Michael Baker
INTERNATIONAL

DRAFT INITIAL STUDY AND MITIGATED NEGATIVE DECLARATION

Assessor Parcel Number 298-162-37
Ida Avenue Apartments Project

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May 2022

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TABLE OF CONTENTS

1.0 INTRODUCTION 1-0
1.1 Introduction and Regulatory Guidance 1-1
1.2 Lead Agency 1-1
1.3 Purpose And Document Organization 1-2
2.0 PROJECT DESCRIPTION 2-1
2.1 Project Location and Setting 2-1
2.2 Anticipated Discretionary Actions and Approvals 2-4
2.3 Technical Studies 2-4
3.0 ENVIRONMENTAL CHECKLIST 3-1
3.1 Environmental Factors Potentially Affected 3-1
3.2 Determination 3-2
3.3 Evaluation of Environmental Impacts 3-3
1. Aesthetics 3-12
2. Agriculture and Forestry Resources 3-16
3. Air Quality 3-19
4. Biological Resources 3-29
5. Cultural Resources 3-35
6. Energy 3-40
7. Geology and Soils 3-44
8. Greenhouse Gas Emissions 3-51
9. Hazards and Hazardous Materials 3-58
10. Hydrology and Water Quality 3-64
11. Land Use and Planning 3-70
12. Mineral Resources 3-72
13. Noise 3-73
14. Population and Housing 3-81
15. Public Services 3-83
16. Recreation 3-87
17. Transportation 3-89
18. Tribal Cultural Resources 3-93
19. Utilities and Service Systems 3-96
20. Wildfire 3-102
21. Mandatory Findings of Significance 3-105
4.0 DOCUMENT PREPARERS AND REFERENCES 4-1

LIST OF FIGURES

Figure 1 Regional/Local Vicinity Map....2-5
Figure 2A Aerial Photograph....2-7
Figure 2B On-site/Off-site Photographs....2-9
Figure 3 Site Plan....2-11
Figure 4A Renderings....2-13
Figure 4B Elevations....2-15
Figure 5 Conceptual Landscape Plan....2-17
Figure 6 Lighting Plan....2-19
Figure 7 Biological Resources - Impacts....2-21
Figure 8 Noise Measurement and Modeling Locations....2-23

LIST OF TABLES

Table 2-1. Project Summary....2-2
Table 2-2. Required Approvals and Permits....2-4
Table 3-1. Estimated Maximum Daily Construction Criteria Air Pollutant Emissions....3-21
Table 3-2. Estimated Maximum Daily Operational Criteria Air Pollutant Emissions....3-22
Table 3-3. Pollutants, Sources, Health Effects, and Attainment Status....3-25
Table 8-1. Estimated Annual Construction Greenhouse Gas Emissions....3-53
Table 8-2. Estimated Annual Operational Greenhouse Gas Emissions....3-54
Table 8-3. 2019 Federal Regional Transportation Plan Consistency Analysis....3-55
Table 13-1. Typical Construction Equipment Maximum Noise Levels....3-75
Table 13-2. Estimated Distances between Construction Activities and Nearest Noise-sensitive Receptors....3-76
Table 13-3. Predicted Construction Noise Levels per Activity Phase....3-77
Table 13-4. Off-site Roadway Traffic Noise Modeling Results....3-78

APPENDICES

Appendix A Air Quality/Greenhouse Gas Emissions Technical Report
Appendix B Biological Resources Assessment
Appendix C Cultural Resources Inventory Report
Appendix D-1 Preliminary Drainage Report
Appendix D-2 Water Quality Technical Report
Appendix E Noise Technical Report
Appendix F Trip Generation Assessment
Appendix G AB 52 Consultation Documentation

1.0 INTRODUCTION

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1.1 INTRODUCTION AND REGULATORY GUIDANCE

This document is an Initial Study (IS) with supporting environmental studies, pursuant to the California Environmental Quality Act (CEQA), for the Ida Avenue Apartments Project (proposed project).

The Initial Study is a public document to be used by the City of Solana Beach (City), acting as the CEQA lead agency, to determine whether the project may have a significant effect on the environment pursuant to CEQA. Generally, if the lead agency finds substantial evidence that any aspect of the project, either individually or cumulatively, may have a significant effect on the environment that cannot be mitigated, the lead agency is required to prepare an environmental impact report (EIR) (Public Resources Code Sections 21080[d] and 21082.2[d]).

If the agency finds no substantial evidence that the project or any of its aspects may cause a significant impact on the environment with the incorporation of mitigation, a Mitigated Negative Declaration (MND) shall be prepared with a written statement describing the reasons why the proposed project, which is not exempt from CEQA, would not have a significant effect on the environment and therefore does not require the preparation of an EIR (CEQA Guidelines Section 15371).

According to CEQA Guidelines Section 15070, a Negative Declaration shall be prepared for a project subject to CEQA when either:

1) *The initial study shows there is no substantial evidence, in light of the whole record before the agency, that the project may have a significant effect on the environment, or*
2) *The initial study identifies potentially significant effects, but:*
    a) *Revisions in the project plans or proposals made by, or agreed to by the applicant before the proposed mitigated negative declaration and initial study are released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur, and*
    b) *There is no substantial evidence, in light of the whole record before the agency, that the proposed project as revised may have a significant effect on the environment.*

This IS/MND has been prepared in accordance with CEQA, Public Resources Code Section 21000 et seq., and the CEQA Guidelines Title 14 California Code of Regulations (CCR) Section 15000 et seq.

1.2 LEAD AGENCY

Per Section 15367 of the CEQA Guidelines, a lead agency is the public agency with primary responsibility of carrying out or approving a project. To be a CEQA lead agency, the public agency must have discretionary authority over the proposed project.

As the project is located within the City of Solana Beach and the City has sole discretion over project entitlements, the lead agency for the project is the City of Solana Beach. Refer also to Table 2-2, Required Approvals and Permits, below.

1.3 PURPOSE AND DOCUMENT ORGANIZATION

The purpose of this document is to evaluate the potential environmental impacts of the proposed Ida Avenue Apartments Project. This document is divided into the following sections:

1.0 Introduction

This section provides an introduction and describes the purpose and organization of this document.

2.0 Project Description

This section provides a detailed description of the project and the environmental setting, and identifies the various agency approvals required.

3.0 Environmental Checklist

This section describes the environmental setting for each of the environmental subject areas; evaluates a range of impacts classified as “no impact,” “less than significant impact,” “less than significant impact with mitigation incorporated,” or “potentially significant impact” in response to the environmental checklist; provides mitigation measures, where appropriate, to mitigate potentially significant impacts to less than significant levels; and provides an environmental determination of the proposed project.

4.0 Document Preparers and References

This section identifies staff and consultants responsible for preparation of this document. It also lists the resources used in the preparation of this document.

Appendices

The appendices to this document include various technical reports, database records, and modeling printouts that were prepared in support of the analysis provided in the Initial Study.

2.0 PROJECT DESCRIPTION

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2.1 PROJECT LOCATION AND SETTING

Regional Location and Setting

The City of Solana Beach (City) is located on the northern coast of San Diego County. The City is bounded on the west by the Pacific Ocean, on the north by San Elijo Lagoon and the City of Encinitas, and on the south by the Cities of Del Mar and San Diego. To the east are unincorporated areas of San Diego County, which include the communities of Rancho Santa Fe and Fairbanks Ranch, as well as the San Dieguito Regional Park. Major transportation routes to and through the City include Interstate 5 (I-5), Highway 101, Lomas Santa Fe Drive, and Via De La Valle. Refer to Figure 1, Regional/Local Vicinity Map.

