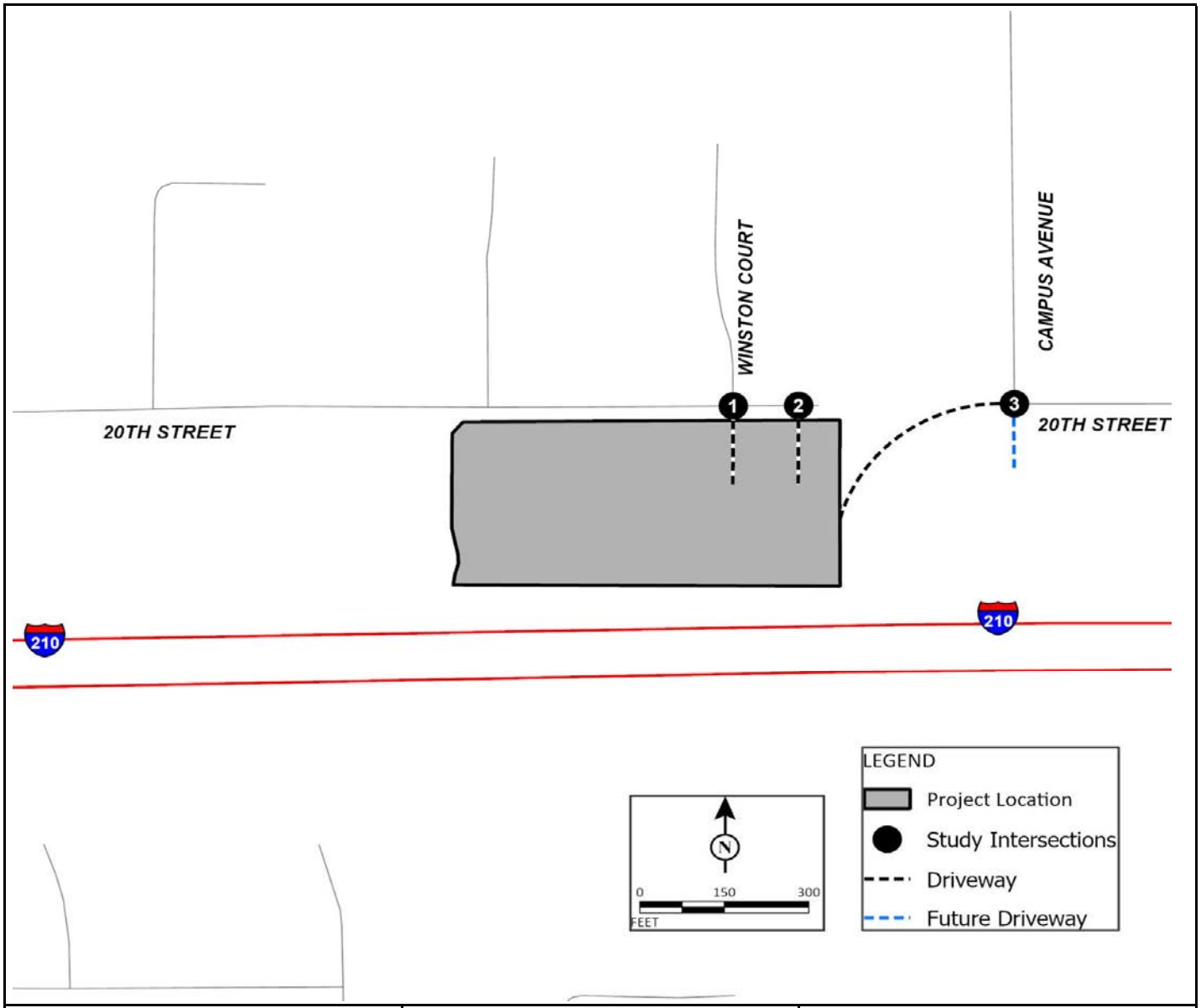
LSA

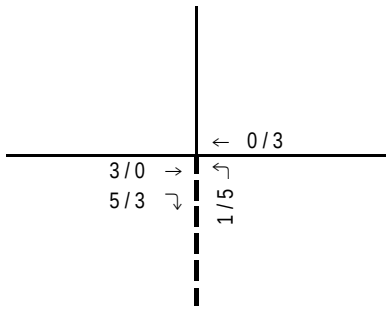
XX / YY
AM / PM Peak Hour Trips

Project Driveway
Future Driveway

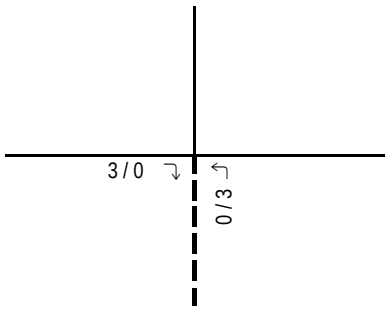
San Antonio Water Headquarters
Traffic Impact Analysis

Project Trip Assignment – Customers

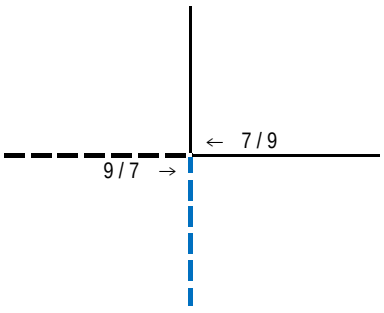




1 **Winston Court - Project Driveway 1/20th Street**



2 **Project Driveway 2/20th Street**



3 **Campus Avenue/Project Driveway 3 - 20th Street**

FIGURE 10

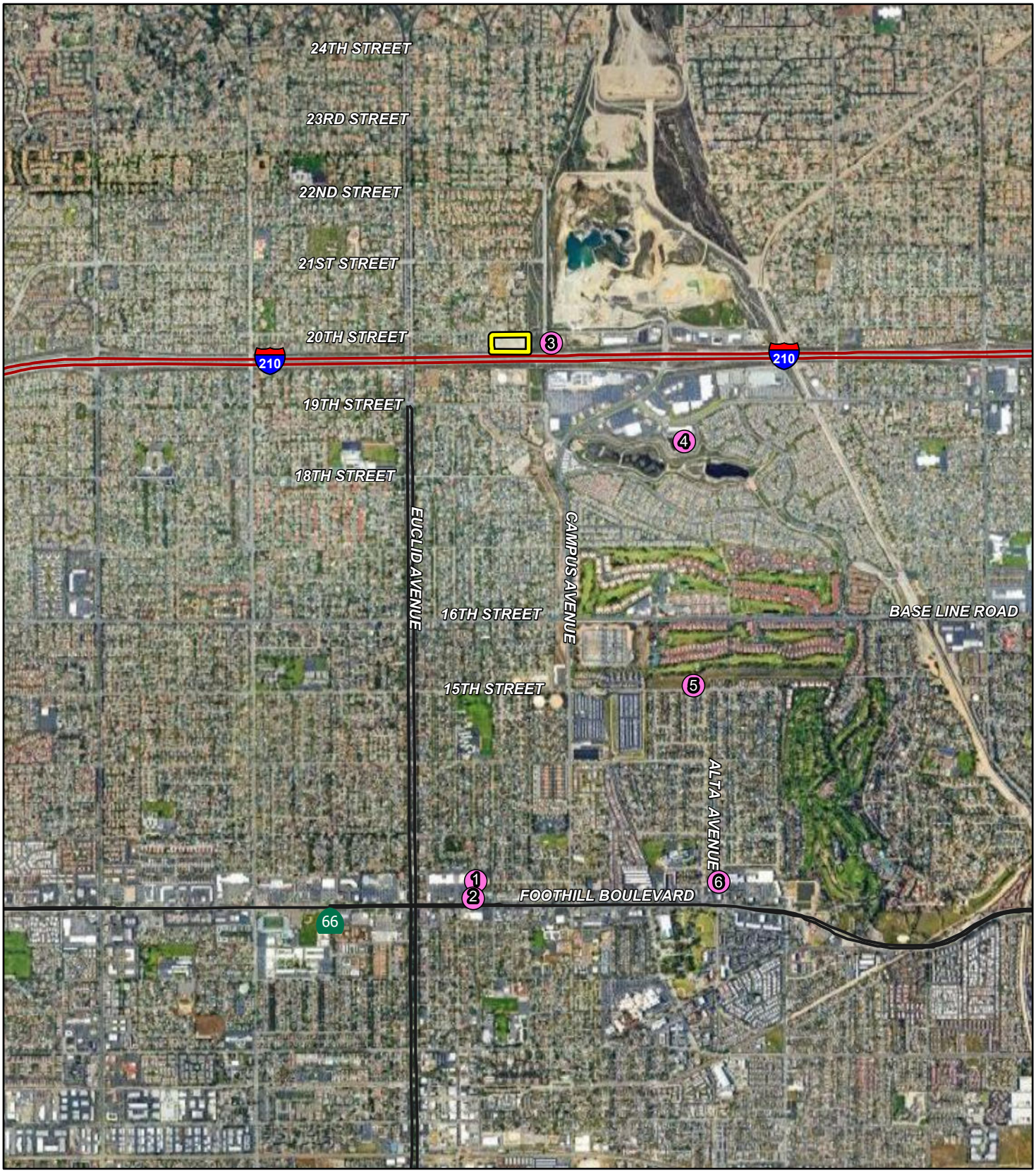
LSA

XX / YY
AM / PM Peak Hour PCE Trips

Project Driveway
Future Driveway

San Antonio Water Headquarters
Traffic Impact Analysis

Total Project Trip Assignment



LSA

LEGEND

Project Location

Cumulative Projects

FIGURE 11

N

0 1000 2000

FEET

San Antonio Water Headquarters
Traffic Impact Analysis

Cumulative Project Locations

SOURCE: ESRI Streetmap, 2021; Google Earth, 2023

P:\20241723_San Antonio Driveway Expansion\PRODUCTS\Technical Studies\Traffic Analysis\GIS\Report\Fig 1_ Regional Project Location\Fig 1_ Regional Project Location.aprx (7/19/2024)

TABLES

LSA

Table A - Project Trip Generation

Land Uses		Units	A.M. Peak Hour In	A.M. Peak Hour Out	A.M. Peak Hour Total	P.M. Peak Hour In	P.M. Peak Hour Out	P.M. Peak Hour Total	Daily
San Antonio Water Headquarters & Maintenance Buildings									
Employee Trip Generation [1]			10	0	10	0	10	10	20
Employee Maintenance Truck Trip Generation [2]			0	6	6	6	0	6	12
Employee Maintenance Truck PCE Trip Generation [3]			0	9	9	9	0	9	18
Headquarter Building									
Headquarters Building Trip/Unit [4]	3.698	TSF	1.37	0.30	1.67	0.73	1.43	2.16	14.39
Headquarters Building Customer Trip Generation			5	1	6	3	5	8	53
Total PCE Trip Generation			**15**	**10**	**25**	**12**	**15**	**27**	**91**

Notes:

TSF = thousand square-feet

[1] The employee trip generation was developed based on the project description and operational information.

[2] The maintenance truck trip generation was developed based on the project's operational information. All trucks are 2-axle trucks.

[3] All maintenance truck trips were converted to passenger PCEs using a 1.5 PCE factor for 2-axle trucks based on City of Upland's *Traffic Impact Analysis Guidelines* , dated July 2020.

[4] Rates from Institute of Transportation Engineers (ITE) *Trip Generation Manual* , (11th Edition) for Land Use 712 - "Small Office Building" , Setting/Location - 'General Urban/Suburban'.

LSA

Table B - Cumulative Projects

ID	Jurisdiction	Project Name/Reference	Address/Location	Project Description	Project Units/Area/Other
1	Upland	Amazon Fresh	235 East Foothill Boulevard	Grocery Store	35.000 TSF
2	Upland	Starbucks	275 East Foothill Boulevard	Drive-Through Coffee Shop	1.200 TSF
3	Upland	The Colonies Self Storage	Southeast Corner of 20th Street and Campus Avenue	Self Storage	164.570 TSF
4	Upland	Colony Condos	1160 East 19th Street	Multi-Family Residential	60 DU
5	Upland	Villa Serena	15th Street, between Fernando Avenue and Monte Verde Avenue	Single-Family Residential	65 DU
6	Upland	Upland Oncology Center	1113 North Alta Avenue	Medical Building	3.361 TSF

Notes:

DU = Dwelling Units; TSF = Thousand Square Feet.

APPENDIX B

TRAFFIC COUNT SHEETS

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Upland
N/S: Winston Court
E/W: E 20th Street
Weather: Clear

File Name : 01_UPL_Win_20th AM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

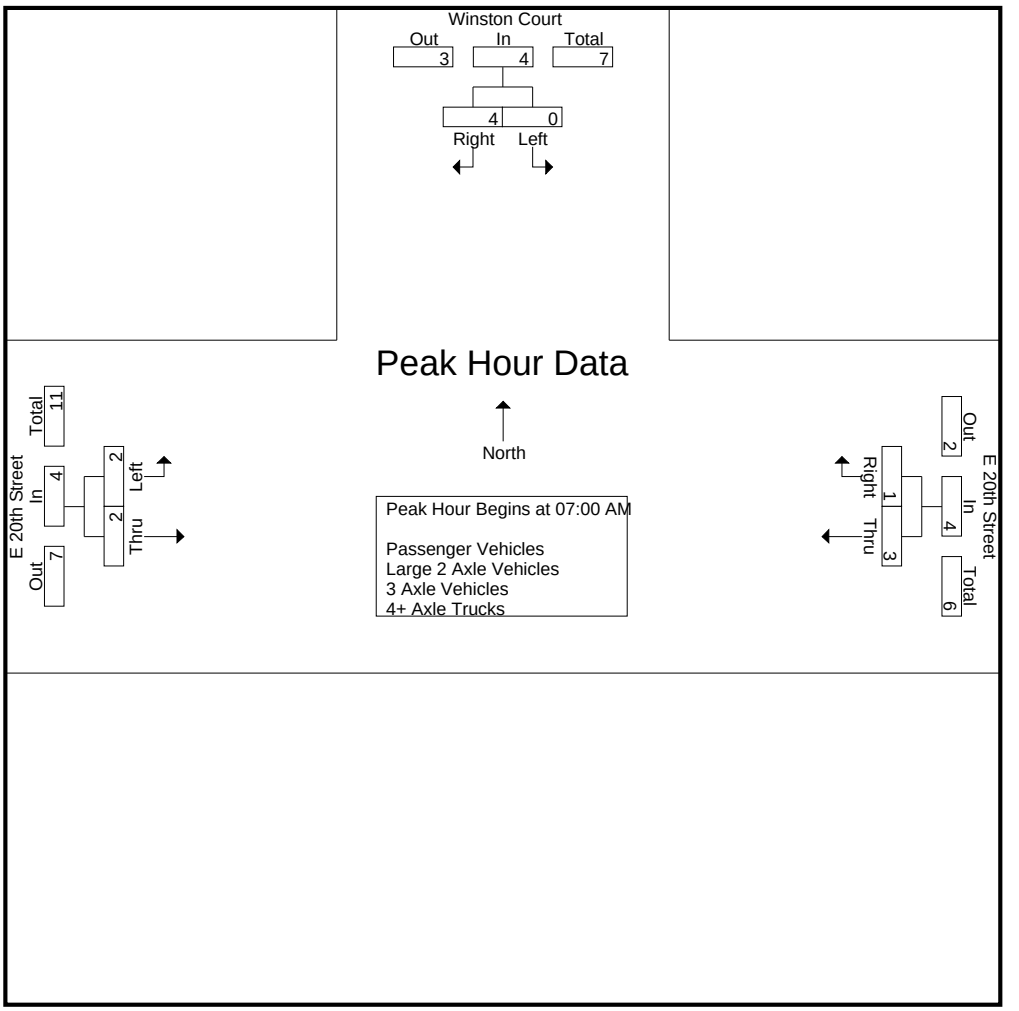
	Winston Court Southbound			E 20th Street Westbound			E 20th Street Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
07:00 AM	0	1	1	1	0	1	2	0	2	4
07:15 AM	0	0	0	1	0	1	0	1	1	2
07:30 AM	0	0	0	1	0	1	0	1	1	2
07:45 AM	0	3	3	0	1	1	0	0	0	4
Total	0	4	4	3	1	4	2	2	4	12
08:00 AM	0	0	0	0	0	0	1	0	1	1
08:15 AM	0	2	2	0	0	0	0	0	0	2
08:30 AM	0	0	0	0	0	0	1	0	1	1
08:45 AM	0	1	1	0	0	0	2	0	2	3
Total	0	3	3	0	0	0	4	0	4	7
Grand Total	0	7	7	3	1	4	6	2	8	19
Apprch %	0	100		75	25		75	25		
Total %	0	36.8	36.8	15.8	5.3	21.1	31.6	10.5	42.1	
Passenger Vehicles	0	6	6	1	0	1	6	0	6	13
% Passenger Vehicles	0	85.7	85.7	33.3	0	25	100	0	75	68.4
Large 2 Axle Vehicles	0	0	0	2	0	2	0	1	1	3
% Large 2 Axle Vehicles	0	0	0	66.7	0	50	0	50	12.5	15.8
3 Axle Vehicles	0	1	1	0	1	1	0	1	1	3
% 3 Axle Vehicles	0	14.3	14.3	0	100	25	0	50	12.5	15.8
4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0
% 4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0

	Winston Court Southbound			E 20th Street Westbound			E 20th Street Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	1	1	**1**	0	**1**	**2**	0	**2**	**4**
07:15 AM	0	0	0	1	0	1	0	**1**	1	2
07:30 AM	0	0	0	1	0	1	0	1	1	2
07:45 AM	0	**3**	**3**	0	**1**	1	0	0	0	4
Total Volume	0	4	4	3	1	4	2	2	4	12
% App. Total	0	100		75	25		50	50		
PHF	.000	.333	.333	.750	.250	1.00	.250	.500	.500	.750

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Upland
N/S: Winston Court
E/W: E 20th Street
Weather: Clear