Local Location and Setting

The 1.44-acre (gross) project site is located in the central portion of the City of Solana Beach. The site is currently vacant. Ida Avenue borders the property to the west; I-5 runs parallel to the east of the site. The County Assessor Parcel Number (APN) is 298-162-37. Refer to Figure 2A, Aerial Photograph; Figure 2B, On-site/Off-site Photographs; and Figure 3, Site Plan.

The subject property slopes slightly to the west towards Ida Avenue. There is a chain-link fence that runs north/south and separates the eastern side (off-site) from the western side (on-site) of the property.

The approximate 0.50-acre off-site area includes a 0.17-acre area that is vegetated and runs along the east side of the property along I-5, and an additional 0.33-acre area that runs along the west side of the property that encompasses Ida Avenue and is already paved and developed.

The eastern portion of the subject property immediately adjacent to I-5 is California Department of Transportation (Caltrans) right-of-way (ROW), which is regularly irrigated and consists of predominantly native vegetation such as California sagebrush and California buckwheat. The western portion, where development is proposed, is composed of disturbed, non-native vegetation and groundcover such as ice plant, Russian thistle, and telegraph weed. A highly disturbed dirt area, generally used for temporary parking of vehicles, is present in the northern portion of the site.

Surrounding Land Uses

Adjacent properties to the west and south of the project site are occupied by residential uses. The southbound lanes of I-5 parallel the eastern edge of the project site; refer to Figure 2A, Aerial Photograph.

Farther to the north/northwest are several churches, restaurants, a small-scale grocery store, and other retail commercial uses. The La Colonia Park and Skatepark lies to the west. A number of multifamily uses are located farther to the southwest, as well as to the east, across I-5.

Earl Warren Junior High and Skyline Elementary Schools are located approximately 0.8 and 0.9 miles, respectively, northwest of the project site. Santa Fe Christian School is located approximately 0.3 miles to the northwest on Academy Drive and St. Leo's preschool is located approximately 0.2 miles to the northwest.

Applicable Land Use Regulations

The site is designated as "Medium-High Residential" in the City of Solana Beach General Plan. The site is currently zoned as Medium-High Residential. No change to the existing General Plan land use or zoning designations is required to allow for residential use of the site as proposed.

The project site lies within the state-designated Coastal Zone and is therefore subject to the policies identified in the City's Certified Local Coastal Program/Land Use Plan (LCP/LUP) (City of Solana Beach 2013). As the City does not yet have a fully Certified LCP, the project is also subject to the jurisdiction of the California Coastal Commission, and specifically Chapter 3 of the Coastal Act.

Proposed Project

The project proposes to construct one six-unit apartment building (Building #1) and one two-unit apartment building (Building #2) on the project site. Both buildings would be constructed with two levels above-grade with subterranean (underground) parking garages. A total of 15,888 square feet (SF) (including covered and enclosed patio areas) would be provided with the eight apartments, which would range in size from approximately 1,832 SF to 2,093 SF. The project would also provide approximately 3,044 SF of common open space for use by project residents. Guest parking would be accommodated via surface parking spaces (one guest space per four units).

Table 2-1, Project Summary, identifies the various project components. Refer also to Figure 3, Site Plan; Figure 4A, Renderings; and Figure 4B, Elevations, which illustrate the proposed development.

Table 2-1. Project Summary

Apartment Unit #	Square Footage	Number of Bedrooms	Accessible	Unit Parking
Building #1				
Unit 1	1,832	3	No	2 spaces
Unit 2	2,045	3	No	2 spaces
Unit 3	2,085	3	Yes	2 spaces
Unit 4	1,931	3	Yes	2 spaces
Unit 5	2,093	3	No	2 spaces
Unit 6	1,857	3	No	2 spaces
Entrance Lobby	128	--	--	--
Building #2				
Unit 7	1,957	3	No	2 spaces
Unit 8	1,960	3	No	2 spaces

As part of the overall development, Caltrans would acquire approximately 1,055 SF of the project site to support the ultimate buildout width of I-5 adjacent to the eastern side of the property. The project applicant would also be required to dedicate an additional 874 SF to Caltrans for I-5 right-of-way.

Access and Circulation

Vehicular access to the site would be directly from Ida Avenue via five individual driveways, measuring between 14 feet, 0 inches to 20 feet, 0 inches in width. Refer to Figure 3, Site Plan. One driveway would access two exterior uncovered guest parking spaces in the northern portion of the site; two driveways would access the private garages of the two-unit apartment building in the middle of the site; a one-way access drive would lead through the shared garage of the six-unit apartment building and exit to Ida Avenue in the southern portion of the site.

On-site circulation would be provided via proposed pathways, which would grant access to the apartment units and underground parking and guest surface parking areas, as well as the common open space and playground planned in the northern portion of the property.

Landscaping

Ornamental landscaping would be planted on-site to enhance the aesthetic appearance of the property. A variety of trees, shrubs, and ground cover is proposed, as shown in Figure 5, Conceptual Landscape Plan. All proposed ornamental plantings would be a mixture of City-approved native species; the use of non-native species is not proposed. All plantings would be low-water use; recycled water is not available to serve the site.

Parking

Per City requirements for the Medium-High Residential Zone, a total of 18 off-street parking spaces are required, including two on-site parking spaces per unit, and one guest space per every four units. The project proposes two on-site parking spaces per unit (16 spaces) and four guest spaces. One handicap van-accessible space and one regular handicap space are included in the total number of parking spaces proposed.

The six-unit building would include a 9,077 SF shared basement providing underground parking for the six apartment units above. The two-unit building would include two private garages for the two apartment units. Guest parking would be accommodated via surface parking spaces and within the shared parking garage.

Lighting and Signage

The project would install lighting features so as to provide an adequate level of nighttime lighting to ensure public safety and to support movement of vehicles and pedestrians on-site. Minimal lighting would be installed at the access driveways to identify the project entrance and to provide safe ingress and egress, as well as along on-site walkways. Exterior building lighting is also proposed, both as safety lighting and architectural details. Refer to Figure 6, Lighting Plan, which identifies the type and location of the proposed lighting elements.

The project has been designed in conformance with Section 17.60.060, Exterior Lighting Regulations, of the City's Municipal Code, which requires lighting to be "shielded via horizontal cutoff to eliminate all light directed above the horizontal." Additionally, the project would be required to demonstrate that spill light onto adjacent properties does not exceed "0.2 foot-candles measured in the horizontal or vertical plane at a point five feet inside the adjacent property.

No signage is proposed to identify the apartment complex. The apartments would be numbered to identify individual units.

Project Construction

It is anticipated that project construction would occur over approximately 11 months beginning in fourth quarter 2022. The general construction phasing and approximate duration are summarized below:

- Site Preparation: 2 days
- Grading: 1 week
- Building Construction: 9 weeks
- Paving: 2 weeks
- Architectural Coating: 2 weeks

Construction worker and vendor trips to and from the site would occur throughout the estimated 11-month project construction phase. Proposed grading totaling approximately 8,945 cubic yards (c.y.) of cut and 235 c.y. of fill is anticipated, which includes grading required within the Caltrans ROW. Additionally, 8,795 c.y. of soil would be exported from the site (largely generated by excavation for the proposed underground parking).

Operational Characteristics

Once construction is completed, the 8 on-site apartment units would be rented and occupied by tenants. The project is anticipated to generate 48 average daily trips (ADT) to and from the site (LL&G 2020).

Landscape maintenance is expected to be ongoing on-site over the life of the project. Such maintenance activities may include the use of lawn mowers, shredders/grinders, blowers, trimmers, chainsaws, hedge trimmers, or similar maintenance equipment.

2.2 ANTICIPATED DISCRETIONARY ACTIONS AND APPROVALS

Project entitlements/discretionary actions and other approvals required for the project are anticipated to include, but may not be limited to, those identified in Table 2-2, Required Approvals and Permits.

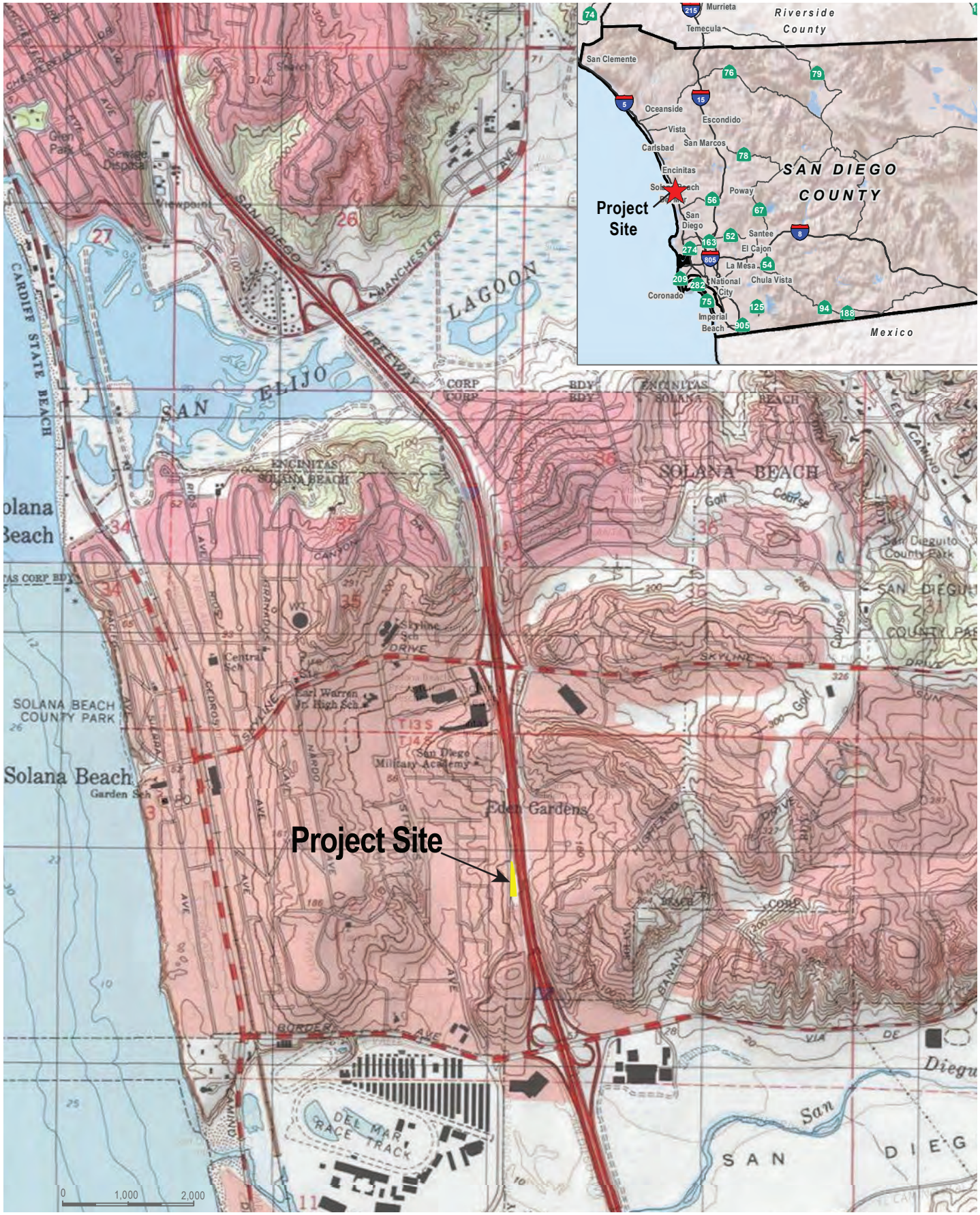
Table 2-2. Required Approvals and Permits

Permit/Action Required	Approving Agency	Lead/Trustee/Responsible Agency
Development Review Permit	City of Solana Beach	City of Solana Beach
Structure Development Permit	City of Solana Beach	City of Solana Beach
Coastal Development Permit	California Coastal Commission	California Coastal Commission
Grading Permit	City of Solana Beach	City of Solana Beach
Building Permit	City of Solana Beach	City of Solana Beach
ROW Encroachment Permit(s)	Caltrans & City of Solana Beach	Caltrans & City of Solana Beach
Stormwater Quality Management Plan	City of Solana Beach	Regional Water Quality Control Board
General Construction Permit	Regional Water Quality Control Board	Regional Water Quality Control Board

2.3 TECHNICAL STUDIES

Technical studies were prepared in support of the IS/MND and are included as the following appendices:

- Appendix A: Air Quality & Greenhouse Gas Emissions Technical Report
- Appendix B: Biological Resources Assessment
- Appendix C: Cultural Resources Inventory Report
- Appendix D-1: Preliminary Drainage Report
- Appendix D-2: Water Quality Technical Report
- Appendix E: Noise Technical Report
- Appendix F: Trip Generation Assessment
- Appendix G: AB 52 Consultation Documentation



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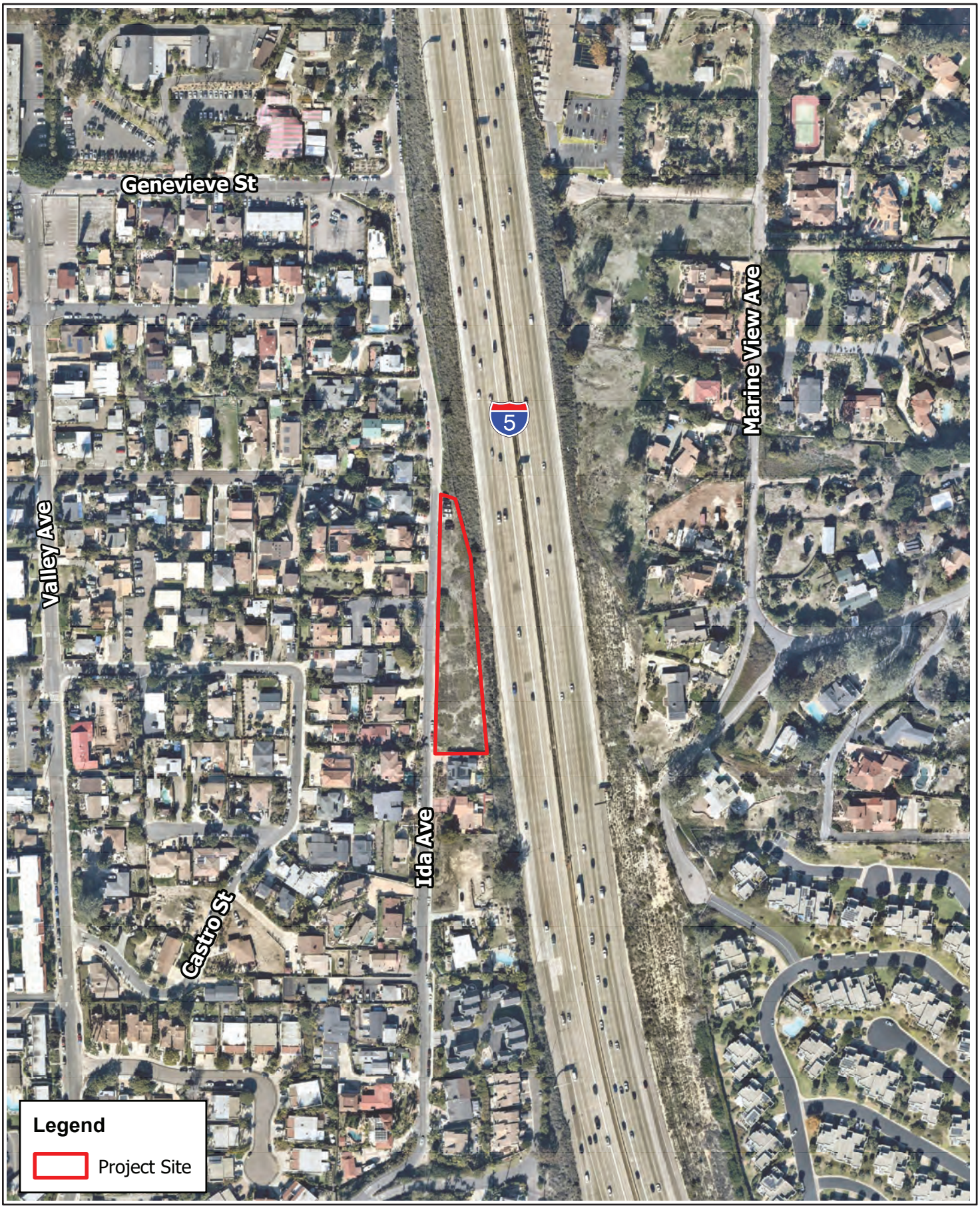
Source: USGS 7.5-Minute Series Del Mar Quadrangle, Dudek 2021