File Name : 01_UPL_Win_20th AM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	**1**	0	**1**	**2**	0	**2**
+15 mins.	0	**3**	**3**	1	0	1	0	**1**	1
+30 mins.	0	0	0	1	0	1	0	1	1
+45 mins.	0	2	2	0	**1**	1	0	0	0
Total Volume	0	5	5	3	1	4	2	2	4
% App. Total	0	100		75	25		50	50	
PHF	.000	.417	.417	.750	.250	1.000	.250	.500	.500

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
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City of Upland
N/S: Winston Court
E/W: E 20th Street
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File Name : 01_UPL_Win_20th AM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 1

Groups Printed- Passenger Vehicles

	Winston Court Southbound			E 20th Street Westbound			E 20th Street Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
07:00 AM	0	1	1	1	0	1	2	0	2	4
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	2	2	0	0	0	0	0	0	2
Total	0	3	3	1	0	1	2	0	2	6
08:00 AM	0	0	0	0	0	0	1	0	1	1
08:15 AM	0	2	2	0	0	0	0	0	0	2
08:30 AM	0	0	0	0	0	0	1	0	1	1
08:45 AM	0	1	1	0	0	0	2	0	2	3
Total	0	3	3	0	0	0	4	0	4	7
Grand Total	0	6	6	1	0	1	6	0	6	13
Apprch %	0	100		100	0		100	0		
Total %	0	46.2	46.2	7.7	0	7.7	46.2	0	46.2	

	Winston Court Southbound			E 20th Street Westbound			E 20th Street Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	1	1	**1**	0	**1**	**2**	0	**2**	**4**
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	**2**	**2**	0	0	0	0	0	0	2
Total Volume	0	3	3	1	0	1	2	0	2	6
% App. Total	0	100		100	0		100	0		
PHF	.000	.375	.375	.250	.000	.250	.250	.000	.250	.375

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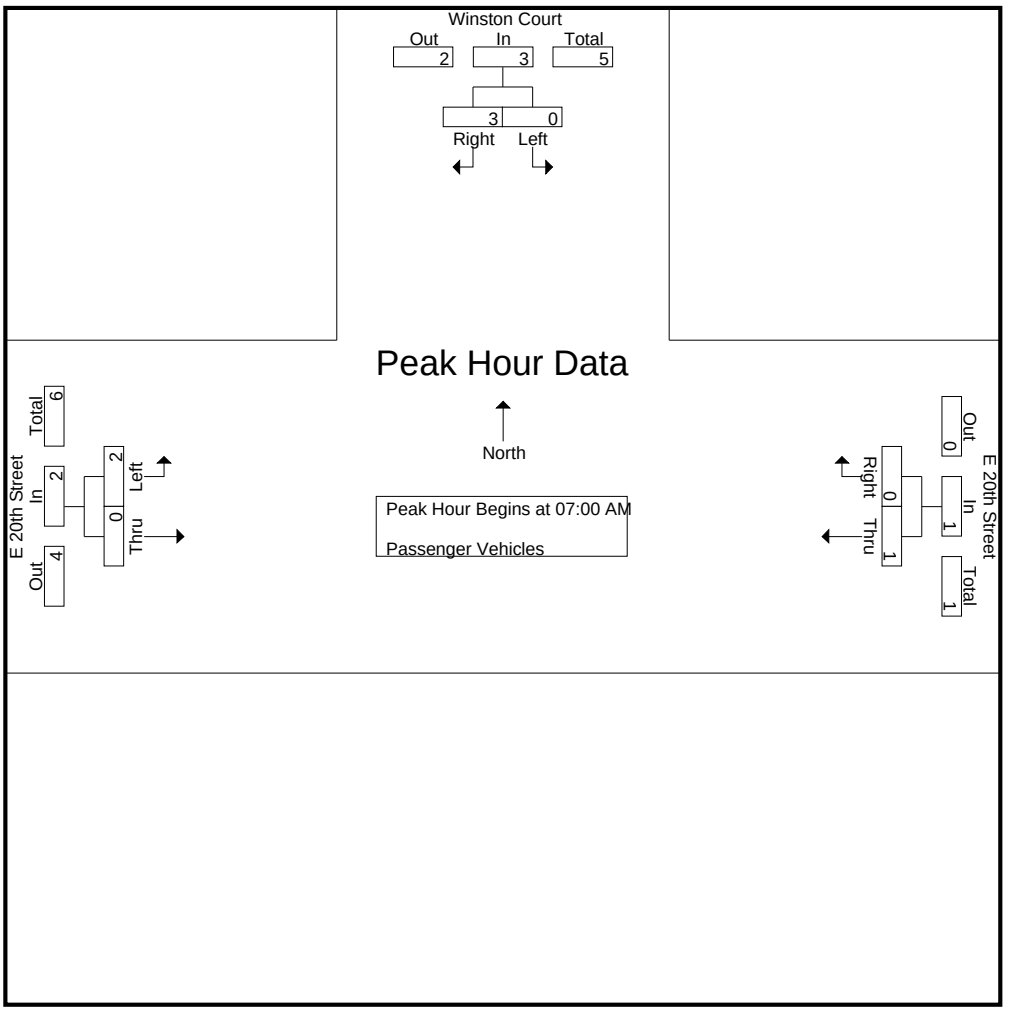
City of Upland
N/S: Winston Court
E/W: E 20th Street
Weather: Clear

File Name : 01_UPL_Win_20th AM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 2



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	1	1	**1**	0	**1**	**2**	0	**2**
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	**2**	**2**	0	0	0	0	0	0
Total Volume	0	3	3	1	0	1	2	0	2
% App. Total	0	100		100	0		100	0	
PHF	.000	.375	.375	.250	.000	.250	.250	.000	.250

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City of Upland
N/S: Winston Court
E/W: E 20th Street
Weather: Clear

File Name : 01_UPL_Win_20th AM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

	Winston Court Southbound			E 20th Street Westbound			E 20th Street Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	1	0	1	0	1	1	2
07:30 AM	0	0	0	1	0	1	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	2	0	2	0	1	1	3
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	2	0	2	0	1	1	3
Apprch %	0	0		100	0		0	100		
Total %	0	0	0	66.7	0	66.7	0	33.3	33.3	

	Winston Court Southbound			E 20th Street Westbound			E 20th Street Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	**1**	0	**1**	0	**1**	**1**	**2**
07:30 AM	0	0	0	1	0	1	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	2	0	2	0	1	1	3
% App. Total	0	0		100	0		0	100		
PHF	.000	.000	.000	.500	.000	.500	.000	.250	.250	.375

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N/S: Winston Court
E/W: E 20th Street
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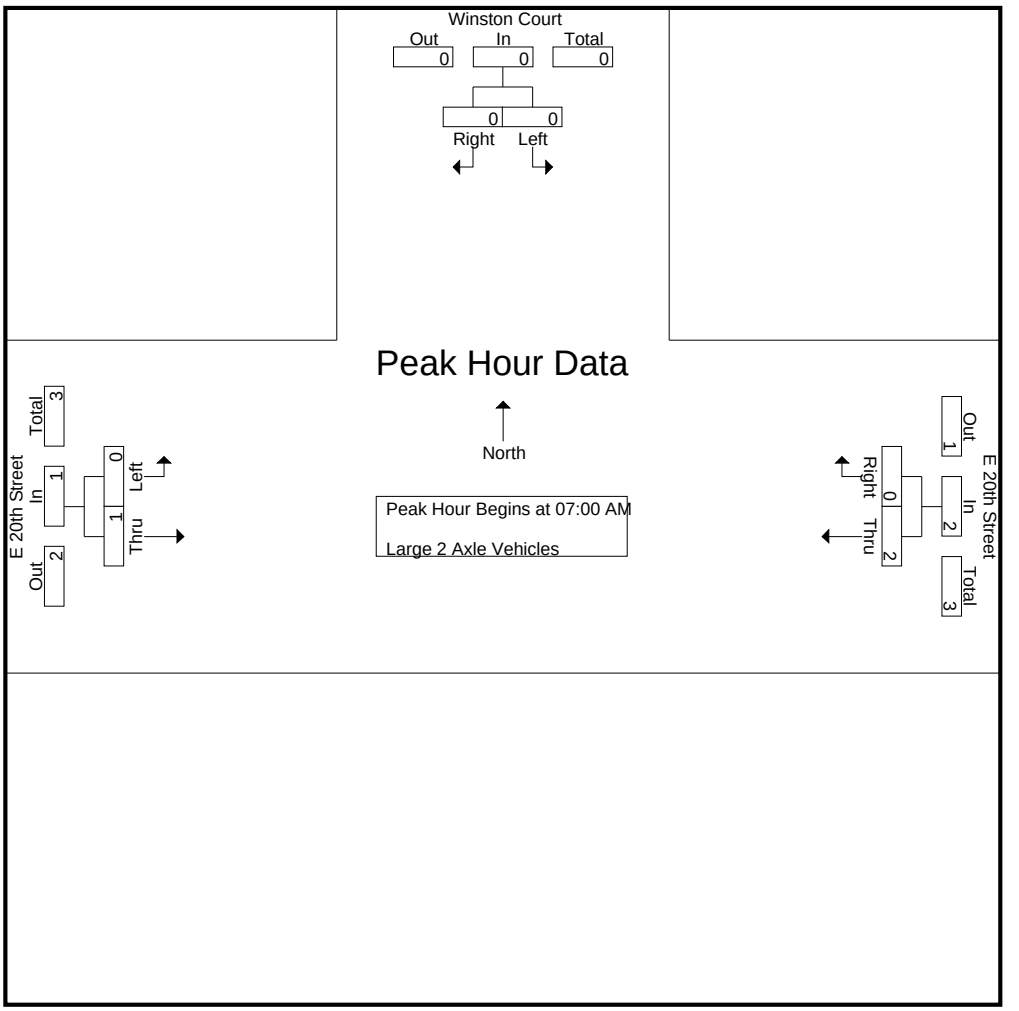
File Name : 01_UPL_Win_20th AM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 2



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	**1**	0	**1**	0	**1**	**1**
+30 mins.	0	0	0	1	0	1	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	2	0	2	0	1	1
% App. Total	0	0		100	0		0	100	
PHF	.000	.000	.000	.500	.000	.500	.000	.250	.250

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E/W: E 20th Street
Weather: Clear

File Name : 01_UPL_Win_20th AM
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Groups Printed- 3 Axle Vehicles

	Winston Court Southbound			E 20th Street Westbound			E 20th Street Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	1	1	1
07:45 AM	0	1	1	0	1	1	0	0	0	2
Total	0	1	1	0	1	1	0	1	1	3
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	1	1	0	1	1	0	1	1	3
Apprch %	0	100		0	100		0	100		
Total %	0	33.3	33.3	0	33.3	33.3	0	33.3	33.3	

	Winston Court Southbound			E 20th Street Westbound			E 20th Street Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	**1**	**1**	1
07:45 AM	0	**1**	**1**	0	**1**	**1**	0	0	0	**2**
Total Volume	0	1	1	0	1	1	0	1	1	3
% App. Total	0	100		0	100		0	100		
PHF	.000	.250	.250	.000	.250	.250	.000	.250	.250	.375

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City of Upland
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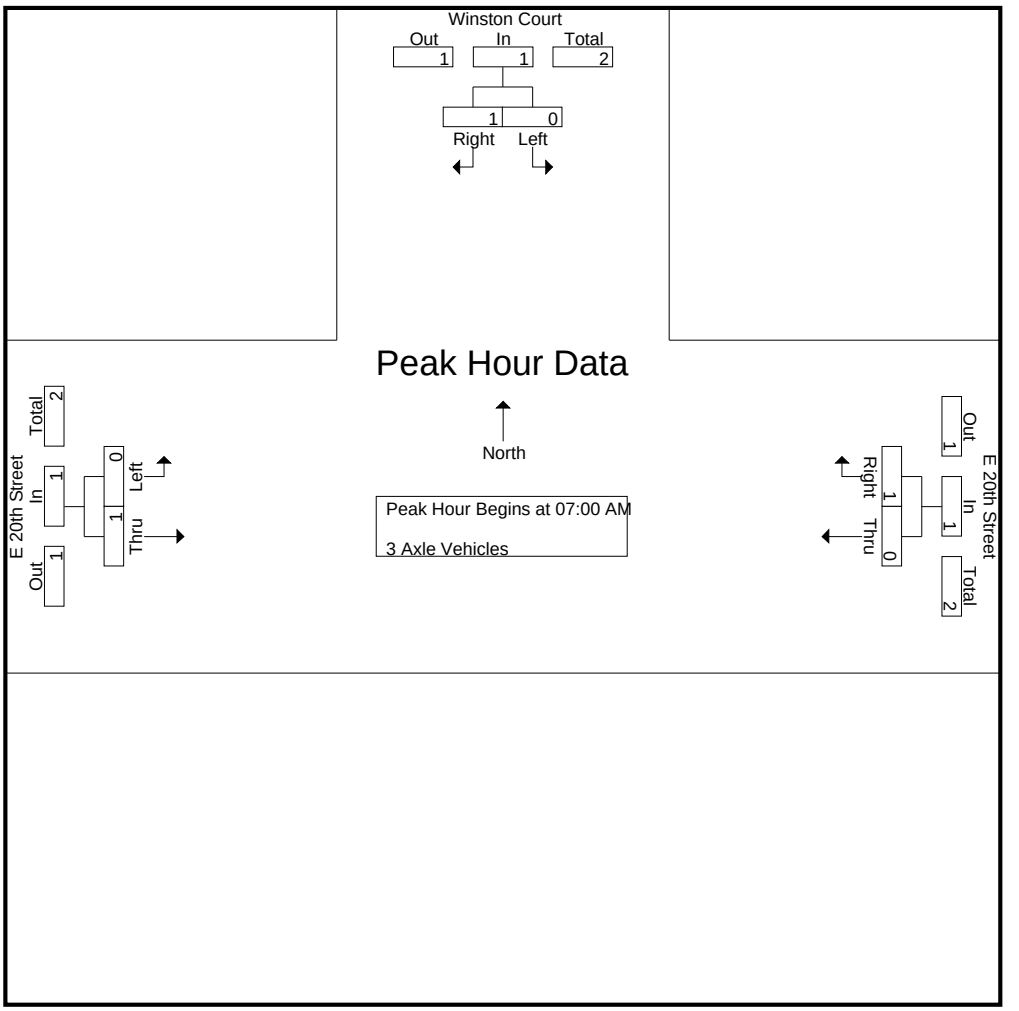
E/W: E 20th Street
Weather: Clear

File Name : 01_UPL_Win_20th AM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 2



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	**1**	**1**
+45 mins.	0	**1**	**1**	0	**1**	**1**	0	0	0
Total Volume	0	1	1	0	1	1	0	1	1
% App. Total	0	100		0	100		0	100	
PHF	.000	.250	.250	.000	.250	.250	.000	.250	.250

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E/W: E 20th Street
Weather: Clear

File Name : 01_UPL_Win_20th AM
Site Code : 00324879
Start Date : 10/10/2024

Groups Printed- 4+ Axle Trucks

	Winston Court Southbound			E 20th Street Westbound			E 20th Street Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0		0	0		0	0		
Total %										

	Winston Court Southbound			E 20th Street Westbound			E 20th Street Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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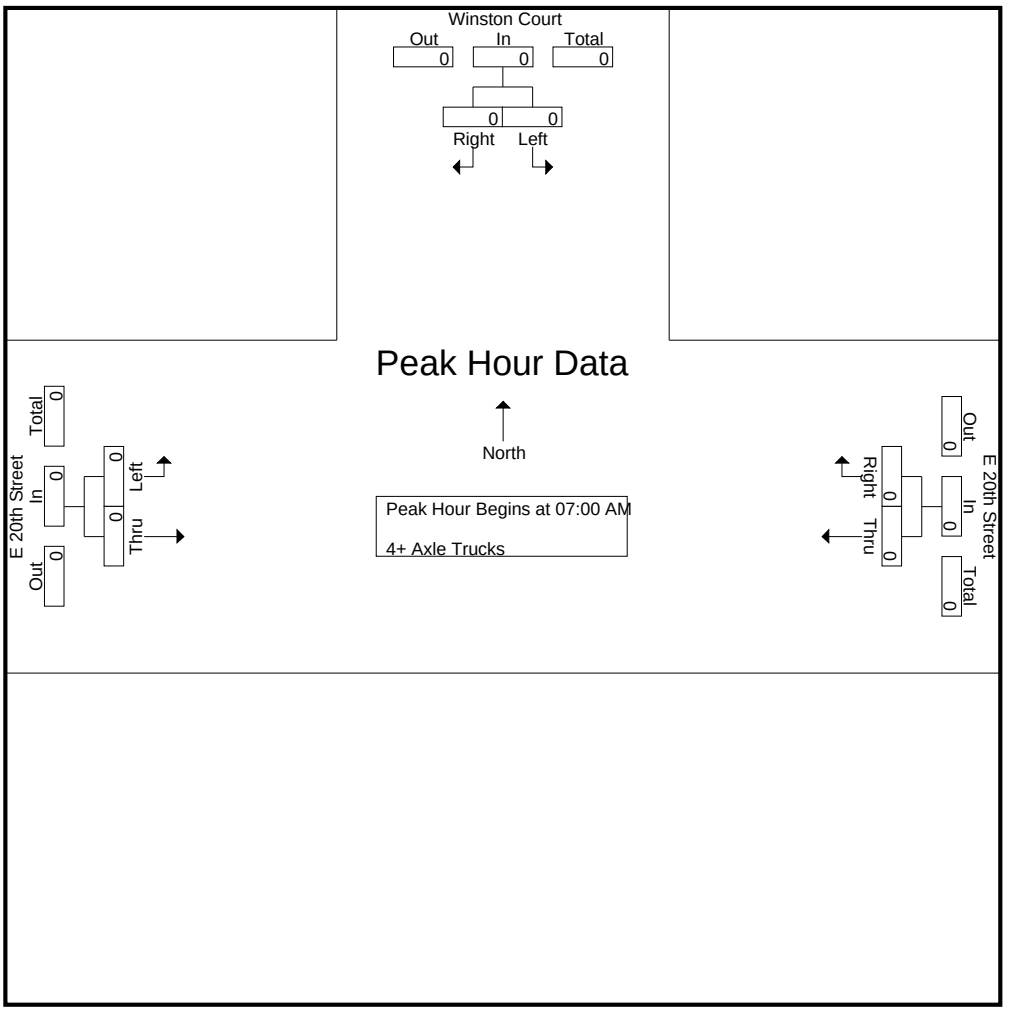
File Name : 01_UPL_Win_20th AM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 2



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

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File Name : 01_UPL_Win_20th PM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

	Winston Court Southbound			E 20th Street Westbound			E 20th Street Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
04:00 PM	0	1	1	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	1	0	1	1
04:30 PM	0	1	1	0	0	0	1	0	1	2
04:45 PM	0	2	2	0	0	0	1	0	1	3
Total	0	4	4	0	0	0	3	0	3	7
05:00 PM	0	0	0	0	0	0	2	0	2	2
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	2	1	3	3
Total	0	0	0	0	0	0	4	1	5	5
Grand Total	0	4	4	0	0	0	7	1	8	12
Apprch %	0	100		0	0		87.5	12.5		
Total %	0	33.3	33.3	0	0	0	58.3	8.3	66.7	
Passenger Vehicles	0	4	4	0	0	0	7	1	8	12
% Passenger Vehicles	0	100	100	0	0	0	100	100	100	100
Large 2 Axle Vehicles	0	0	0	0	0	0	0	0	0	0
% Large 2 Axle Vehicles	0	0	0	0	0	0	0	0	0	0
3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0
% 3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0
4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0
% 4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0

	Winston Court Southbound			E 20th Street Westbound			E 20th Street Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	0	0	0	0	0	0	1	0	1	1
04:30 PM	0	1	1	0	0	0	1	0	1	2
04:45 PM	0	**2**	**2**	0	0	0	1	0	1	**3**
05:00 PM	0	0	0	0	0	0	**2**	0	**2**	2
Total Volume	0	3	3	0	0	0	5	0	5	8
% App. Total	0	100		0	0		100	0		
PHF	.000	.375	.375	.000	.000	.000	.625	.000	.625	.667

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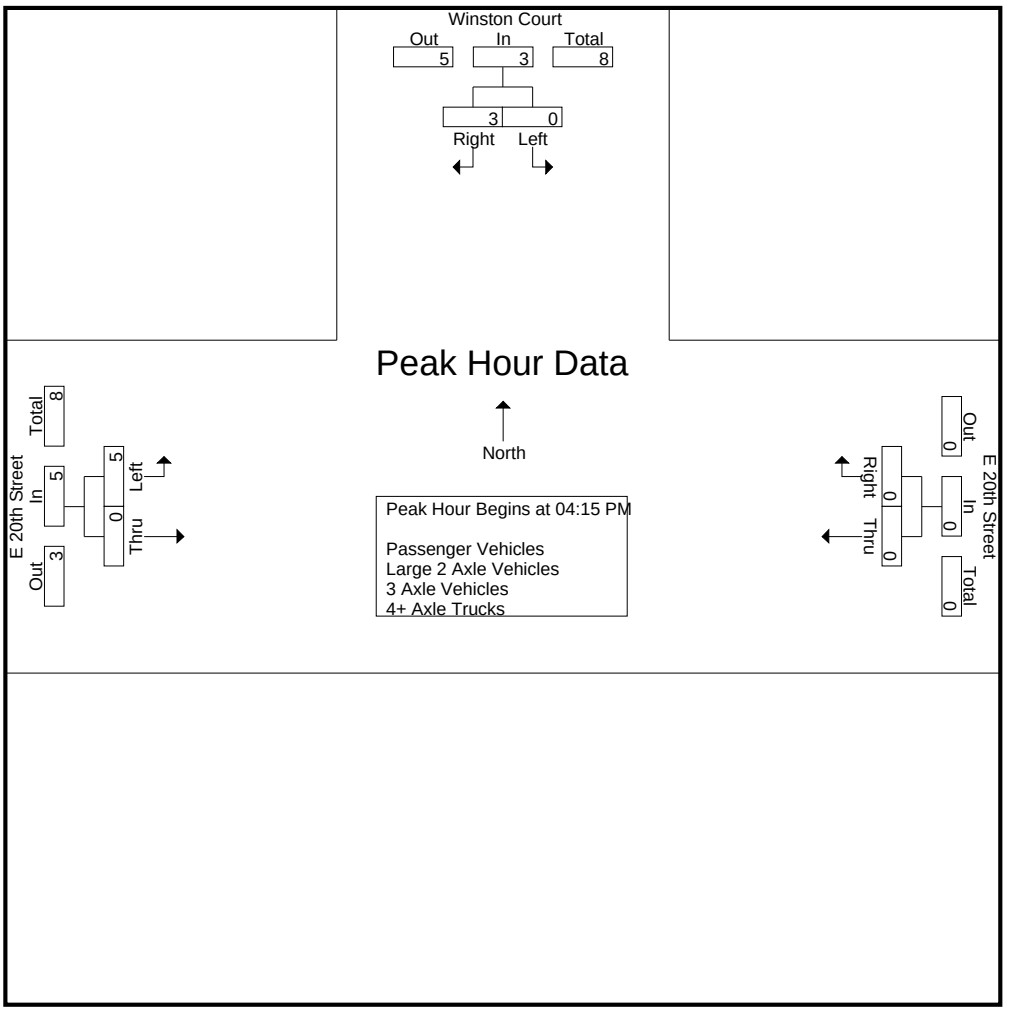
Weather: Clear

File Name : 01_UPL_Win_20th PM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM			04:00 PM			04:15 PM		
+0 mins.	0	1	1	0	0	0	1	0	1
+15 mins.	0	0	0	0	0	0	1	0	1
+30 mins.	0	1	1	0	0	0	1	0	1
+45 mins.	0	**2**	**2**	0	0	0	**2**	0	**2**
Total Volume	0	4	4	0	0	0	5	0	5
% App. Total	0	100		0	0		100	0	
PHF	.000	.500	.500	.000	.000	.000	.625	.000	.625

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Weather: Clear

File Name : 01_UPL_Win_20th PM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 1

Groups Printed- Passenger Vehicles

	Winston Court Southbound			E 20th Street Westbound			E 20th Street Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
04:00 PM	0	1	1	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	1	0	1	1
04:30 PM	0	1	1	0	0	0	1	0	1	2
04:45 PM	0	2	2	0	0	0	1	0	1	3
Total	0	4	4	0	0	0	3	0	3	7
05:00 PM	0	0	0	0	0	0	2	0	2	2
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	2	1	3	3
Total	0	0	0	0	0	0	4	1	5	5
Grand Total	0	4	4	0	0	0	7	1	8	12
Apprch %	0	100		0	0		87.5	12.5		
Total %	0	33.3	33.3	0	0	0	58.3	8.3	66.7	

	Winston Court Southbound			E 20th Street Westbound			E 20th Street Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	0	0	0	0	0	0	1	0	1	1
04:30 PM	0	1	1	0	0	0	1	0	1	2
04:45 PM	0	**2**	**2**	0	0	0	1	0	1	**3**
05:00 PM	0	0	0	0	0	0	**2**	0	**2**	2
Total Volume	0	3	3	0	0	0	5	0	5	8
% App. Total	0	100		0	0		100	0		
PHF	.000	.375	.375	.000	.000	.000	.625	.000	.625	.667

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N/S: Winston Court
E/W: E 20th Street
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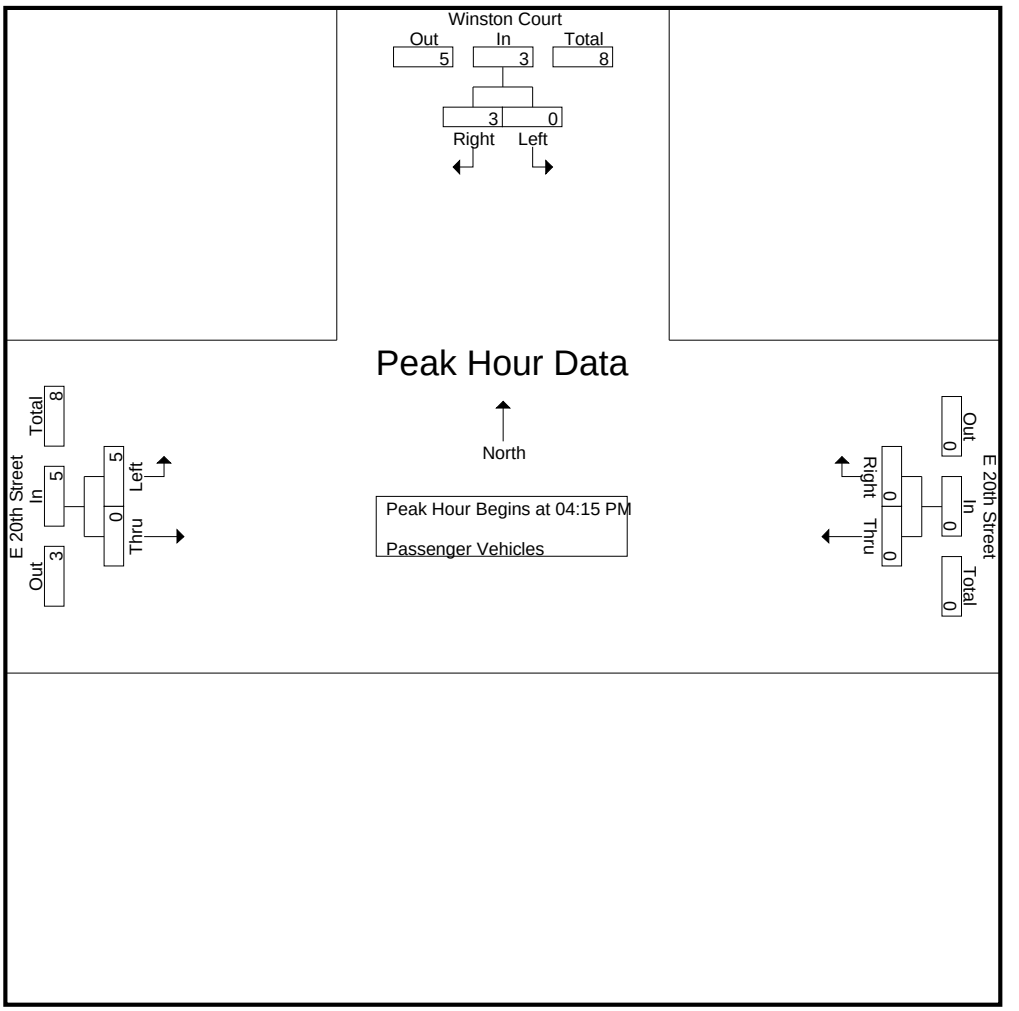
File Name : 01_UPL_Win_20th PM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 2



Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM			04:15 PM			04:15 PM		
+0 mins.	0	0	0	0	0	0	1	0	1
+15 mins.	0	1	1	0	0	0	1	0	1
+30 mins.	0	**2**	**2**	0	0	0	1	0	1
+45 mins.	0	0	0	0	0	0	**2**	0	**2**
Total Volume	0	3	3	0	0	0	5	0	5
% App. Total	0	100		0	0		100	0	
PHF	.000	.375	.375	.000	.000	.000	.625	.000	.625

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N/S: Winston Court
E/W: E 20th Street
Weather: Clear

File Name : 01_UPL_Win_20th PM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

	Winston Court Southbound			E 20th Street Westbound			E 20th Street Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0		0	0		0	0		
Total %										

	Winston Court Southbound			E 20th Street Westbound			E 20th Street Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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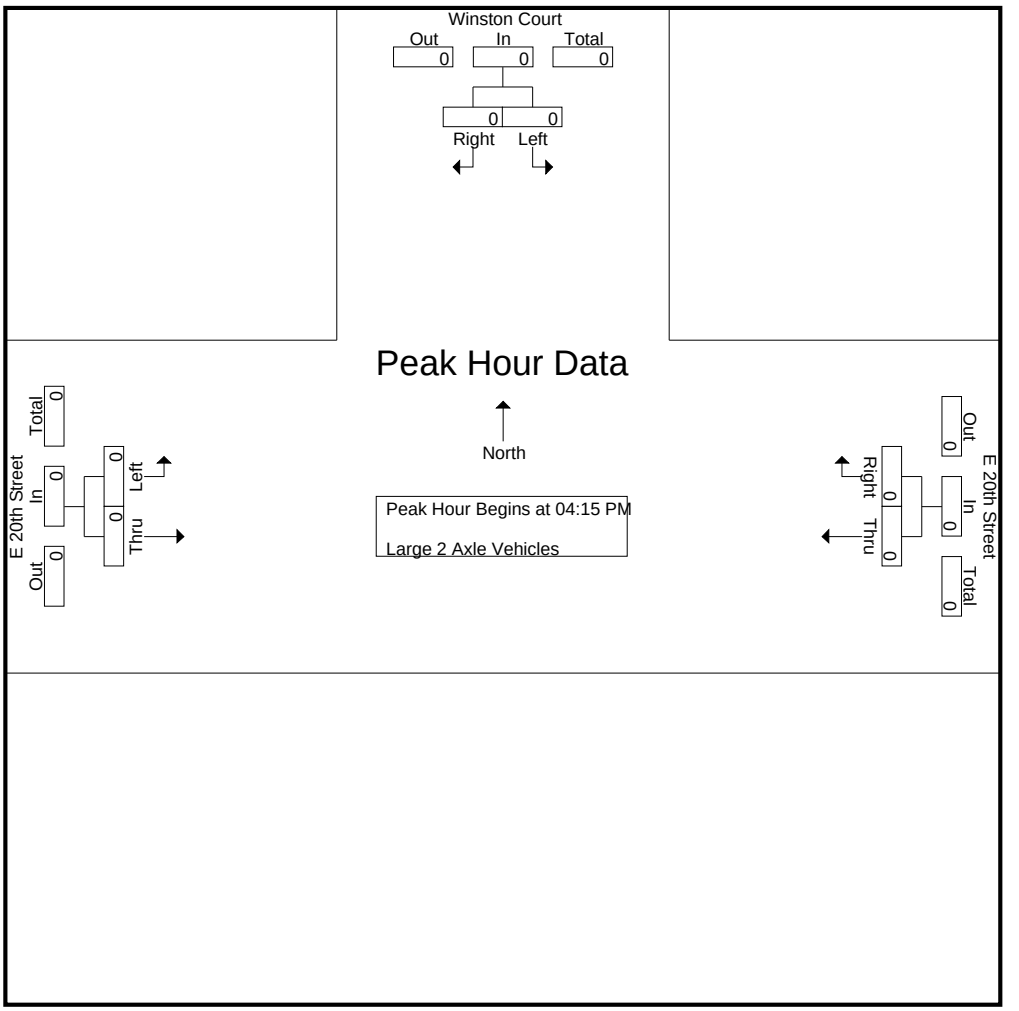
City of Upland
N/S: Winston Court
E/W: E 20th Street
Weather: Clear

File Name : 01_UPL_Win_20th PM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 2



Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM			04:15 PM			04:15 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

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City of Upland
N/S: Winston Court
E/W: E 20th Street
Weather: Clear

File Name : 01_UPL_Win_20th PM
Site Code : 00324879
Start Date : 10/10/2024

Groups Printed- 3 Axle Vehicles

	Winston Court Southbound			E 20th Street Westbound			E 20th Street Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0		0	0		0	0		
Total %										

	Winston Court Southbound			E 20th Street Westbound			E 20th Street Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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City of Upland
N/S: Winston Court
E/W: E 20th Street
Weather: Clear

File Name : 01_UPL_Win_20th PM
Site Code : 00324879
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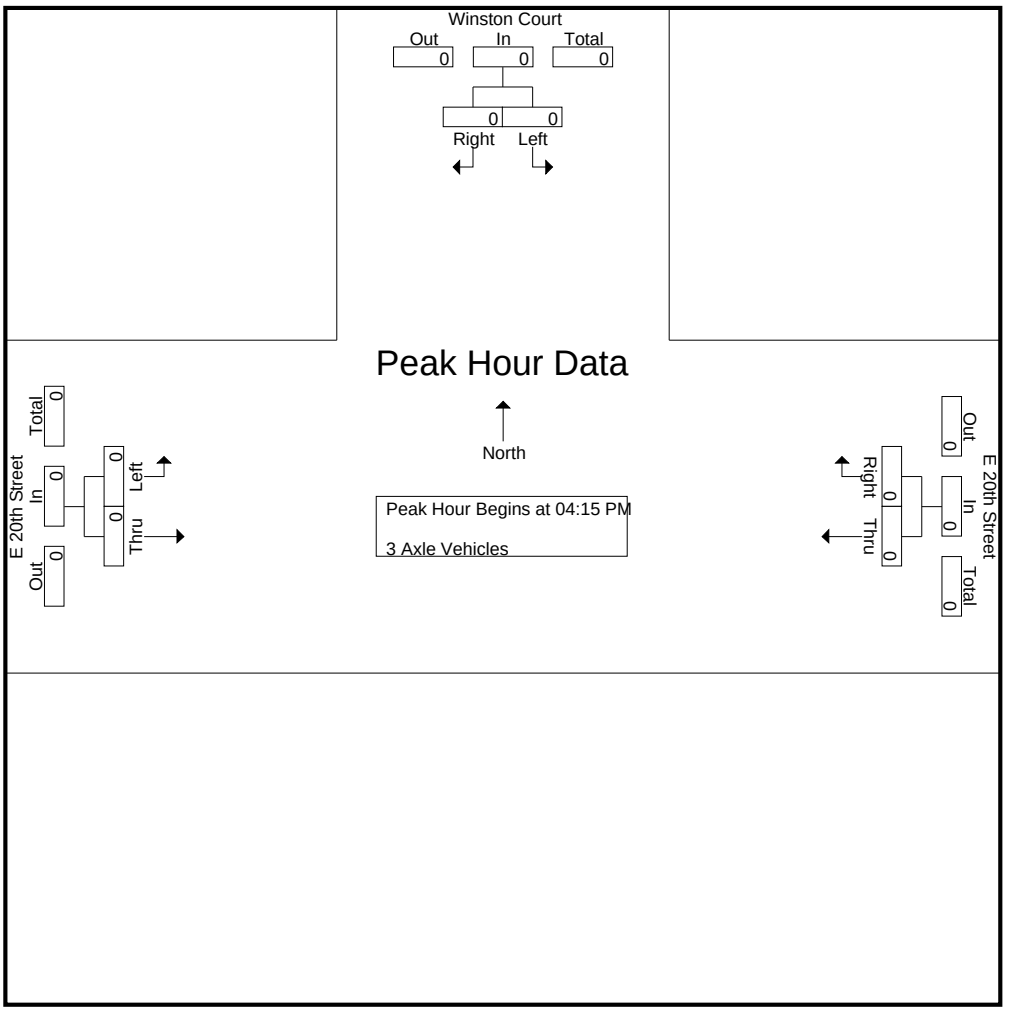
Page No : 2



Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM			04:15 PM			04:15 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

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City of Upland
N/S: Winston Court
E/W: E 20th Street
Weather: Clear

File Name : 01_UPL_Win_20th PM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

	Winston Court Southbound			E 20th Street Westbound			E 20th Street Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0		0	0		0	0		
Total %										

	Winston Court Southbound			E 20th Street Westbound			E 20th Street Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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City of Upland
N/S: Winston Court
E/W: E 20th Street
Weather: Clear

File Name : 01_UPL_Win_20th PM
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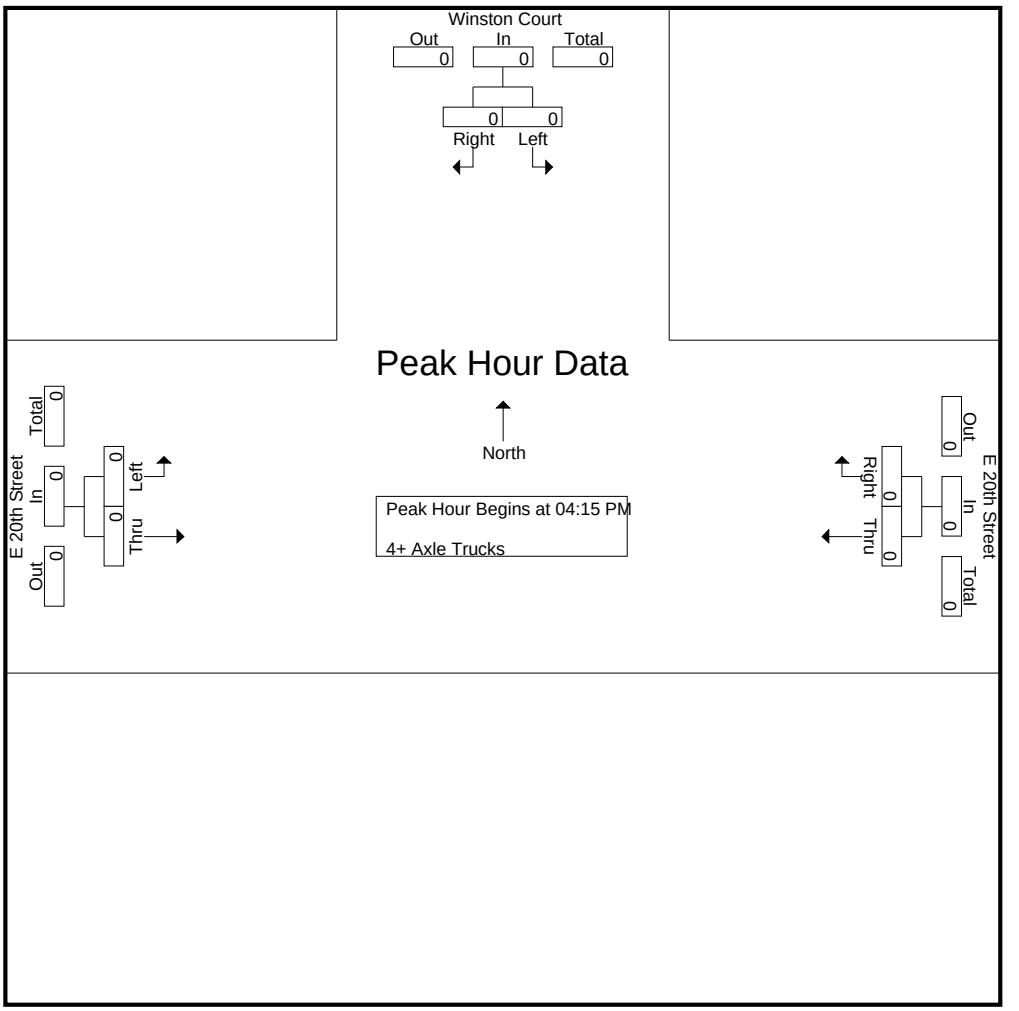
Page No : 2



Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM			04:15 PM			04:15 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

Location: Upland
N/S: Winston Court
E/W: E 20th Street

Date: 10/10/2024
Day: Thursday

PEDESTRIANS

	North Leg Winston Court	East Leg E 20th Street	South Leg Dead End	West Leg E 20th Street	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	2	0	0	0	2
TOTAL VOLUMES:	2	0	0	0	2

	North Leg Winston Court	East Leg E 20th Street	South Leg Dead End	West Leg E 20th Street	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	2	0	0	0	2
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	2	0	0	0	2

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Location: Upland
N/S: Winston Court
E/W: E 20th Street

Date: 10/10/2024
Day: Thursday

BICYCLES

	Southbound Winston Court			Westbound E 20th Street			Northbound Dead End			Eastbound E 20th Street			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	1	0	0	0	0	0	0	1	0	0	2
TOTAL VOLUMES:	0	0	1	0	0	0	0	0	0	1	0	0	2

	Southbound Winston Court			Westbound E 20th Street			Northbound Dead End			Eastbound E 20th Street			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0	0	0	0	0	0	0	0	0

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City of Upland
N/S: N Campus Avenue
E/W: E 20th Street
Weather: Clear

File Name : 02_UPL_Cam_20th AM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

	N Campus Avenue Southbound		E 20th Street Westbound		
Start Time	Left	App. Total	Right	App. Total	Int. Total
07:00 AM	44	44	33	33	77
07:15 AM	49	49	31	31	80
07:30 AM	62	62	42	42	104
07:45 AM	72	72	37	37	109
Total	227	227	143	143	370
08:00 AM	60	60	61	61	121
08:15 AM	48	48	51	51	99
08:30 AM	58	58	38	38	96
08:45 AM	49	49	38	38	87
Total	215	215	188	188	403
Grand Total	442	442	331	331	773
Apprch %	100		100		
Total %	57.2	57.2	42.8	42.8	
Passenger Vehicles	429	429	312	312	741
% Passenger Vehicles	97.1	97.1	94.3	94.3	95.9
Large 2 Axle Vehicles	7	7	16	16	23
% Large 2 Axle Vehicles	1.6	1.6	4.8	4.8	3
3 Axle Vehicles	6	6	3	3	9
% 3 Axle Vehicles	1.4	1.4	0.9	0.9	1.2
4+ Axle Trucks	0	0	0	0	0
% 4+ Axle Trucks	0	0	0	0	0

	N Campus Avenue Southbound		E 20th Street Westbound		
Start Time	Left	App. Total	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1					
Peak Hour for Entire Intersection Begins at 07:30 AM					
07:30 AM	62	62	42	42	104
07:45 AM	**72**	**72**	37	37	109
08:00 AM	60	60	**61**	**61**	**121**
08:15 AM	48	48	51	51	99
Total Volume	242	242	191	191	433
% App. Total	100		100		
PHF	.840	.840	.783	.783	.895

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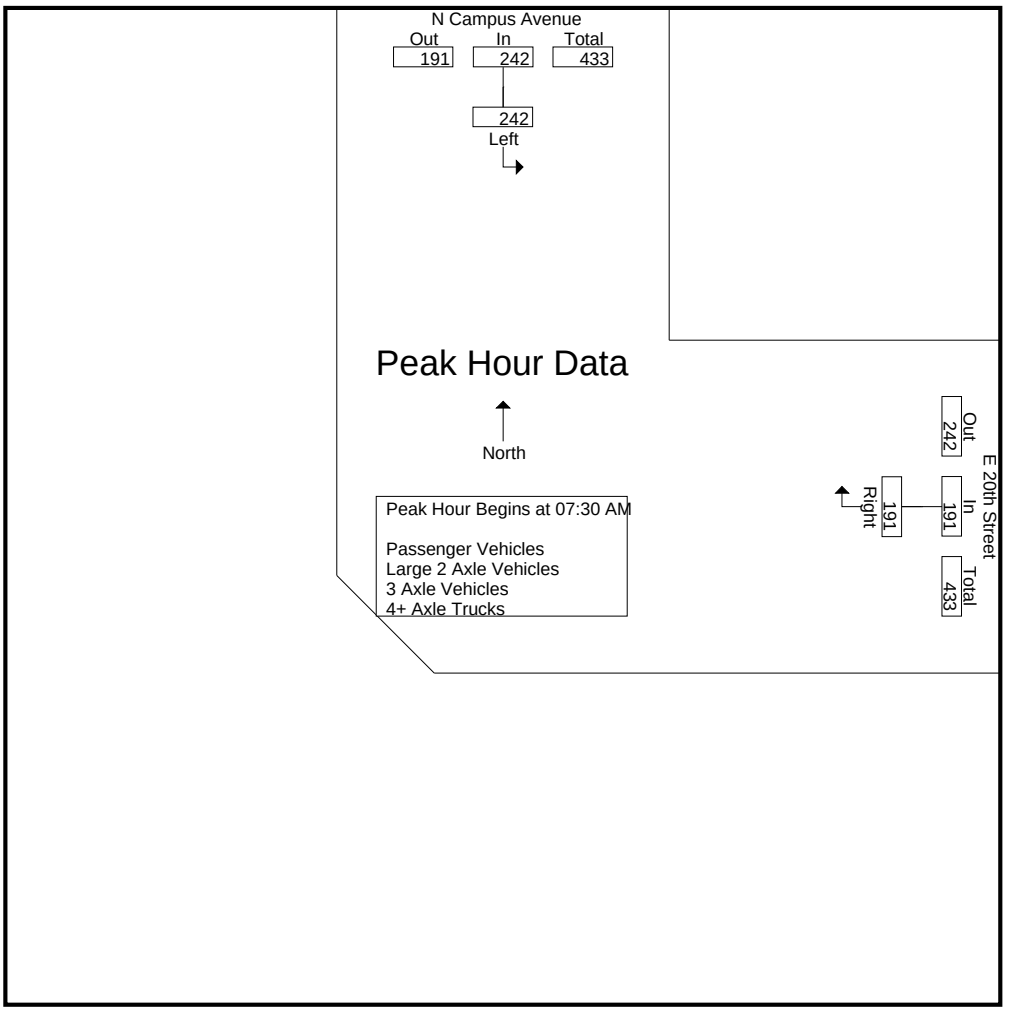
City of Upland
N/S: N Campus Avenue
E/W: E 20th Street
Weather: Clear

File Name : 02_UPL_Cam_20th AM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM		07:30 AM	
+0 mins.	49	49	42	42
+15 mins.	62	62	37	37
+30 mins.	**72**	**72**	**61**	**61**
+45 mins.	60	60	51	51
Total Volume	243	243	191	191
% App. Total	100		100	
PHF	.844	.844	.783	.783

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City of Upland
N/S: N Campus Avenue
E/W: E 20th Street
Weather: Clear

File Name : 02_UPL_Cam_20th AM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 1

Groups Printed- Passenger Vehicles

	N Campus Avenue Southbound		E 20th Street Westbound		
Start Time	Left	App. Total	Right	App. Total	Int. Total
07:00 AM	40	40	31	31	71
07:15 AM	48	48	28	28	76
07:30 AM	62	62	39	39	101
07:45 AM	67	67	35	35	102
Total	217	217	133	133	350
08:00 AM	59	59	59	59	118
08:15 AM	46	46	48	48	94
08:30 AM	58	58	35	35	93
08:45 AM	49	49	37	37	86
Total	212	212	179	179	391
Grand Total	429	429	312	312	741
Apprch %	100		100		
Total %	57.9	57.9	42.1	42.1	

	N Campus Avenue Southbound		E 20th Street Westbound		
Start Time	Left	App. Total	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1					
Peak Hour for Entire Intersection Begins at 07:30 AM					
07:30 AM	62	62	39	39	101
07:45 AM	**67**	**67**	35	35	102
08:00 AM	59	59	**59**	**59**	**118**
08:15 AM	46	46	48	48	94
Total Volume	234	234	181	181	415
% App. Total	100		100		
PHF	.873	.873	.767	.767	.879

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City of Upland
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File Name : 02_UPL_Cam_20th AM
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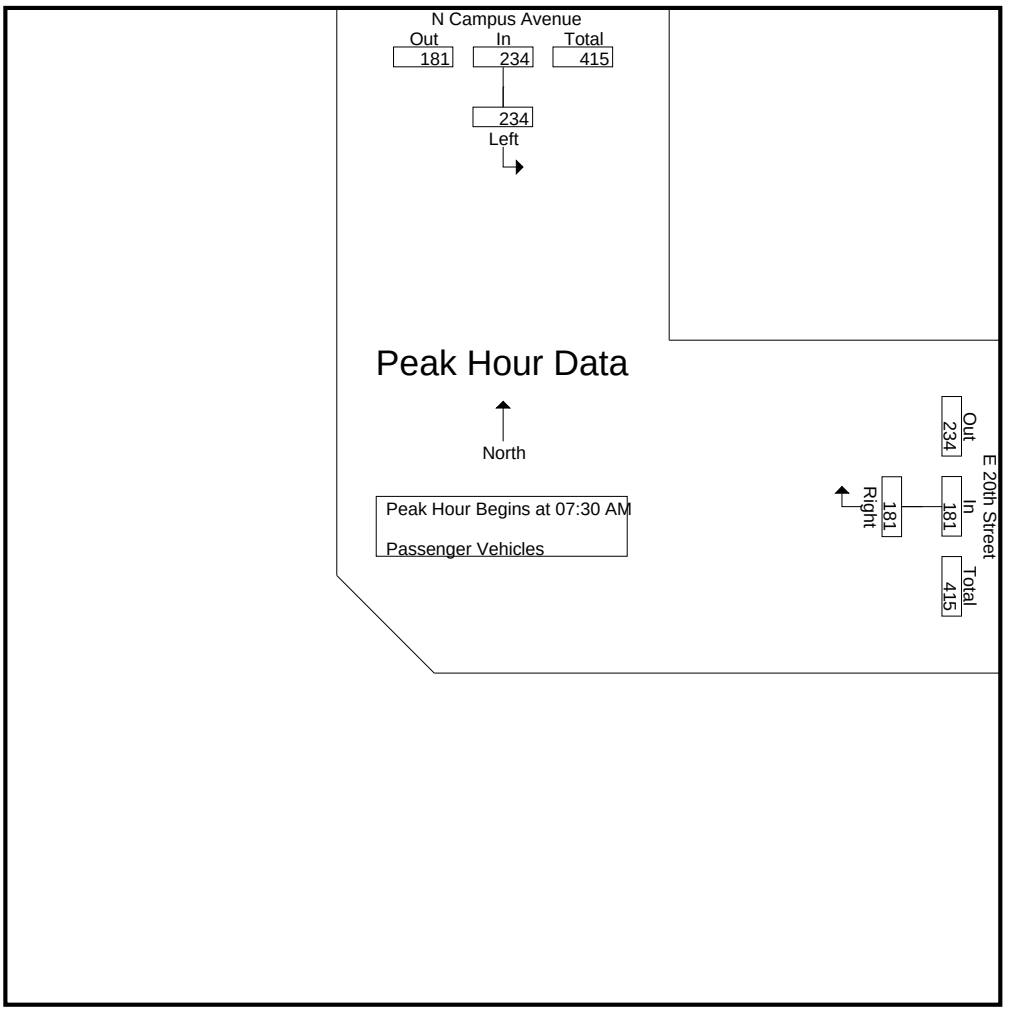
Start Date : 10/10/2024
Page No : 2



Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM		07:30 AM	
+0 mins.	62	62	39	39
+15 mins.	**67**	**67**	35	35
+30 mins.	59	59	**59**	**59**
+45 mins.	46	46	48	48
Total Volume	234	234	181	181
% App. Total	100		100	
PHF	.873	.873	.767	.767

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City of Upland
N/S: N Campus Avenue
E/W: E 20th Street
Weather: Clear

File Name : 02_UPL_Cam_20th AM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

	N Campus Avenue Southbound		E 20th Street Westbound		
Start Time	Left	App. Total	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0
07:15 AM	1	1	3	3	4
07:30 AM	0	0	3	3	3
07:45 AM	3	3	2	2	5
Total	4	4	8	8	12
08:00 AM	1	1	1	1	2
08:15 AM	2	2	3	3	5
08:30 AM	0	0	3	3	3
08:45 AM	0	0	1	1	1
Total	3	3	8	8	11
Grand Total	7	7	16	16	23
Apprch %	100		100		
Total %	30.4	30.4	69.6	69.6	

	N Campus Avenue Southbound		E 20th Street Westbound		
Start Time	Left	App. Total	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1					
Peak Hour for Entire Intersection Begins at 07:30 AM					
07:30 AM	0	0	**3**	**3**	3
07:45 AM	**3**	**3**	2	2	**5**
08:00 AM	1	1	1	1	2
08:15 AM	2	2	3	3	5
Total Volume	6	6	9	9	15
% App. Total	100		100		
PHF	.500	.500	.750	.750	.750