IDA AVENUE APARTMENTS PROJECT

Regional/Local Vicinity Map

Figure 1

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0 250 500 Feet

Source: ESRI, Nearmap, SanGIS

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Project Location Map

Figure 2A

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Photo 1: View looking southeast from along Ida Avenue.



Photo 2: View looking north from within subject property.



Photo 3: View looking south along Interstate 5 and adjacent to eastern property line (within Caltrans right-of-way).



Photo 4: View looking north along Interstate 5 and adjacent to eastern property boundary (within Caltrans right-of-way).

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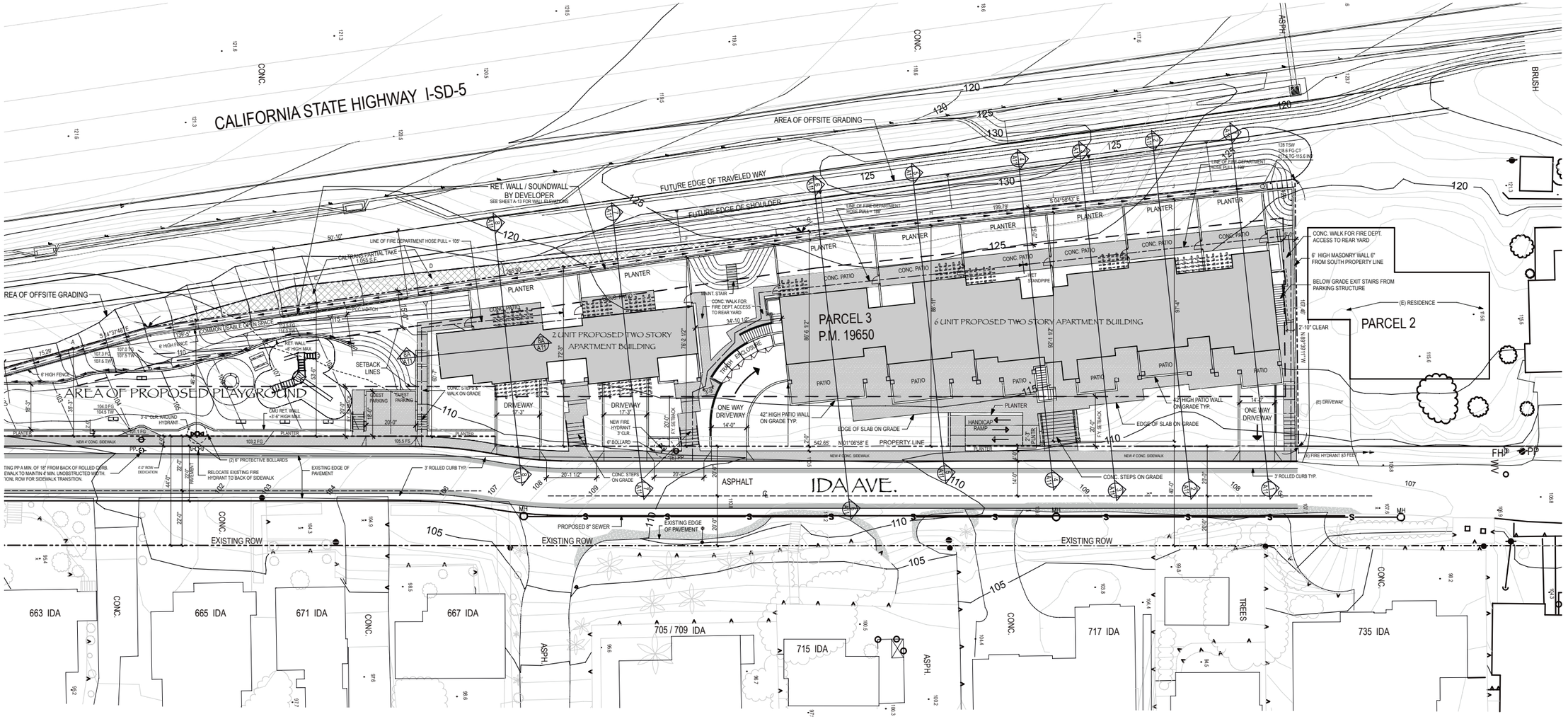
Source: Dudek, 2021

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On-site/Off-site Photographs

Figure 2B

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N SITE PLAN

BASE DENSITY

BASE DENSITY ALLOWED: 8-12 UNITS PER NET ACRE

NET SITE AREA: 38,904 SQ. FT = .89 ACRES.

UNITS ALLOWED: 7

UNITS PROPOSED: 8

SITE PLAN INFORMATION

APPLICANT: SHANTU PATEL; KNN MANAGEMENT LLC 760-214-8558

A.P.N. 298-162-37

ZONE: MHRd

PARKING SPACES REQUIRED: 18
PARKING SPACES PROVIDED: 18

GROSS LOT AREA: 40,833 SQ. FT.

NET LOT AREA: 38,904 SQ. FT. (-874 SQ. FT. FOR R.O.W. DEDICATION & -1,055 SQ. FT. FOR CALTRANS TAKE)

FIRST FLOOR LIVING AREA: 8,143 SQ. FT.

SECOND FLOOR LIVING AREA: 6,476 SQ. FT.

BASEMENT / GARAGE AREA: 10,887 SQ. FT. (NOT INLUDED IN F.A.R.)

EXTERIOR COVERED PATIO: 1,141 SQ. FT. (ENCLOSED 3 SIDES)

COMMON USABLE OPEN SPACE (PLAYGROUND): 3,044 SQ. FT.