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City of Upland
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File Name : 02_UPL_Cam_20th AM
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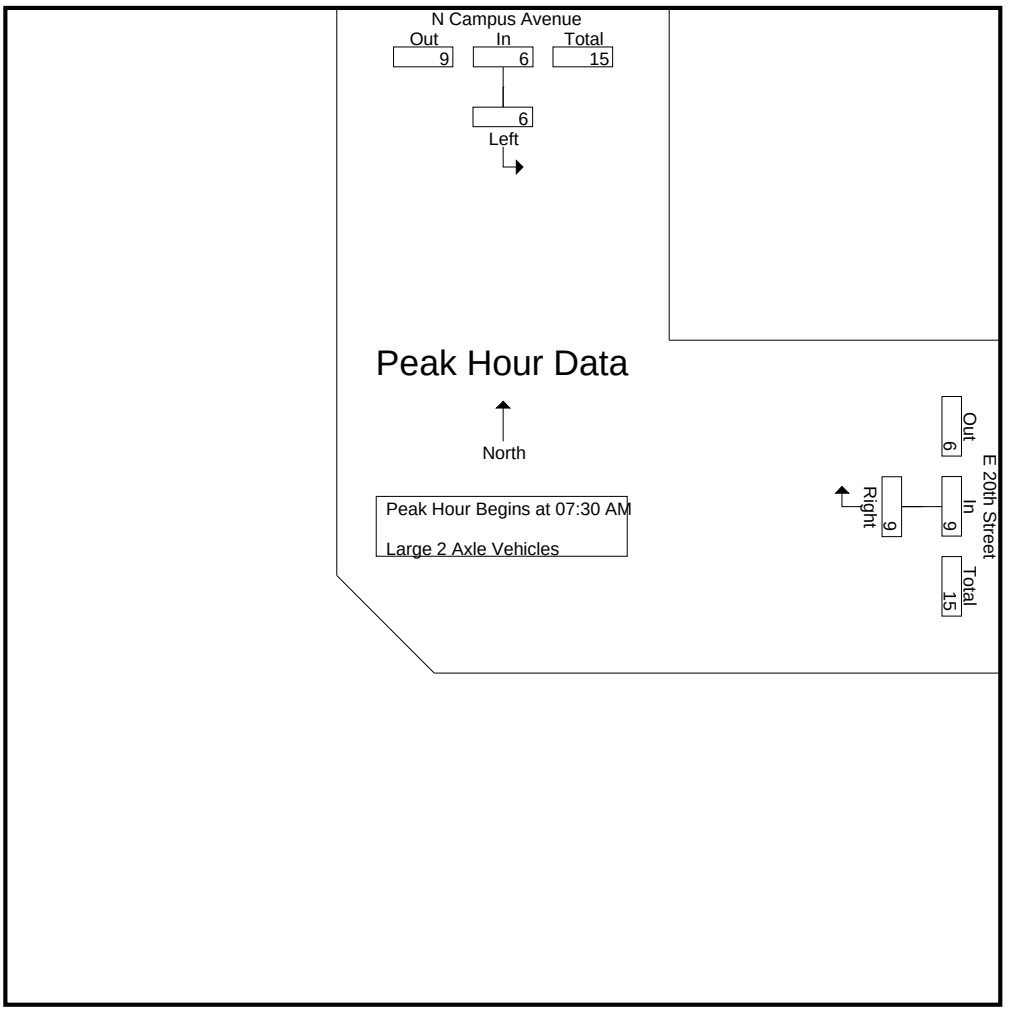

Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM		07:30 AM	
+0 mins.	0	0	**3**	**3**
+15 mins.	**3**	**3**	2	2
+30 mins.	1	1	1	1
+45 mins.	2	2	3	3
Total Volume	6	6	9	9
% App. Total	100		100	
PHF	.500	.500	.750	.750

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City of Upland
N/S: N Campus Avenue
E/W: E 20th Street
Weather: Clear

File Name : 02_UPL_Cam_20th AM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

	N Campus Avenue Southbound		E 20th Street Westbound		
Start Time	Left	App. Total	Right	App. Total	Int. Total
07:00 AM	4	4	2	2	6
07:15 AM	0	0	0	0	0
07:30 AM	0	0	0	0	0
07:45 AM	2	2	0	0	2
Total	6	6	2	2	8
08:00 AM	0	0	1	1	1
08:15 AM	0	0	0	0	0
08:30 AM	0	0	0	0	0
08:45 AM	0	0	0	0	0
Total	0	0	1	1	1
Grand Total	6	6	3	3	9
Apprch %	100		100		
Total %	66.7	66.7	33.3	33.3	

	N Campus Avenue Southbound		E 20th Street Westbound		
Start Time	Left	App. Total	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1					
Peak Hour for Entire Intersection Begins at 07:30 AM					
07:30 AM	0	0	0	0	0
07:45 AM	**2**	**2**	0	0	**2**
08:00 AM	0	0	**1**	**1**	1
08:15 AM	0	0	0	0	0
Total Volume	2	2	1	1	3
% App. Total	100		100		
PHF	.250	.250	.250	.250	.375

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City of Upland
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File Name : 02_UPL_Cam_20th AM
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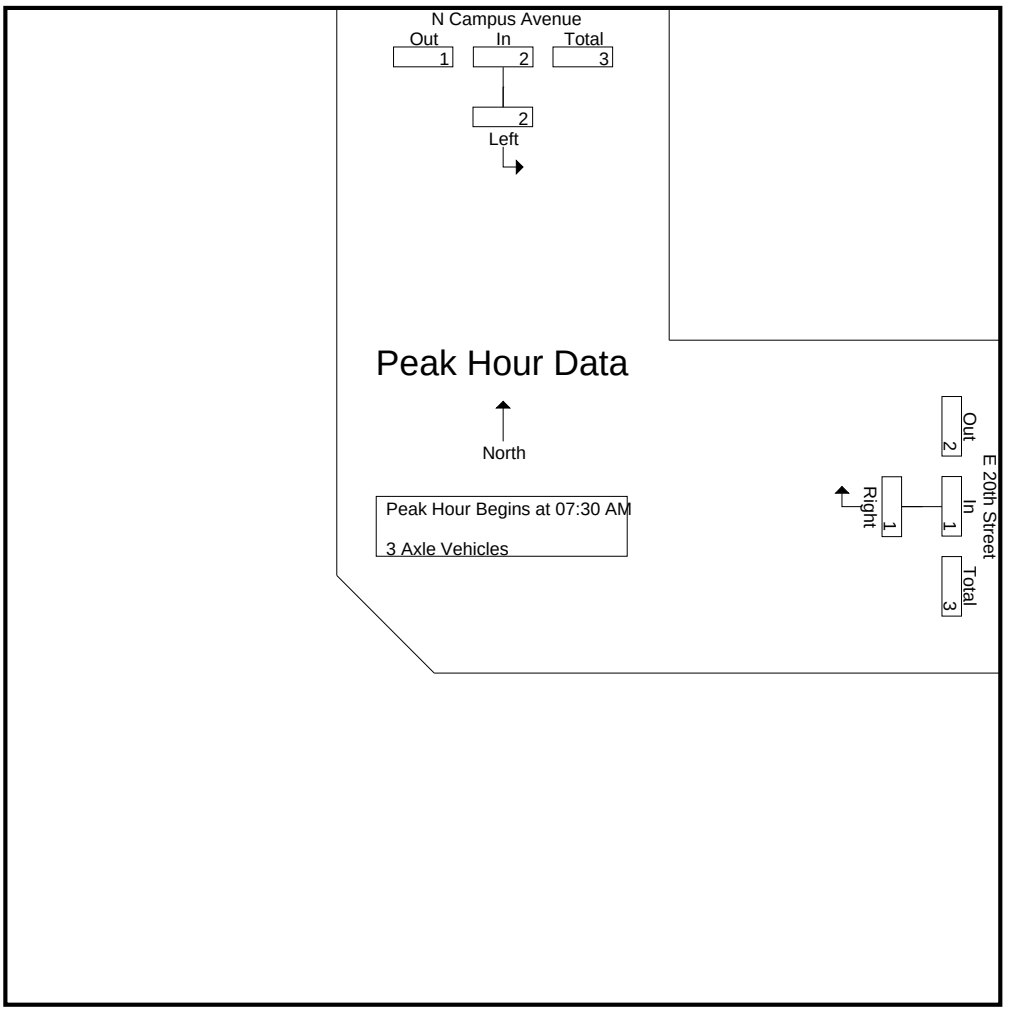
Page No : 2



Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM		07:30 AM	
+0 mins.	0	0	0	0
+15 mins.	**2**	**2**	0	0
+30 mins.	0	0	**1**	**1**
+45 mins.	0	0	0	0
Total Volume	2	2	1	1
% App. Total	100		100	
PHF	.250	.250	.250	.250

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City of Upland
N/S: N Campus Avenue
E/W: E 20th Street
Weather: Clear

File Name : 02_UPL_Cam_20th AM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

	N Campus Avenue Southbound		E 20th Street Westbound		
Start Time	Left	App. Total	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0
07:15 AM	0	0	0	0	0
07:30 AM	0	0	0	0	0
07:45 AM	0	0	0	0	0
Total	0	0	0	0	0
08:00 AM	0	0	0	0	0
08:15 AM	0	0	0	0	0
08:30 AM	0	0	0	0	0
08:45 AM	0	0	0	0	0
Total	0	0	0	0	0
Grand Total	0	0	0	0	0
Apprch %	0		0		
Total %					

	N Campus Avenue Southbound		E 20th Street Westbound		
Start Time	Left	App. Total	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1					
Peak Hour for Entire Intersection Begins at 07:30 AM					
07:30 AM	0	0	0	0	0
07:45 AM	0	0	0	0	0
08:00 AM	0	0	0	0	0
08:15 AM	0	0	0	0	0
Total Volume	0	0	0	0	0
% App. Total	0		0		
PHF	.000	.000	.000	.000	.000

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City of Upland
N/S: N Campus Avenue
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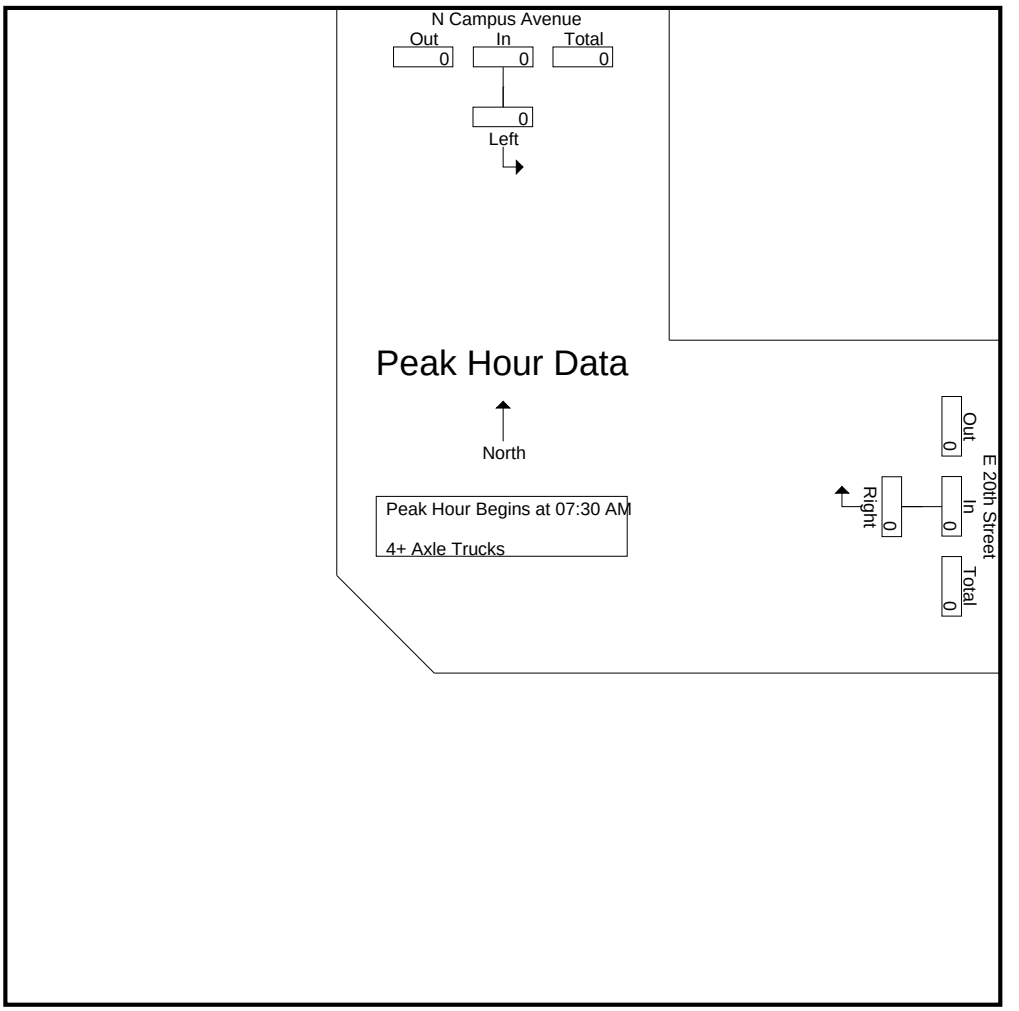
File Name : 02_UPL_Cam_20th AM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 2



Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM		07:30 AM	
+0 mins.	0	0	0	0
+15 mins.	0	0	0	0
+30 mins.	0	0	0	0
+45 mins.	0	0	0	0
Total Volume	0	0	0	0
% App. Total	0		0	
PHF	.000	.000	.000	.000

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City of Upland
N/S: N Campus Avenue
E/W: E 20th Street
Weather: Clear

File Name : 02_UPL_Cam_20th PM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

	N Campus Avenue Southbound		E 20th Street Westbound		
Start Time	Left	App. Total	Right	App. Total	Int. Total
04:00 PM	130	130	52	52	182
04:15 PM	128	128	67	67	195
04:30 PM	143	143	58	58	201
04:45 PM	134	134	69	69	203
Total	535	535	246	246	781
05:00 PM	143	143	41	41	184
05:15 PM	127	127	70	70	197
05:30 PM	120	120	53	53	173
05:45 PM	113	113	51	51	164
Total	503	503	215	215	718
Grand Total	1038	1038	461	461	1499
Apprch %	100		100		
Total %	69.2	69.2	30.8	30.8	
Passenger Vehicles	1025	1025	456	456	1481
% Passenger Vehicles	98.7	98.7	98.9	98.9	98.8
Large 2 Axle Vehicles	13	13	5	5	18
% Large 2 Axle Vehicles	1.3	1.3	1.1	1.1	1.2
3 Axle Vehicles	0	0	0	0	0
% 3 Axle Vehicles	0	0	0	0	0
4+ Axle Trucks	0	0	0	0	0
% 4+ Axle Trucks	0	0	0	0	0

	N Campus Avenue Southbound		E 20th Street Westbound		
Start Time	Left	App. Total	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1					
Peak Hour for Entire Intersection Begins at 04:30 PM					
04:30 PM	**143**	**143**	58	58	201
04:45 PM	134	134	69	69	**203**
05:00 PM	143	143	41	41	184
05:15 PM	127	127	**70**	**70**	197
Total Volume	547	547	238	238	785
% App. Total	100		100		
PHF	.956	.956	.850	.850	.967

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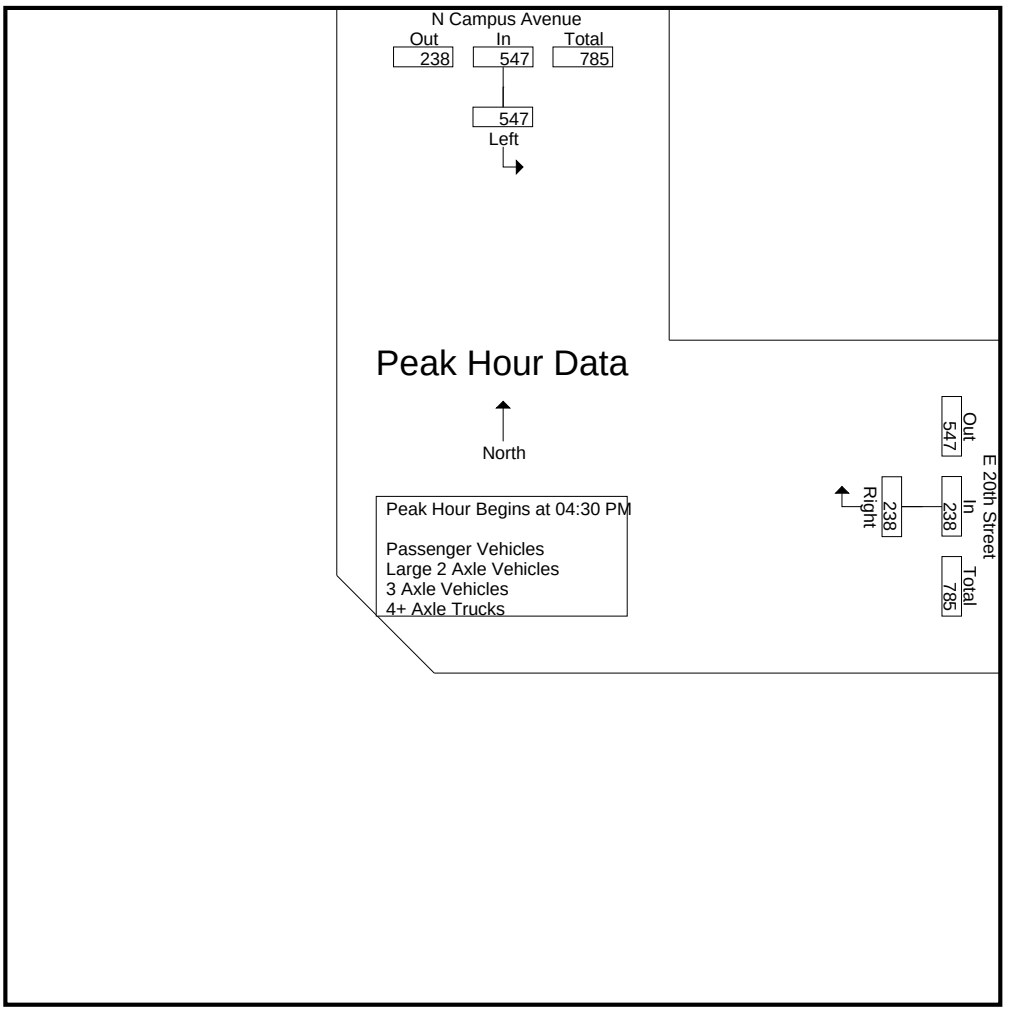
File Name : 02_UPL_Cam_20th PM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM		04:00 PM	
+0 mins.	128	128	52	52
+15 mins.	**143**	**143**	67	67
+30 mins.	134	134	58	58
+45 mins.	143	143	**69**	**69**
Total Volume	548	548	246	246
% App. Total	100		100	
PHF	.958	.958	.891	.891

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City of Upland
N/S: N Campus Avenue
E/W: E 20th Street
Weather: Clear

File Name : 02_UPL_Cam_20th PM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 1

Groups Printed- Passenger Vehicles

	N Campus Avenue Southbound		E 20th Street Westbound		
Start Time	Left	App. Total	Right	App. Total	Int. Total
04:00 PM	128	128	51	51	179
04:15 PM	125	125	66	66	191
04:30 PM	140	140	58	58	198
04:45 PM	131	131	68	68	199
Total	524	524	243	243	767
05:00 PM	143	143	40	40	183
05:15 PM	126	126	69	69	195
05:30 PM	119	119	53	53	172
05:45 PM	113	113	51	51	164
Total	501	501	213	213	714
Grand Total	1025	1025	456	456	1481
Apprch %	100		100		
Total %	69.2	69.2	30.8	30.8	

	N Campus Avenue Southbound		E 20th Street Westbound		
Start Time	Left	App. Total	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1					
Peak Hour for Entire Intersection Begins at 04:30 PM					
04:30 PM	140	140	58	58	198
04:45 PM	131	131	68	68	**199**
05:00 PM	**143**	**143**	40	40	183
05:15 PM	126	126	**69**	**69**	195
Total Volume	540	540	235	235	775
% App. Total	100		100		
PHF	.944	.944	.851	.851	.974

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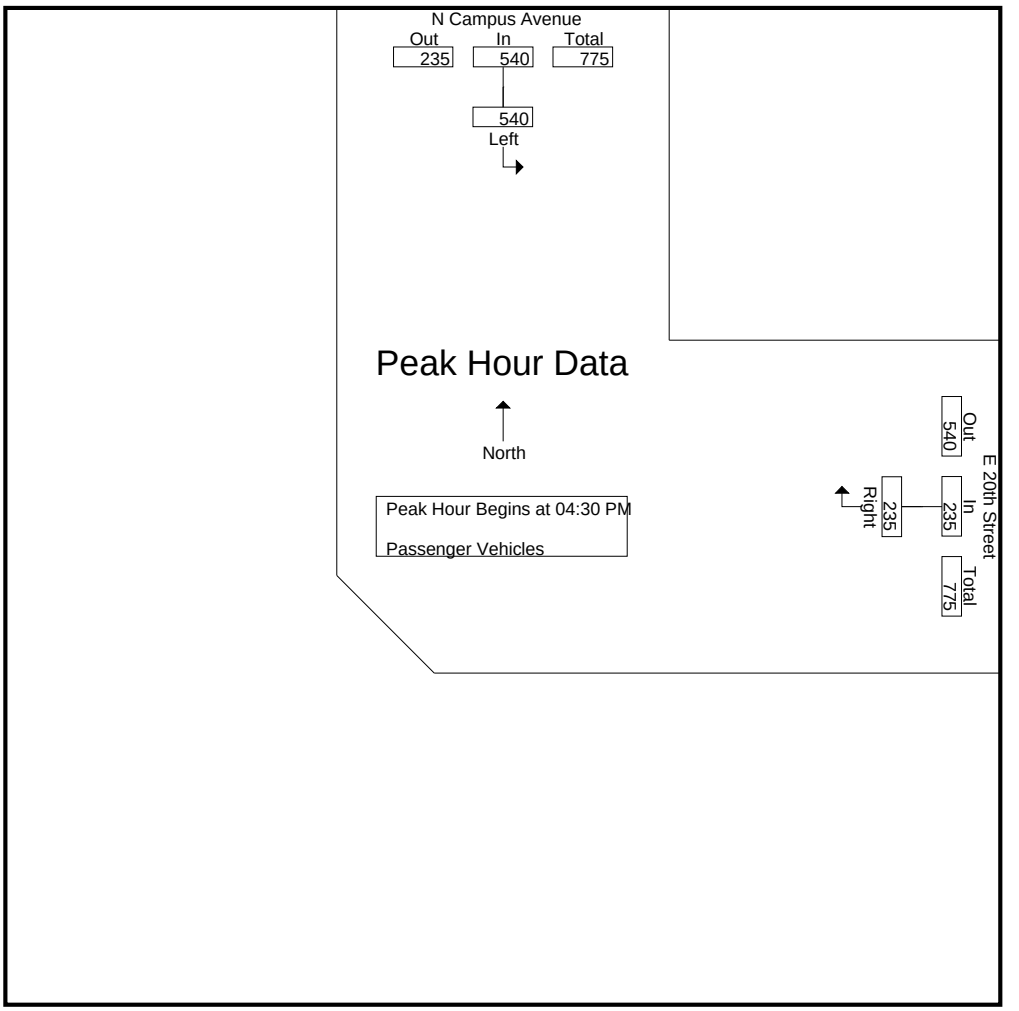
City of Upland
N/S: N Campus Avenue
E/W: E 20th Street
Weather: Clear

File Name : 02_UPL_Cam_20th PM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 2



Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM		04:30 PM	
+0 mins.	140	140	58	58
+15 mins.	131	131	68	68
+30 mins.	**143**	**143**	40	40
+45 mins.	126	126	**69**	**69**
Total Volume	540	540	235	235
% App. Total	100		100	
PHF	.944	.944	.851	.851

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City of Upland
N/S: N Campus Avenue
E/W: E 20th Street
Weather: Clear

File Name : 02_UPL_Cam_20th PM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

	N Campus Avenue Southbound		E 20th Street Westbound		
Start Time	Left	App. Total	Right	App. Total	Int. Total
04:00 PM	2	2	1	1	3
04:15 PM	3	3	1	1	4
04:30 PM	3	3	0	0	3
04:45 PM	3	3	1	1	4
Total	11	11	3	3	14
05:00 PM	0	0	1	1	1
05:15 PM	1	1	1	1	2
05:30 PM	1	1	0	0	1
05:45 PM	0	0	0	0	0
Total	2	2	2	2	4
Grand Total	13	13	5	5	18
Apprch %	100		100		
Total %	72.2	72.2	27.8	27.8	

	N Campus Avenue Southbound		E 20th Street Westbound		
Start Time	Left	App. Total	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1					
Peak Hour for Entire Intersection Begins at 04:30 PM					
04:30 PM	**3**	**3**	0	0	3
04:45 PM	3	3	**1**	**1**	**4**
05:00 PM	0	0	1	1	1
05:15 PM	1	1	1	1	2
Total Volume	7	7	3	3	10
% App. Total	100		100		
PHF	.583	.583	.750	.750	.625

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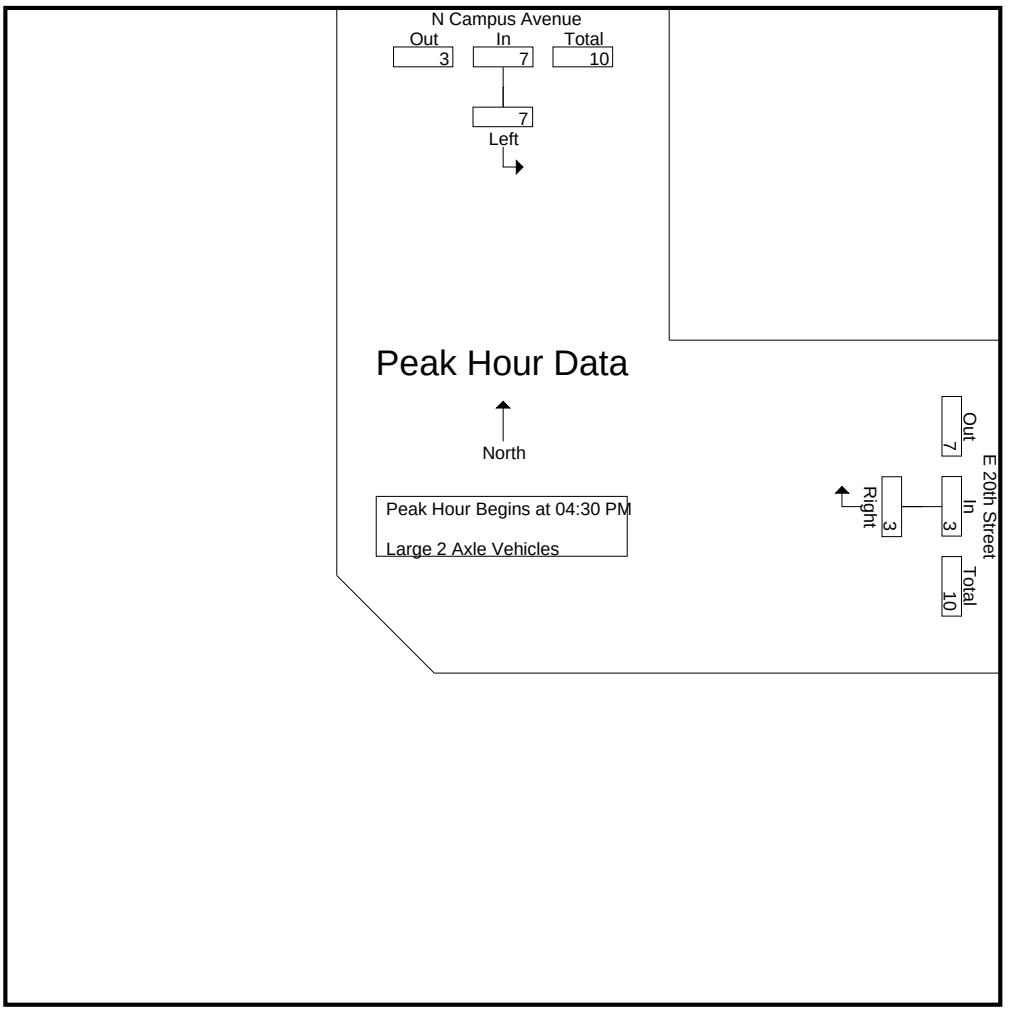
File Name : 02_UPL_Cam_20th PM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 2



Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM		04:30 PM	
+0 mins.	**3**	**3**	0	0
+15 mins.	3	3	**1**	**1**
+30 mins.	0	0	1	1
+45 mins.	1	1	1	1
Total Volume	7	7	3	3
% App. Total	100		100	
PHF	.583	.583	.750	.750

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E/W: E 20th Street
Weather: Clear

File Name : 02_UPL_Cam_20th PM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

	N Campus Avenue Southbound		E 20th Street Westbound		
Start Time	Left	App. Total	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0
04:15 PM	0	0	0	0	0
04:30 PM	0	0	0	0	0
04:45 PM	0	0	0	0	0
Total	0	0	0	0	0
05:00 PM	0	0	0	0	0
05:15 PM	0	0	0	0	0
05:30 PM	0	0	0	0	0
05:45 PM	0	0	0	0	0
Total	0	0	0	0	0
Grand Total	0	0	0	0	0
Apprch %	0		0		
Total %					

	N Campus Avenue Southbound		E 20th Street Westbound		
Start Time	Left	App. Total	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1					
Peak Hour for Entire Intersection Begins at 04:30 PM					
04:30 PM	0	0	0	0	0
04:45 PM	0	0	0	0	0
05:00 PM	0	0	0	0	0
05:15 PM	0	0	0	0	0
Total Volume	0	0	0	0	0
% App. Total	0		0		
PHF	.000	.000	.000	.000	.000

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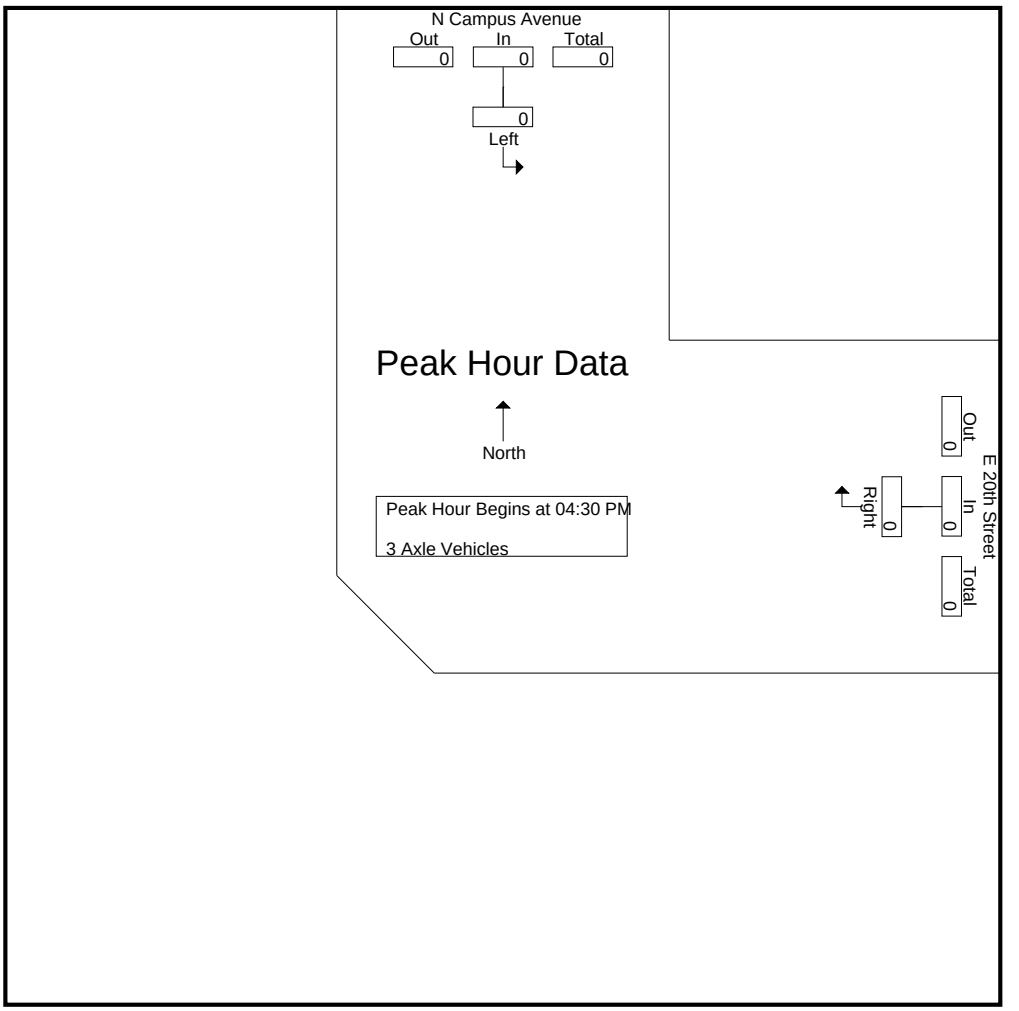
N/S: N Campus Avenue
E/W: E 20th Street
Weather: Clear

File Name : 02_UPL_Cam_20th PM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 2



Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM		04:30 PM	
+0 mins.	0	0	0	0
+15 mins.	0	0	0	0
+30 mins.	0	0	0	0
+45 mins.	0	0	0	0
Total Volume	0	0	0	0
% App. Total	0		0	
PHF	.000	.000	.000	.000

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City of Upland
N/S: N Campus Avenue
E/W: E 20th Street
Weather: Clear

File Name : 02_UPL_Cam_20th PM
Site Code : 00324879
Start Date : 10/10/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

	N Campus Avenue Southbound		E 20th Street Westbound		
Start Time	Left	App. Total	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0
04:15 PM	0	0	0	0	0
04:30 PM	0	0	0	0	0
04:45 PM	0	0	0	0	0
Total	0	0	0	0	0
05:00 PM	0	0	0	0	0
05:15 PM	0	0	0	0	0
05:30 PM	0	0	0	0	0
05:45 PM	0	0	0	0	0
Total	0	0	0	0	0
Grand Total	0	0	0	0	0
Apprch %	0		0		
Total %					

	N Campus Avenue Southbound		E 20th Street Westbound		
Start Time	Left	App. Total	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1					
Peak Hour for Entire Intersection Begins at 04:30 PM					
04:30 PM	0	0	0	0	0
04:45 PM	0	0	0	0	0
05:00 PM	0	0	0	0	0
05:15 PM	0	0	0	0	0
Total Volume	0	0	0	0	0
% App. Total	0		0		
PHF	.000	.000	.000	.000	.000