GRADING INFORMATION

W C.Y. 8,710 SITE GRADING

X C.Y. 85 EXCAVATION FOR FOOTINGS

Y C.Y. 2,733 REMOVAL & RECOMPACTION

Z C.Y. 11,451 TOTAL GRADING (W+X+Y)

FRONT YARD SETBACK

FRONT YARD SETBACK MAY BE REDUCED FROM 25' TO 20' IF THE AVERAGE LOT DEPTH IS LESS THAN 100 FEET

A	35'-3"
B	46'-8"
C	53'-6"
D	60'-7"
E	72'-3"
F	79'-5"
G	86'-6"
H	91'-9"
I	97'-1"
J	102'-3"
TOTAL	725'-3" / 10 = 72'-6" (LESS THAN 100')

20' FRONT YARD SETBACK IS ALLOWED

REAR YARD SETBACK

REAR YARD SETBACK MAY BE REDUCED FROM 25' TO 15' IF THE AVERAGE LOT DEPTH IS LESS THAN 90 FEET

15' REAR YARD SETBACK IS ALLOWED

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Not to Scale

Source: Chereskin Architecture, 10-28-21

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Site Plan

Figure 3

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PLAYGROUND VIEW



STREET VIEW from SOUTH



REAR YARD VIEW from SOUTH



IDA AVENUE OVERVIEW



STREET VIEW from NORTH



ROOF VIEW

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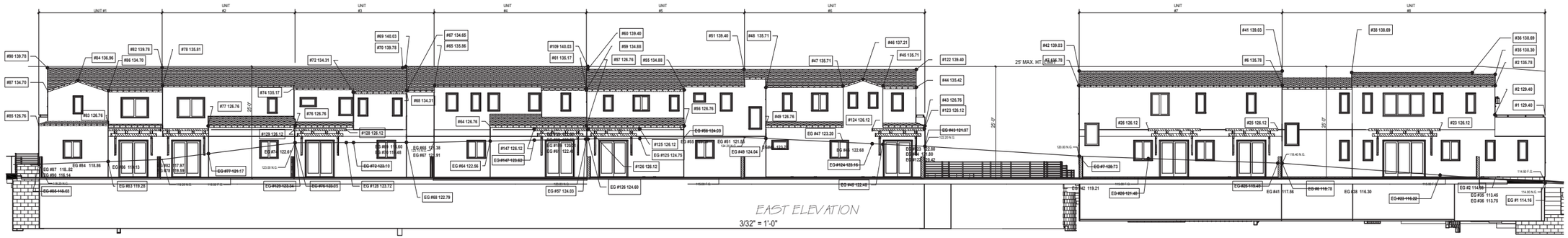
Source: Chereskin Architecture, 2020

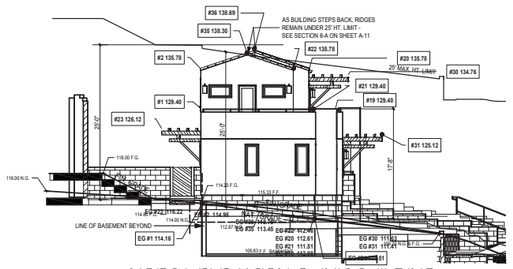
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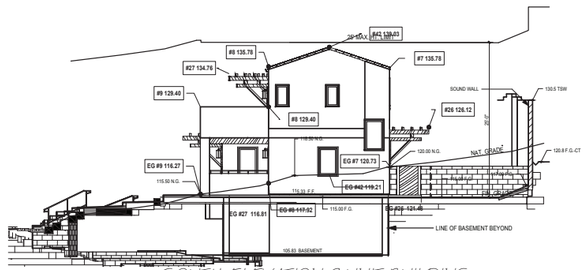
Renderings

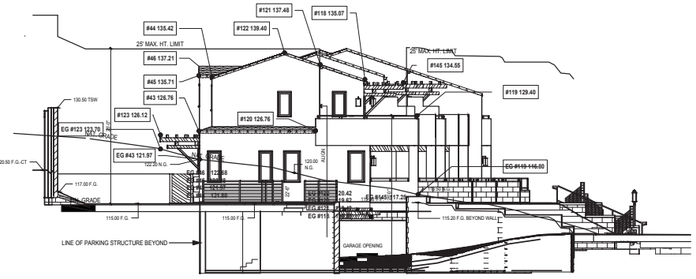
Figure 4A

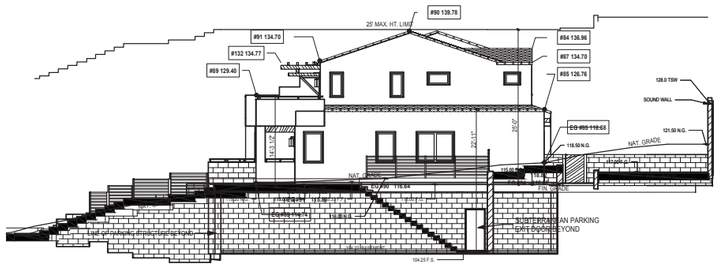
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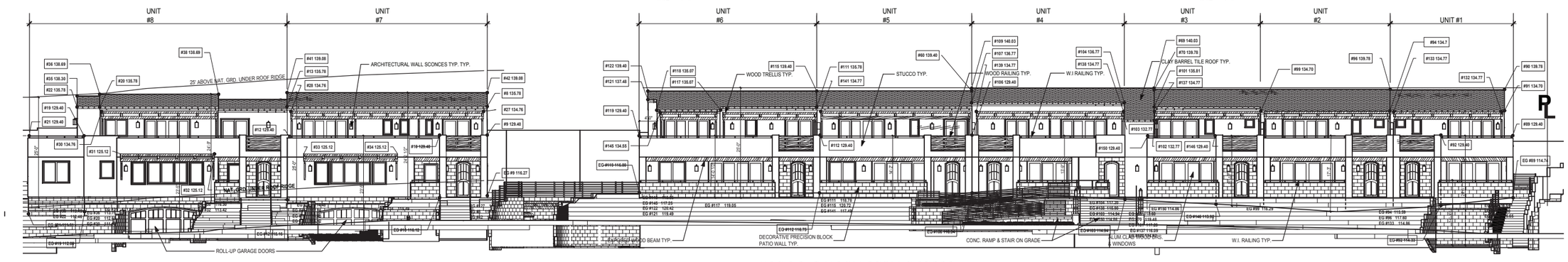












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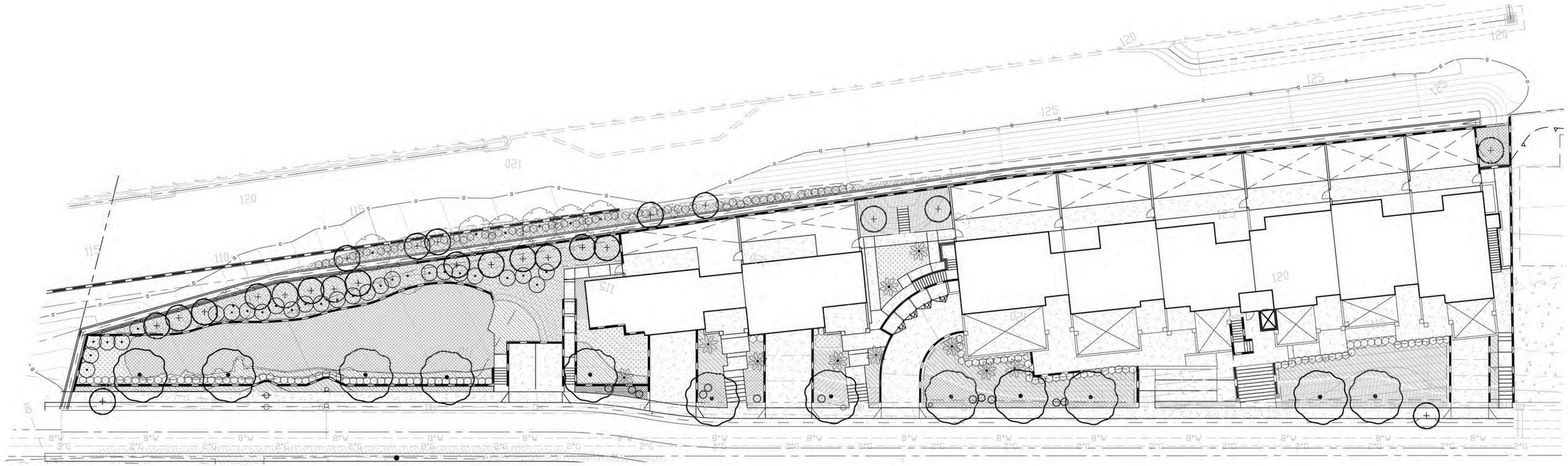
Source: Chereskin Architecture, 05-26-20

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Elevations

Figure 4B

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PLANT SCHEDULE

TREES	BOTANICAL / COMMON NAME	CONT	QTY	WUCOLS	HEIGHT	WIDTH
	DRACAENA DRACO / DRAGON TREE	36"BOX	10	VERY LOW	20'	20'
	GEIJERA PARVIFLORA / AUSTRALIAN WILLOW	36"BOX	8	LOW	25'	18'
	LOPHOSTEMON CONFERTUS / BRISBANE BOX	24"BOX	24	MODERATE	40'	20'
	ZELKOVA SERRATA / SAWLEAF ZELKOVA	24"BOX	12	LOW	50'	50'

SHRUBS	BOTANICAL / COMMON NAME	SIZE	QTY	WUCOLS	HEIGHT	WIDTH
	AGAVE ATTENUATA / AGAVE	5 GAL	12	LOW	4'	6'
	HETEROMELES ARBUTIFOLIA / TOYON	5 GAL	27	LOW	10'	8'
	PODOCARPUS MACROPHYLLUS MAKI / SHRUBBY YEW	15 GAL	19	MODERATE	15'	6'
	PODOCARPUS X `ICEE BLUE` / ICEE BLUE PODOCARPUS	15 GAL	10	MODERATE	25'	20'
	WESTRINGIA FRUTICOSA / COAST ROSEMARY	5 GAL	155	LOW	4'	8'

SHRUB AREAS	BOTANICAL / COMMON NAME	CONT	SPACING	QTY	WUCOLS	HEIGHT	WIDTH
	FESTUCA MAIREI / ATLAS FESCUE	1 GAL	30" o.c.	147	LOW	2'	2'

GROUND COVERS	BOTANICAL / COMMON NAME	CONT	SPACING	QTY	WUCOLS	HEIGHT	WIDTH
	BACCHARIS PILULARIS CONSANGUINEA `POZO SURF` / LOWLY COYOTE BRUSH	1 GAL	30" o.c.	1,307 SF	LOW	1'	8'
	CAREX DIVULSA / BERKELEY SEDGE	4"POT	18" o.c.	3,797 SF	LOW	1'	1'
	CHONDROPETALUM TECTORUM / CAPE RUSH	1 GAL	24" o.c.	621 SF	LOW	2'	3'
	LONICERA JAPONICA `HALLIANA` / HALLS HONEYSUCKLE FLOWERING VINE	FLAT	24" o.c.	2,987 SF	VERY LOW	2'	2.5'
	ROSMARINUS OFFICINALIS `PROSTRATUS` / DWARF ROSEMARY	1 GAL	24" o.c.	1,969 SF	LOW	2'	6'
	SENECIO SERPENS `BLUE CHALK STICKS` / SENECIO	1 GAL	12" o.c.	152 SF	LOW	1'	2'
	TRACHELOSPERMUM ASIATICUM / ASIAN JASMINE	1 GAL	12" o.c.	105 SF	MODERATE	1.5'	10'

0 8' 16' 24' 32'

Source: Stone Grove Landscape Architects, 9/29/2020

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Conceptual Landscape Plan

Figure 5

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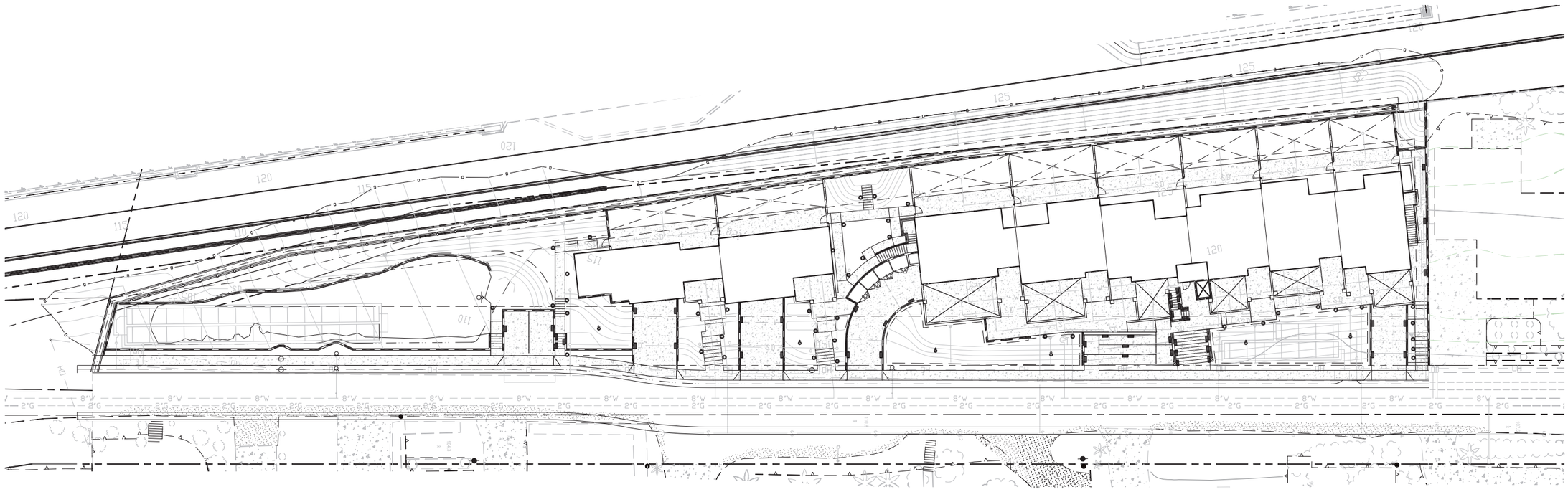






NOTES:
- ALLOW 3' OF EXTRA WIRE FOR FIELD ADJUSTMENTS FOR PATH LIGHTS AND UP LIGHTS
- ALL WORK TO BE PER LOCAL CODES
- ALL 110 OUTLETS IN LANDSCAPING TO BE GFI PROTECTED AND SET 6" MIN. ABOVE GRADE OR PER LOCAL CODE
- TRANSFORMER TO TIE INTO HOUSE SYSTEM
- FIXTURES TO HAVE GROUND SPIKES
- FIXTURES TO HAVE FROSTED GLASS
- FIXTURES NOT TO BE DIRECTED TO NEIGHBORS LOTS

LANDSCAPE CONTRACTOR SHALL VERIFY IN THE FIELD FOR THE CORRECT WIRE GAUGE, VOLTAGE, SLEEVES & BEST LOCATION FOR TRANSFORMER, PHOTOCELL, AND SOUND SYSTEM.