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City of Upland
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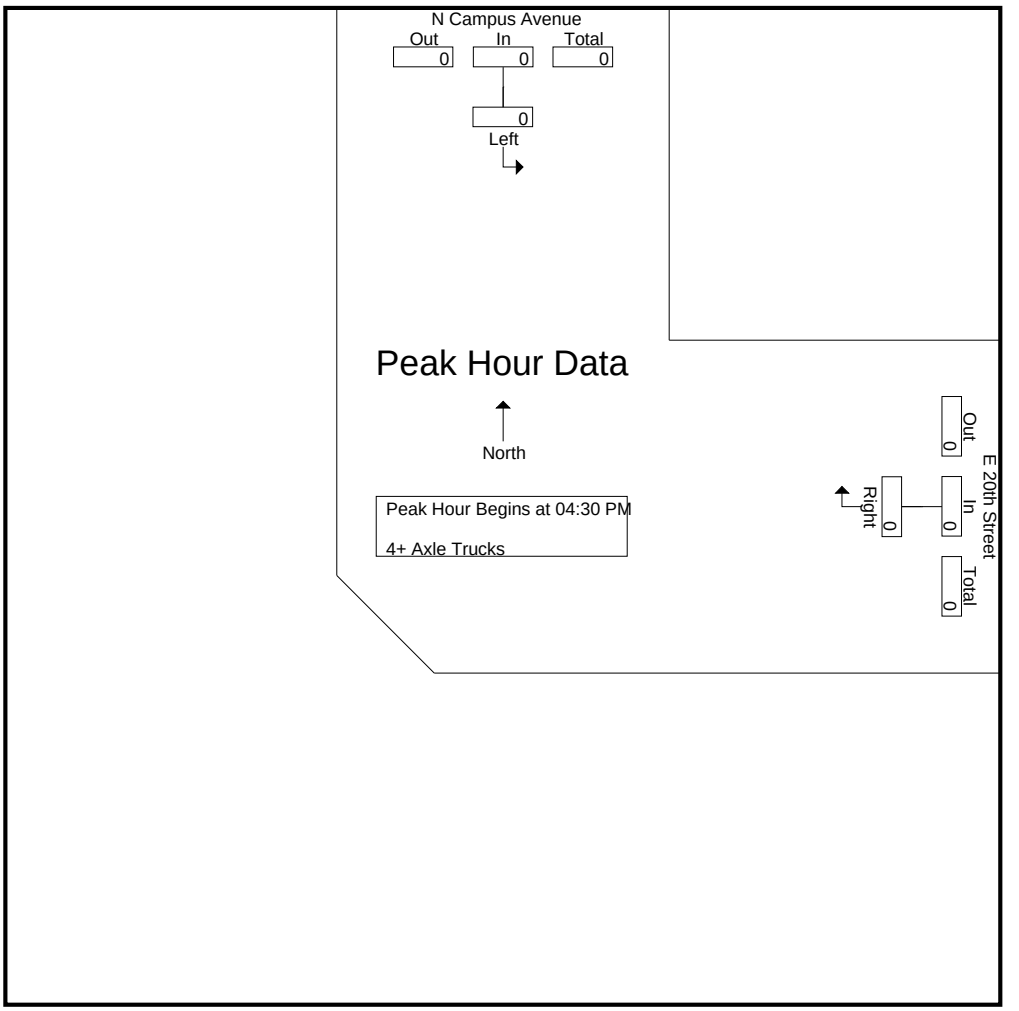
Start Date : 10/10/2024
Page No : 2



Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM		04:30 PM	
+0 mins.	0	0	0	0
+15 mins.	0	0	0	0
+30 mins.	0	0	0	0
+45 mins.	0	0	0	0
Total Volume	0	0	0	0
% App. Total	0		0	
PHF	.000	.000	.000	.000

Location: Upland
N/S: N Campus Avenue
E/W: E 20th Street

Date: 10/10/2024
Day: Thursday

PEDESTRIANS

	North Leg N Campus Avenue	East Leg E 20th Street	South Leg Dead End	West Leg Dead End	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	2	2
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	2	2

	North Leg N Campus Avenue	East Leg E 20th Street	South Leg Dead End	West Leg Dead End	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

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Location: Upland
N/S: N Campus Avenue
E/W: E 20th Street

Date: 10/10/2024
Day: Thursday

BICYCLES

	Southbound N Campus Avenue			Westbound E 20th Street			Northbound Dead End			Eastbound Dead End			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	1
7:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	1
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	6	0	0	0	0	0	0	0	0	0	0	0	6
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	6	0	0	0	0	2	0	0	0	0	0	0	8

	Southbound N Campus Avenue			Westbound E 20th Street			Northbound Dead End			Eastbound Dead End			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4:00 PM	1	0	0	0	0	0	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	1	0	0	0	0	0	0	0	0	0	0	0	1
TOTAL VOLUMES:	2	0	0	0	0	0	0	0	0	0	0	0	2

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APPENDIX C

VOLUME DEVELOPMENT WORKSHEETS

LSA

Table C-1 - Existing Peak Hour PCE Volume Summary

		A.M. Peak Hour	P.M. Peak Hour
		Existing w/o Project	Existing w/o Project
1	**Winston Court - Project Driveway 1/20th Street**		
NBL		0	0
NBT		0	0
NBR		0	0
SBL		0	0
SBT		0	0
SBR		5	3
EBL		2	5
EBT		4	0
EBR		0	0
WBL		0	0
WBT		4	0
WBR		2	0
North Leg			
	Approach	5	3
	Departure	4	5
	Total	9	8
South Leg			
	Approach	0	0
	Departure	0	0
	Total	0	0
East Leg			
	Approach	6	0
	Departure	4	0
	Total	10	0
West Leg			
	Approach	6	5
	Departure	9	3
	Total	15	8
Total Approaches			
	Approach	17	8
	Departure	17	8
	Total	34	16

LSA

Table C-1 - Existing Peak Hour PCE Volume Summary

		A.M. Peak Hour	P.M. Peak Hour
		Existing w/o Project	Existing w/o Project
2	**Project Driveway 2/20th Street**		
NBL		0	0
NBT		0	0
NBR		0	0
SBL		0	0
SBT		0	0
SBR		0	0
EBL		0	0
EBT		4	0
EBR		0	0
WBL		0	0
WBT		6	0
WBR		0	0
North Leg			
	Approach	0	0
	Departure	0	0
	Total	0	0
South Leg			
	Approach	0	0
	Departure	0	0
	Total	0	0
East Leg			
	Approach	6	0
	Departure	4	0
	Total	10	0
West Leg			
	Approach	4	0
	Departure	6	0
	Total	10	0
Total Approaches			
	Approach	10	0
	Departure	10	0
	Total	20	0

LSA

Table C-1 - Existing Peak Hour PCE Volume Summary

		A.M. Peak Hour	P.M. Peak Hour
		Existing w/o Project	Existing w/o Project
3	**Campus Avenue/Project Driveway 3 - 20th Street**		
NBL		0	0
NBT		0	0
NBR		0	0
SBL		247	551
SBT		0	0
SBR		0	0
EBL		0	0
EBT		0	0
EBR		0	0
WBL		0	0
WBT		0	0
WBR		197	240
North Leg			
	Approach	247	551
	Departure	197	240
	Total	444	791
South Leg			
	Approach	0	0
	Departure	0	0
	Total	0	0
East Leg			
	Approach	197	240
	Departure	247	551
	Total	444	791
West Leg			
	Approach	0	0
	Departure	0	0
	Total	0	0
Total Approaches			
	Approach	444	791
	Departure	444	791
	Total	888	1,582

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Table C-2 - Opening Year (2027) Peak Hour PCE Volume Summary

	AM Peak Hour						PM Peak Hour					
	Existing w/o Project Volumes	2024 to 2027 Growth	Approved and Pending Project Trips	OY (2027) w/o Project Volumes	Project Trips	OY (2027) w/ Project Volumes	Existing w/o Project Volumes	2024 to 2027 Growth	Approved and Pending Project Trips	OY (2027) w/o Project Volumes	Project Trips	OY (2027) w/ Project Volumes
1 Winston Court - Project Driveway 1/20th Street												
NBL	0	0	0	0	1	1	0	0	0	0	5	5
NBT	0	0	0	0	0	0	0	0	0	0	0	0
NBR	0	0	0	0	0	0	0	0	0	0	0	0
SBL	0	0	0	0	0	0	0	0	0	0	0	0
SBT	0	0	0	0	0	0	0	0	0	0	0	0
SBR	5	0	1	6	0	6	3	0	1	4	0	4
EBL	2	0	1	3	0	3	5	0	1	6	0	6
EBT	4	0	0	4	3	7	0	0	0	0	0	0
EBR	0	0	0	0	5	5	0	0	0	0	3	3
WBL	0	0	0	0	0	0	0	0	0	0	0	0
WBT	4	0	0	4	0	4	0	0	0	0	3	3
WBR	2	0	0	2	0	2	0	0	0	0	0	0
North Leg												
Approach	5	0	1	6	0	6	3	0	1	4	0	4
Departure	4	0	1	5	0	5	5	0	1	6	0	6
Total	9	0	2	11	0	11	8	0	2	10	0	10
South Leg												
Approach	0	0	0	0	1	1	0	0	0	0	5	5
Departure	0	0	0	0	5	5	0	0	0	0	3	3
Total	0	0	0	0	6	6	0	0	0	0	8	8
East Leg												
Approach	6	0	0	6	0	6	0	0	0	0	3	3
Departure	4	0	0	4	3	7	0	0	0	0	0	0
Total	10	0	0	10	3	13	0	0	0	0	3	3
West Leg												
Approach	6	0	1	7	8	15	5	0	1	6	3	9
Departure	9	0	1	10	1	11	3	0	1	4	8	12
Total	15	0	2	17	9	26	8	0	2	10	11	21
Total Approaches												
Approach	17	0	2	19	9	28	8	0	2	10	11	21
Departure	17	0	2	19	9	28	8	0	2	10	11	21
Total	34	0	4	38	18	56	16	0	4	20	22	42

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Table C-2 - Opening Year (2027) Peak Hour PCE Volume Summary

	AM Peak Hour						PM Peak Hour					
	Existing w/o Project Volumes	2024 to 2027 Growth	Approved and Pending Project Trips	OY (2027) w/o Project Volumes	Project Trips	OY (2027) w/ Project Volumes	Existing w/o Project Volumes	2024 to 2027 Growth	Approved and Pending Project Trips	OY (2027) w/o Project Volumes	Project Trips	OY (2027) w/ Project Volumes
2 Project Driveway 2/20th Street												
NBL	0	0	0	0	0	0	0	0	0	0	3	3
NBT	0	0	0	0	0	0	0	0	0	0	0	0
NBR	0	0	0	0	0	0	0	0	0	0	0	0
SBL	0	0	0	0	0	0	0	0	0	0	0	0
SBT	0	0	0	0	0	0	0	0	0	0	0	0
SBR	0	0	0	0	0	0	0	0	0	0	0	0
EBL	0	0	0	0	0	0	0	0	0	0	0	0
EBT	4	0	0	4	0	4	0	0	0	0	0	0
EBR	0	0	0	0	3	3	0	0	0	0	0	0
WBL	0	0	0	0	0	0	0	0	0	0	0	0
WBT	6	0	0	6	0	6	0	0	0	0	0	0
WBR	0	0	0	0	0	0	0	0	0	0	0	0
North Leg												
Approach	0	0	0	0	0	0	0	0	0	0	0	0
Departure	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
South Leg												
Approach	0	0	0	0	0	0	0	0	0	0	3	3
Departure	0	0	0	0	3	3	0	0	0	0	0	0
Total	0	0	0	0	3	3	0	0	0	0	3	3
East Leg												
Approach	6	0	0	6	0	6	0	0	0	0	0	0
Departure	4	0	0	4	0	4	0	0	0	0	0	0
Total	10	0	0	10	0	10	0	0	0	0	0	0
West Leg												
Approach	4	0	0	4	3	7	0	0	0	0	0	0
Departure	6	0	0	6	0	6	0	0	0	0	3	3
Total	10	0	0	10	3	13	0	0	0	0	3	3
Total Approaches												
Approach	10	0	0	10	3	13	0	0	0	0	3	3
Departure	10	0	0	10	3	13	0	0	0	0	3	3
Total	20	0	0	20	6	26	0	0	0	0	6	6

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Table C-2 - Opening Year (2027) Peak Hour PCE Volume Summary

	AM Peak Hour						PM Peak Hour					
	Existing w/o Project Volumes	2024 to 2027 Growth	Approved and Pending Project Trips	OY (2027) w/o Project Volumes	Project Trips	OY (2027) w/ Project Volumes	Existing w/o Project Volumes	2024 to 2027 Growth	Approved and Pending Project Trips	OY (2027) w/o Project Volumes	Project Trips	OY (2027) w/ Project Volumes
3 Campus Avenue/Project Driveway 3 - 20th Street												
NBL	0	0	0	0	0	0	0	0	0	0	0	0
NBT	0	0	1	1	0	1	0	0	3	3	0	3
NBR	0	0	2	2	0	2	0	0	5	5	0	5
SBL	247	15	3	265	0	265	551	33	6	590	0	590
SBT	0	0	2	2	0	2	0	0	3	3	0	3
SBR	0	0	0	0	0	0	0	0	0	0	0	0
EBL	0	0	0	0	0	0	0	0	0	0	0	0
EBT	0	0	0	0	9	9	0	0	0	0	7	7
EBR	0	0	0	0	0	0	0	0	0	0	0	0
WBL	0	0	3	3	0	3	0	0	4	4	0	4
WBT	0	0	0	0	7	7	0	0	0	0	9	9
WBR	197	12	5	214	0	214	240	14	4	258	0	258
North Leg												
Approach	247	15	5	267	0	267	551	33	9	593	0	593
Departure	197	12	6	215	0	215	240	14	7	261	0	261
Total	444	27	11	482	0	482	791	47	16	854	0	854
South Leg												
Approach	0	0	3	3	0	3	0	0	8	8	0	8
Departure	0	0	5	5	0	5	0	0	7	7	0	7
Total	0	0	8	8	0	8	0	0	15	15	0	15
East Leg												
Approach	197	12	8	217	7	224	240	14	8	262	9	271
Departure	247	15	5	267	9	276	551	33	11	595	7	602
Total	444	27	13	484	16	500	791	47	19	857	16	873
West Leg												
Approach	0	0	0	0	9	9	0	0	0	0	7	7
Departure	0	0	0	0	7	7	0	0	0	0	9	9
Total	0	0	0	0	16	16	0	0	0	0	16	16
Total Approaches												
Approach	444	27	16	487	16	503	791	47	25	863	16	879
Departure	444	27	16	487	16	503	791	47	25	863	16	879
Total	888	54	32	974	32	1,006	1,582	94	50	1,726	32	1,758

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Table C-3- Horizon Year (2050) Peak Hour PCE Volume Summary

	AM Peak Hour			PM Peak Hour		
	HY (2050) w/o Project Volumes	Project Trips	HY (2050) w/ Project Volumes	HY (2050) w/o Project Volumes	Project Trips	HY (2050) w/ Project Volumes
1 Winston Court - Project Driveway 1/20th Street						
NBL	0	1	1	0	5	5
NBT	0	0	0	0	0	0
NBR	0	0	0	0	0	0
SBL	0	0	0	0	0	0
SBT	0	0	0	0	0	0
SBR	6	0	6	4	0	4
EBL	3	0	3	6	0	6
EBT	4	3	7	0	0	0
EBR	0	5	5	0	3	3
WBL	0	0	0	0	0	0
WBT	4	0	4	0	3	3
WBR	2	0	2	0	0	0
North Leg						
Approach	6	0	6	4	0	4
Departure	5	0	5	6	0	6
Total	11	0	11	10	0	10
South Leg						
Approach	0	1	1	0	5	5
Departure	0	5	5	0	3	3
Total	0	6	6	0	8	8
East Leg						
Approach	6	0	6	0	3	3
Departure	4	3	7	0	0	0
Total	10	3	13	0	3	3
West Leg						
Approach	7	8	15	6	3	9
Departure	10	1	11	4	8	12
Total	17	9	26	10	11	21
Total Approaches						
Approach	19	9	28	10	11	21
Departure	19	9	28	10	11	21
Total	38	18	56	20	22	42

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Table C-3- Horizon Year (2050) Peak Hour PCE Volume Summary

	AM Peak Hour			PM Peak Hour		
	HY (2050) w/o Project Volumes	Project Trips	HY (2050) w/ Project Volumes	HY (2050) w/o Project Volumes	Project Trips	HY (2050) w/ Project Volumes
2 Project Driveway 2/20th Street						
NBL	0	0	0	0	3	3
NBT	0	0	0	0	0	0
NBR	0	0	0	0	0	0
SBL	0	0	0	0	0	0
SBT	0	0	0	0	0	0
SBR	0	0	0	0	0	0
EBL	0	0	0	0	0	0
EBT	4	0	4	0	0	0
EBR	0	3	3	0	0	0
WBL	0	0	0	0	0	0
WBT	6	0	6	0	0	0
WBR	0	0	0	0	0	0
North Leg						
Approach	0	0	0	0	0	0
Departure	0	0	0	0	0	0
Total	0	0	0	0	0	0
South Leg						
Approach	0	0	0	0	3	3
Departure	0	3	3	0	0	0
Total	0	3	3	0	3	3
East Leg						
Approach	6	0	6	0	0	0
Departure	4	0	4	0	0	0
Total	10	0	10	0	0	0
West Leg						
Approach	4	3	7	0	0	0
Departure	6	0	6	0	3	3
Total	10	3	13	0	3	3
Total Approaches						
Approach	10	3	13	0	3	3
Departure	10	3	13	0	3	3
Total	20	6	26	0	6	6

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Table C-3- Horizon Year (2050) Peak Hour PCE Volume Summary