LANDSCAPE LIGHTING LEGEND

	DESCRIPTION	VOLT.	QUA.	WATT.	TOTAL WATT.
	LANDSCAPE PATH LIGHT FX LUMINARE TM-ZD-3LED-18RA-SB	LV	65	1 w	65
	DIRECTED LIGHT FX LUMINARE NP-ZD-6LED-SB	LV	6	3 w	18
	WALL LIGHT FX LUMINARE MO-ZD-3LED-RD-AB W/ FROSTED GLASS	LV	47	3 w	141
				TOTAL	224W

T	VOLT 300W TRANSFORMER SS

Michael Baker INTERNATIONAL

File: 178164Figures.indd

Not to Scale

Source: Stone Grove Landscape Architects, 04-20-20

IDA AVENUE APARTMENTS PROJECT

Lighting Plan

Figure 6

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Michael Baker INTERNATIONAL

File: 178164Figures.indd

0 30 60 Feet

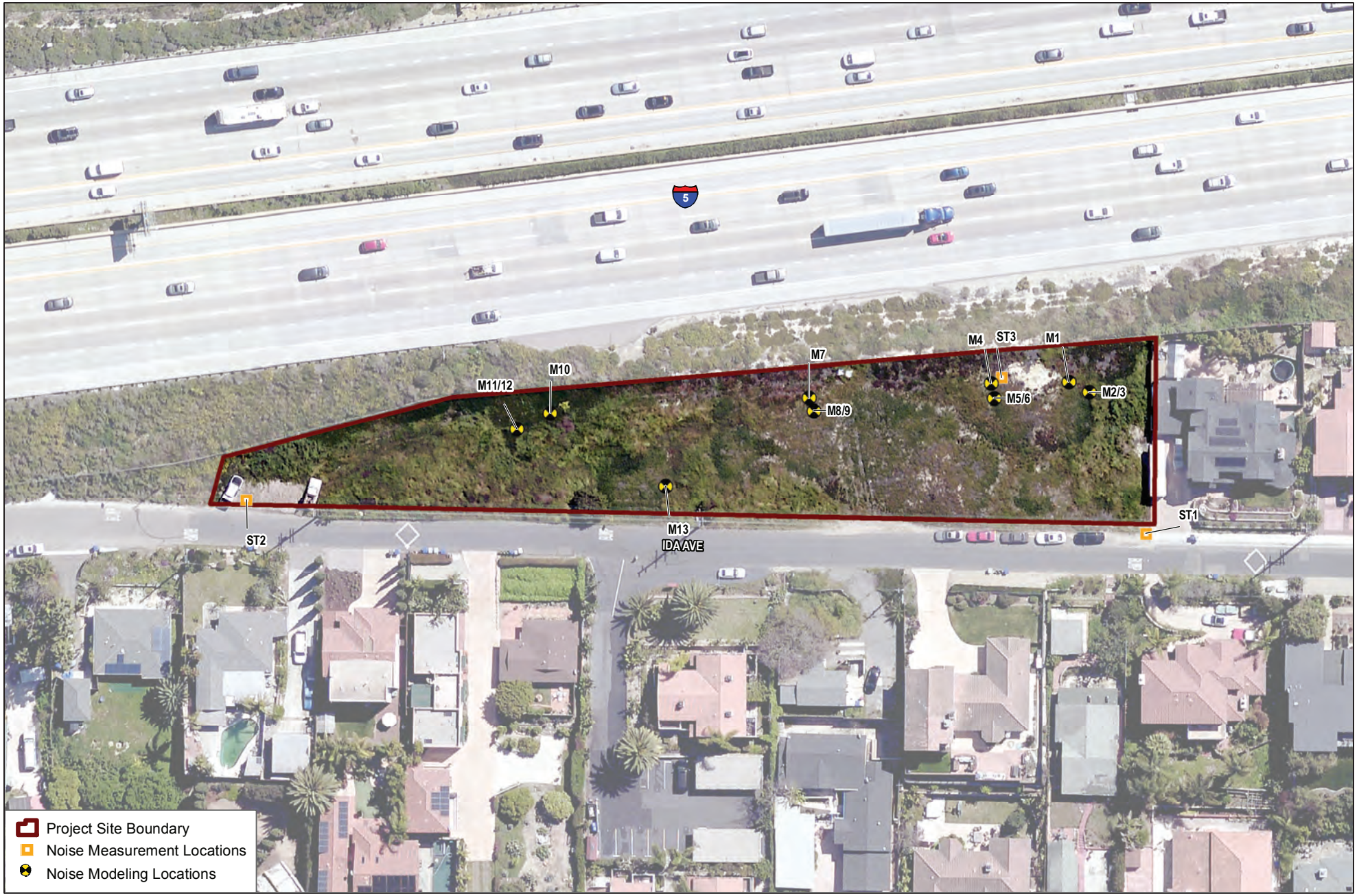
Source: Chereskin Architecture 2019; SANGIS 2017; Dudek 2021

IDA AVENUE APARTMENTS PROJECT

Biological Resources - Impacts

Figure 7

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Michael Baker INTERNATIONAL

File: 178164Figures.indd

0 37.5 75 Feet

Source: DUDEK; SANGIS 2017

IDA AVENUE APARTMENTS PROJECT

Noise Measurement and Modeling Locations

Figure 8

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3.0 ENVIRONMENTAL CHECKLIST

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3.1 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 on the following pages.

☐ 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

3.2 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 EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed Project, nothing further is required.



Signature	Date
	May 20, 2022
Katie Benson	Senior Planner
Printed Name	Title

3.3 EVALUATION OF ENVIRONMENTAL IMPACTS

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources cited. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project- specific factors as well as general standards.

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect, and construction as well as operational impacts.

3) A "Less than Significant Impact" applies when the proposed project would not result in a substantial and adverse change in the environment. This impact level does not require mitigation measures.

4) "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect is significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

5) "Less Than Significant with Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from a "Potentially Significant Impact" to a "Less than Significant Impact." The initial study must describe the mitigation measures and briefly explain how they reduce the effect to a less than significant level.

ENVIRONMENTAL CHECKLIST – SUMMARY

	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less than Significant Impact	No Impact
1. AESTHETICS. 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 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?	☐	☐	☒	☐
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 (DOC) 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 forestland, including the Forest and Range Assessment Project and the Forest Legacy Assessment project, and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board (CARB). Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide or Local Importance (Important Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, or other agricultural resources, 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, forestland (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 forestland or conversion of forestland 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?	☐	☐	☐	☒

	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less than Significant Impact	No Impact
3. AIR QUALITY. Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment 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?	☐	☐	☒	☐
4. BIOLOGICAL RESOURCES. 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 US Fish and Wildlife Service?	☐	☐	☒	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or US 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 wetlands, etc.), through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☒	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐
f) Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less than Significant Impact	No Impact
5. CULTURAL RESOURCES. Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to CEQA Guidelines Section 15064.5?	☐	☒	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5?	☐	☒	☐	☐
c) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐
6. ENERGY. 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?	☐	☐	☒	☐
7. GEOLOGY AND SOILS. 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 projects, and potentially result in on- or off-site landside, 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?	☐	☐	☒	☐

	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less than Significant Impact	No Impact
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐
8. GREENHOUSE GAS EMISSIONS: Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐
9. HAZARDS AND HAZARDOUS MATERIALS. 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 area or, where such a plan has not been adopted, within 2 miles of a public airport or a public use airport, 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?	☐	☐	☒	☐
10. HYDROLOGY AND WATER QUALITY. Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	☐	☐	☒	☐

	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less than Significant Impact	No Impact
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 off-site;	☐	☐	☒	☐
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?	☐	☐	☒	☐
11. LAND USE AND PLANNING. Would the project:				
a) Physically divide an existing 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?	☐	☐	☒	☐
12. MINERAL RESOURCES. 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?	☐	☐	☐	☒
13. NOISE. 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	☐	☒	☐	☐