	AM Peak Hour			PM Peak Hour		
	HY (2050) w/o Project Volumes	Project Trips	HY (2050) w/ Project Volumes	HY (2050) w/o Project Volumes	Project Trips	HY (2050) w/ Project Volumes
3 Campus Avenue/Project Driveway 3 - 20th Street						
NBL	0	0	0	0	0	0
NBT	1	0	1	3	0	3
NBR	2	0	2	5	0	5
SBL	278	0	278	649	0	649
SBT	2	0	2	3	0	3
SBR	0	0	0	0	0	0
EBL	0	0	0	0	0	0
EBT	0	9	9	0	7	7
EBR	0	0	0	0	0	0
WBL	3	0	3	4	0	4
WBT	0	7	7	0	9	9
WBR	361	0	361	271	0	271
North Leg						
Approach	280	0	280	652	0	652
Departure	362	0	362	274	0	274
Total	642	0	642	926	0	926
South Leg						
Approach	3	0	3	8	0	8
Departure	5	0	5	7	0	7
Total	8	0	8	15	0	15
East Leg						
Approach	364	7	371	275	9	284
Departure	280	9	289	654	7	661
Total	644	16	660	929	16	945
West Leg						
Approach	0	9	9	0	7	7
Departure	0	7	7	0	9	9
Total	0	16	16	0	16	16
Total Approaches						
Approach	647	16	663	935	16	951
Departure	647	16	663	935	16	951
Total	1,294	32	1,326	1,870	32	1,902

APPENDIX D

INTERSECTION LEVEL OF SERVICE WORKSHEETS

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	4	4	2	0	5
Future Vol, veh/h	2	4	4	2	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	3	5	5	3	0	7

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	8	0	-	0	17	7
Stage 1	-	-	-	-	7	-
Stage 2	-	-	-	-	11	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1625	-	-	-	1006	1082
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1018	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1625	-	-	-	1004	1082
Mov Cap-2 Maneuver	-	-	-	-	1004	-
Stage 1	-	-	-	-	1020	-
Stage 2	-	-	-	-	1018	-

Approach	EB	WB	SB
HCM Control Delay, s/v	2.41	0	8.35
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	600	-	-	-	1082
HCM Lane V/C Ratio	0.002	-	-	-	0.006
HCM Control Delay (s/veh)	7.2	0	-	-	8.3
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	6.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	0	0	0	0	3
Future Vol, veh/h	5	0	0	0	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	67	67	67	67	67	67
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	7	0	0	0	0	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1	0	-	0	16	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	15	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1634	-	-	-	1007	1089
Stage 1	-	-	-	-	1027	-
Stage 2	-	-	-	-	1013	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1634	-	-	-	1002	1089
Mov Cap-2 Maneuver	-	-	-	-	1002	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1013	-

Approach	EB	WB	SB
HCM Control Delay, s/v	7.21	0	8.32
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1634	-	-	-	1089
HCM Lane V/C Ratio	0.005	-	-	-	0.004
HCM Control Delay (s/veh)	7.2	0	-	-	8.3
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	4	4	2	0	6
Future Vol, veh/h	3	4	4	2	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	4	5	5	3	0	8

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	8	0	-	0	20	7
Stage 1	-	-	-	-	7	-
Stage 2	-	-	-	-	13	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1625	-	-	-	1002	1082
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1015	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1625	-	-	-	1000	1082
Mov Cap-2 Maneuver	-	-	-	-	1000	-
Stage 1	-	-	-	-	1019	-
Stage 2	-	-	-	-	1015	-

Approach	EB	WB	SB
HCM Control Delay, s/v	3.09	0	8.35
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	771	-	-	-	1082
HCM Lane V/C Ratio	0.002	-	-	-	0.007
HCM Control Delay (s/veh)	7.2	0	-	-	8.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	214	1	2	265	2
Future Vol, veh/h	3	214	1	2	265	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	3	225	1	2	279	2

Major/Minor	Minor2	Major2		
Conflicting Flow All	560	2	0	0
Stage 1	560	-	-	-
Stage 2	0	-	-	-
Critical Hdwy	6.5	6.2	4.1	-
Critical Hdwy Stg 1	5.5	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	4	3.3	2.2	-
Pot Cap-1 Maneuver	440	1088	-	-
Stage 1	514	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %				-
Mov Cap-1 Maneuver	0	1088	-	-
Mov Cap-2 Maneuver	0	-	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-

Approach	NB	SB
HCM Control Delay, s/v	8.32	
HCM LOS	A	

Minor Lane/Major Mvmt	NBLn1	SBL	SBT
Capacity (veh/h)	1088	-	-
HCM Lane V/C Ratio	0.003	-	-
HCM Control Delay (s/veh)	8.3	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0	-	-

Intersection	
Int Delay, s/veh	7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	0	0	0	0	4
Future Vol, veh/h	6	0	0	0	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	67	67	67	67	67	67
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	9	0	0	0	0	6

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1	0	-	0	19	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	18	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1634	-	-	-	1003	1089
Stage 1	-	-	-	-	1027	-
Stage 2	-	-	-	-	1010	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1634	-	-	-	998	1089
Mov Cap-2 Maneuver	-	-	-	-	998	-
Stage 1	-	-	-	-	1021	-
Stage 2	-	-	-	-	1010	-

Approach	EB	WB	SB
HCM Control Delay, s/v	7.21	0	8.32
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1634	-	-	-	1089
HCM Lane V/C Ratio	0.005	-	-	-	0.005
HCM Control Delay (s/veh)	7.2	0	-	-	8.3
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	258	3	5	590	3
Future Vol, veh/h	4	258	3	5	590	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	4	272	3	5	621	3

Major/Minor	Minor2		Major2	
Conflicting Flow All	1245	3	0	0
Stage 1	1245	-	-	-
Stage 2	0	-	-	-
Critical Hdwy	6.5	6.2	4.1	-
Critical Hdwy Stg 1	5.5	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	4	3.3	2.2	-
Pot Cap-1 Maneuver	175	1087	-	-
Stage 1	248	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %				-
Mov Cap-1 Maneuver	0	1087	-	-
Mov Cap-2 Maneuver	0	-	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-

Approach	NB	SB
HCM Control Delay, s/v	8.34	
HCM LOS	A	

Minor Lane/Major Mvmt	NBLn1	SBL	SBT
Capacity (veh/h)	1087	-	-
HCM Lane V/C Ratio	0.008	-	-
HCM Control Delay (s/veh)	8.3	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0	-	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	7	5	0	4	2	1	0	0	0	0	6
Future Vol, veh/h	3	7	5	0	4	2	1	0	0	0	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	75	75	75	75	75	75	75	75	75
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	4	9	7	0	5	3	1	0	0	0	0	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	8	0	0	16	0	0	26	29	13	24	31	7
Stage 1	-	-	-	-	-	-	21	21	-	7	7	-
Stage 2	-	-	-	-	-	-	5	8	-	17	24	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1625	-	-	1615	-	-	990	868	1074	993	866	1082
Stage 1	-	-	-	-	-	-	1003	882	-	1020	894	-
Stage 2	-	-	-	-	-	-	1022	893	-	1007	879	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1625	-	-	1615	-	-	980	866	1074	990	864	1082
Mov Cap-2 Maneuver	-	-	-	-	-	-	980	866	-	990	864	-
Stage 1	-	-	-	-	-	-	1001	880	-	1020	894	-
Stage 2	-	-	-	-	-	-	1014	893	-	1005	877	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	1.44	0	8.68	8.35
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	980	332	-	-	1615	-	-	1082
HCM Lane V/C Ratio	0.001	0.002	-	-	-	-	-	0.007
HCM Control Delay (s/veh)	8.7	7.2	0	-	0	-	-	8.4
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	4	3	0	6	0	0
Future Vol, veh/h	4	3	0	6	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	4	3	0	6	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	7	0	12	6
Stage 1	-	-	-	-	6	-
Stage 2	-	-	-	-	6	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1626	-	1013	1083
Stage 1	-	-	-	-	1023	-
Stage 2	-	-	-	-	1022	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1626	-	1013	1083
Mov Cap-2 Maneuver	-	-	-	-	1013	-
Stage 1	-	-	-	-	1023	-
Stage 2	-	-	-	-	1022	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1626	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s/veh)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

3: Private Driveway /Campus Avenue & Project Driveway 3/20th Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.2	0.1	0.2	0.2
Total Delay (hr)	0.0	0.1	0.0	0.1	0.1
Total Del/Veh (s)	4.9	1.0	3.1	0.9	1.0
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	2.4	0.0	2.5	0.0	0.1

Intersection	
Int Delay, s/veh	5.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	0	3	0	3	0	5	0	0	0	0	4
Future Vol, veh/h	6	0	3	0	3	0	5	0	0	0	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	67	67	67	67	67	67	67	67	67	67	67	67
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	9	0	4	0	4	0	7	0	0	0	0	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	4	0	0	4	0	0	25	25	2	22	27	4
Stage 1	-	-	-	-	-	-	20	20	-	4	4	-
Stage 2	-	-	-	-	-	-	4	4	-	18	22	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1630	-	-	1630	-	-	992	873	1088	995	870	1085
Stage 1	-	-	-	-	-	-	1004	883	-	1023	896	-
Stage 2	-	-	-	-	-	-	1023	896	-	1007	881	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1630	-	-	1630	-	-	981	868	1088	989	865	1085
Mov Cap-2 Maneuver	-	-	-	-	-	-	981	868	-	989	865	-
Stage 1	-	-	-	-	-	-	998	878	-	1023	896	-
Stage 2	-	-	-	-	-	-	1017	896	-	1001	876	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	4.81	0	8.7	8.34
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	981	1000	-	-	1630	-	-	1085
HCM Lane V/C Ratio	0.008	0.005	-	-	-	-	-	0.006
HCM Control Delay (s/veh)	8.7	7.2	0	-	0	-	-	8.3
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	5.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	0	3	0
Future Vol, veh/h	0	0	0	0	3	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	3	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1	0	2	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	1	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1635	-	1026	1089
Stage 1	-	-	-	-	1027	-
Stage 2	-	-	-	-	1027	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1635	-	1026	1089
Mov Cap-2 Maneuver	-	-	-	-	1026	-
Stage 1	-	-	-	-	1027	-
Stage 2	-	-	-	-	1027	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	8.52
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1026	-	-	1635	-
HCM Lane V/C Ratio	0.003	-	-	-	-
HCM Control Delay (s/veh)	8.5	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

3: Private Driveway /Campus Avenue & Project Driveway 3/20th Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Delay (hr)	0.0	0.0	0.0	0.1	0.1
Denied Del/Veh (s)	0.1	0.3	0.1	0.6	0.5
Total Delay (hr)	0.0	0.1	0.0	0.4	0.5
Total Del/Veh (s)	7.2	1.0	3.9	2.2	1.9
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	4.9	0.0	3.6	0.1	0.1

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	4	4	2	0	6
Future Vol, veh/h	3	4	4	2	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	3	4	4	2	0	6

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	6	0	-	0	16	5
Stage 1	-	-	-	-	5	-
Stage 2	-	-	-	-	11	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1628	-	-	-	1008	1084
Stage 1	-	-	-	-	1023	-
Stage 2	-	-	-	-	1018	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1628	-	-	-	1006	1084
Mov Cap-2 Maneuver	-	-	-	-	1006	-
Stage 1	-	-	-	-	1021	-
Stage 2	-	-	-	-	1018	-

Approach	EB	WB	SB
HCM Control Delay, s/v	3.09	0	8.34
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	771	-	-	-	1084
HCM Lane V/C Ratio	0.002	-	-	-	0.006
HCM Control Delay (s/veh)	7.2	0	-	-	8.3
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	361	1	2	278	2
Future Vol, veh/h	3	361	1	2	278	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	3	380	1	2	293	2

Major/Minor	Minor2		Major2	
Conflicting Flow All	587	2	0	0
Stage 1	587	-	-	-
Stage 2	0	-	-	-
Critical Hdwy	6.5	6.2	4.1	-
Critical Hdwy Stg 1	5.5	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	4	3.3	2.2	-
Pot Cap-1 Maneuver	424	1088	-	-
Stage 1	500	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %				-
Mov Cap-1 Maneuver	0	1088	-	-
Mov Cap-2 Maneuver	0	-	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-

Approach	NB	SB
HCM Control Delay, s/v	8.32	
HCM LOS	A	

Minor Lane/Major Mvmt	NBLn1	SBL	SBT
Capacity (veh/h)	1088	-	-
HCM Lane V/C Ratio	0.003	-	-
HCM Control Delay (s/veh)	8.3	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0	-	-

Intersection	
Int Delay, s/veh	7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	0	0	0	0	4
Future Vol, veh/h	6	0	0	0	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	6	0	0	0	0	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1	0	-	0	14	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	13	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1635	-	-	-	1011	1089
Stage 1	-	-	-	-	1027	-
Stage 2	-	-	-	-	1015	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1635	-	-	-	1007	1089
Mov Cap-2 Maneuver	-	-	-	-	1007	-
Stage 1	-	-	-	-	1024	-
Stage 2	-	-	-	-	1015	-

Approach	EB	WB	SB
HCM Control Delay, s/v	7.21	0	8.32
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1635	-	-	-	1089
HCM Lane V/C Ratio	0.004	-	-	-	0.004
HCM Control Delay (s/veh)	7.2	0	-	-	8.3
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	271	3	5	649	3
Future Vol, veh/h	4	271	3	5	649	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	4	285	3	5	683	3

Major/Minor	Minor2		Major2	
Conflicting Flow All	1369	3	0	0
Stage 1	1369	-	-	-
Stage 2	0	-	-	-
Critical Hdwy	6.5	6.2	4.1	-
Critical Hdwy Stg 1	5.5	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	4	3.3	2.2	-
Pot Cap-1 Maneuver	148	1087	-	-
Stage 1	216	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %				-
Mov Cap-1 Maneuver	0	1087	-	-
Mov Cap-2 Maneuver	0	-	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-

Approach	NB	SB
HCM Control Delay, s/v	8.34	
HCM LOS	A	

Minor Lane/Major Mvmt	NBLn1	SBL	SBT
Capacity (veh/h)	1087	-	-
HCM Lane V/C Ratio	0.008	-	-
HCM Control Delay (s/veh)	8.3	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0	-	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	7	5	0	4	2	1	0	0	0	0	6
Future Vol, veh/h	3	7	5	0	4	2	1	0	0	0	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	3	7	5	0	4	2	1	0	0	0	0	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	6	0	0	13	0	0	21	23	10	19	24	5
Stage 1	-	-	-	-	-	-	16	16	-	5	5	-
Stage 2	-	-	-	-	-	-	4	6	-	14	19	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1628	-	-	1619	-	-	998	875	1077	1000	873	1084
Stage 1	-	-	-	-	-	-	1008	886	-	1022	895	-
Stage 2	-	-	-	-	-	-	1023	894	-	1012	884	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1628	-	-	1619	-	-	990	873	1077	998	871	1084
Mov Cap-2 Maneuver	-	-	-	-	-	-	990	873	-	998	871	-
Stage 1	-	-	-	-	-	-	1007	884	-	1022	895	-
Stage 2	-	-	-	-	-	-	1017	894	-	1010	882	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	1.44	0	8.64	8.34
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	990	332	-	-	1619	-	-	1084
HCM Lane V/C Ratio	0.001	0.002	-	-	-	-	-	0.006
HCM Control Delay (s/veh)	8.6	7.2	0	-	0	-	-	8.3
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	4	3	0	6	0	0
Future Vol, veh/h	4	3	0	6	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	4	3	0	6	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	7	0	12	6
Stage 1	-	-	-	-	6	-
Stage 2	-	-	-	-	6	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1626	-	1013	1083
Stage 1	-	-	-	-	1023	-
Stage 2	-	-	-	-	1022	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1626	-	1013	1083
Mov Cap-2 Maneuver	-	-	-	-	1013	-
Stage 1	-	-	-	-	1023	-
Stage 2	-	-	-	-	1022	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1626	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s/veh)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

3: Private Driveway /Campus Avenue & Project Driveway 3/20th Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.1
Denied Del/Veh (s)	0.1	0.3	0.1	0.3	0.3
Total Delay (hr)	0.0	0.2	0.0	0.1	0.3
Total Del/Veh (s)	5.1	1.6	2.8	1.0	1.4
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	2.7	0.0	2.6	0.0	0.0

Intersection	
Int Delay, s/veh	5.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	0	3	0	3	0	5	0	0	0	0	4
Future Vol, veh/h	6	0	3	0	3	0	5	0	0	0	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	6	0	3	0	3	0	5	0	0	0	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	3	0	0	3	0	0	17	17	2	16	19	3
Stage 1	-	-	-	-	-	-	14	14	-	3	3	-
Stage 2	-	-	-	-	-	-	3	3	-	13	16	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1632	-	-	1632	-	-	1002	881	1089	1005	879	1087
Stage 1	-	-	-	-	-	-	1011	888	-	1025	897	-
Stage 2	-	-	-	-	-	-	1025	897	-	1013	886	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1632	-	-	1632	-	-	995	877	1089	1001	876	1087
Mov Cap-2 Maneuver	-	-	-	-	-	-	995	877	-	1001	876	-
Stage 1	-	-	-	-	-	-	1007	884	-	1025	897	-
Stage 2	-	-	-	-	-	-	1021	897	-	1009	883	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	4.81	0	8.64	8.33
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	995	1000	-	-	1632	-	-	1087
HCM Lane V/C Ratio	0.005	0.004	-	-	-	-	-	0.004
HCM Control Delay (s/veh)	8.6	7.2	0	-	0	-	-	8.3
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	5.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	0	3	0
Future Vol, veh/h	0	0	0	0	3	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	3	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1	0	2	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	1	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1635	-	1026	1089
Stage 1	-	-	-	-	1027	-
Stage 2	-	-	-	-	1027	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1635	-	1026	1089
Mov Cap-2 Maneuver	-	-	-	-	1026	-
Stage 1	-	-	-	-	1027	-
Stage 2	-	-	-	-	1027	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	8.52
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1026	-	-	1635	-
HCM Lane V/C Ratio	0.003	-	-	-	-
HCM Control Delay (s/veh)	8.5	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

3: Private Driveway /Campus Avenue & Project Driveway 3/20th Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Delay (hr)	0.0	0.0	0.0	0.1	0.1
Denied Del/Veh (s)	0.1	0.2	0.1	0.6	0.4
Total Delay (hr)	0.0	0.1	0.0	0.4	0.5
Total Del/Veh (s)	8.5	1.1	9.5	2.2	2.0
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.1
Stop Del/Veh (s)	6.2	0.0	8.7	0.1	0.2