	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less than Significant Impact	No Impact
general plan or noise ordinance, or of 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 area or, where such a plan has not been adopted, within 2 miles of a public airport or a public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
14. POPULATION AND HOUSING. Would the project:				
a) Induce substantial unplanned population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
15. PUBLIC SERVICES. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:				
a) Fire protection?	☐	☐	☒	☐
b) Police protection?	☐	☐	☒	☐
c) Schools?	☐	☐	☒	☐
d) Parks?	☐	☐	☒	☐
e) Other public facilities?	☐	☐	☒	☐
16. RECREATION				
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?	☐	☐	☒	☐

	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less than Significant Impact	No Impact
17. TRANSPORTATION. Would the project:				
a) Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☒	☐
b) Would the project conflict or be inconsistent with CEQA Guidelines Section 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?	☐	☐	☒	☐
18. TRIBAL CULTURAL RESOURCES. Would the project cause 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, that is:				
a) Listed or eligible for listing in the California Register if Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?; or,	☐	☒	☐	☐
b) 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 3024.1. In applying the criteria set for in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resources to a California Native American tribe?	☐	☒	☐	☐
19. UTILITIES AND SERVICE SYSTEMS. Would the project:				
a) Require or result in the relocation or reconstruction of new or expanded water, wastewater treatment, or storm water drainage, electric power, natural gas, or telecommunication 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 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?	☐	☐	☒	☐

	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less than Significant Impact	No Impact
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☒	☐
20. WILDFIRE. 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?	☐	☐	☒	☐

1. Aesthetics

	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less than Significant Impact	No Impact
I. AESTHETICS. 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 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?	☐	☐	☒	☐

DISCUSSION OF IMPACTS

a) Have a substantial adverse effect on a scenic vista? ***Less than Significant Impact****.*

The project site is a disturbed vacant lot adjacent to I-5. The site is designated Medium-High Residential in the City of Solana Beach General Plan and is zoned for medium-high residential uses. The site lies within an established neighborhood, with adjacent properties to the west and south occupied by residential uses.

The project site is not located within the boundaries of the City's Scenic Area Overlay Zone. Based on Exhibit 4, Scenic Viewpoints and Roadways, of the City of Solana Beach General Plan Conservation and Open Space Element, there are no designated scenic view corridors or scenic roadways within proximity to the project site (City of Solana Beach 2014). The project site is located approximately 0.3 miles northeast of the nearest designated scenic view corridor, which is located along Highland Drive (City of Solana Beach 2014). However, as the views afforded along this corridor are those looking to the southwest (opposite of the direction of the project site), development of the subject property would neither disrupt nor alter existing views from this corridor.

For the reasons above, the project would not have a substantial adverse effect on a scenic vista. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

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

The site does not support any trees, rock outcroppings, or historic buildings. No such resources would be removed with development of the property.

I-5 is identified by Caltrans as an eligible state scenic highway from its intersection with Highway 1 in Orange County south to its intersection with State Route 75 (SR 75) near the Coronado Bridge in San Diego County (Caltrans 2019). However, there are no officially designated state scenic highways within the vicinity of the project site.

Exhibit 4, Scenic Viewpoints and Roadways, of the City's General Plan Conservation and Open Space Element identifies Highway 101, located approximately 0.85 miles west of the project site, as a scenic roadway. The project site is not visible from Highway 101, due to distance and intervening development. As such, the project would not adversely affect or alter views from this roadway.

The project would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway. No impact would occur.

Mitigation Measures: None required.

Level of Significance: No impact.

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 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 City's LUP and the California Coastal Act mandate consideration of aesthetic impacts. The Coastal Act requires that development in the coastal zone be located and designed to minimize the alteration of natural landforms and be visually compatible with the character of surrounding areas, as well as requiring that "scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance." Additionally, "permitted development shall be sited and designed to protect views ... along the ocean, to minimize the alteration of land forms, [and] to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas" (Public Resources Code Section 30251).

The project site is located approximately one mile inland (to the east) of the coastline. Due to the distance from the ocean, combined with intervening development, no views of the Pacific Ocean are afforded from the property. Therefore, no such views would be affected by the project.

As part of the discretionary process, the project applicant was required to install a series of story poles on-site to replicate the location of the proposed buildings and building heights. Installation of the poles was intended to support evaluation of how the project as designed may affect existing views in the area. The story poles were installed on-site in July 2021; a final story pole certification dated October 6, 2021, verified that the maximum building height of the proposed on-site structures would be approximately 24.94 feet above the proposed grade, with the highest pole being 140.03 feet above mean sea level.

As designed, the project proposes to construct in excess of 16 feet in height and therefore requires City approval of a structure development permit. Chapter 17.63 of the City of Solana Beach Municipal Code requires building permit applicants requesting modifications exceeding 16 feet, but not more than 25 feet above existing grade, to notify all property owners and occupants within 300 feet of the subject site. Any person who owns or has lawful possession of a residence from which a view may be impaired by the proposed structures may, within 30 days of the date of notice, file a request for a formal view assessment with the City of Solana Beach.

The City provided formal notification of the discretionary application on March 1, 2022, to all property owners and residents within 300 feet of the project site to invite public comment. The 30-day comment period concluded on March 31, 2022. The project application and plans were also made available at the City of Solana Beach Planning Department for public viewing. As a result, one resident located on the east side of I-5 responded by contacting City staff and cited concerns with the project related to view impairment. However, no official applications requesting a formal view assessment were received by the City during the 30-day comment period, and therefore no such evaluation was required or performed for the project.

Although the project would change the site from an undeveloped to a developed condition, it is not anticipated that views to the site would be adversely affected or degraded. Under the existing Medium-High Residential zone for the site, a maximum of 10 multifamily units are allowed; the project only proposes 8 units, thereby reducing the amount of development that would otherwise be visible on-site, and allowing for approximately 0.7 acres of on-site, undeveloped, common usable open space. Additionally, resident parking would be accommodated on-site via subterranean parking garages, thereby reducing potential views of such activity. The project has also been designed consistent with other requirements of the Municipal Code and with respect for the existing visual character of the surrounding residential neighborhood to further reduce the potential for the project to impair or otherwise affect existing views to the site; refer also to Figure 2B, On-site/Off-site Photographs; Figure 3, Site Plan; Figure 4A, Renderings; and Figure 4B, Elevations, which illustrate the existing setting and the proposed improvements.

Based on the above discussion, development of the site as proposed is not anticipated to conflict with applicable zoning and other regulations governing scenic quality. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area? ***Less than Significant Impact****.*

Section 17.60.060, Exterior Lighting Regulations (Dark Sky Overlay), of the City's Municipal Code provides exterior lighting regulations aimed at controlling excessive or unnecessary outdoor light emissions that produce unwanted illumination of adjacent premises within the City. The zone also prescribes standards for the maintenance or "dark sky" neighborhoods as identified in the City's General Plan.

The project site is not located within an area designated as a "dark sky" neighborhood. Under current conditions, lighting and glare sources in the project area are surrounding residential uses, as well as vehicles traveling along I-5, which runs adjacent to the east of the property.

A lighting plan (see Figure 6, Lighting Plan) was prepared for the project to ensure consistency with the City's Municipal Code regulations pertaining to light and glare. The project proposes incorporation of exterior lighting fixtures to ensure resident safety, as well as to aid in access and on-site circulation. All project lighting would be low voltage, shielded, and directed downward to minimize potential glare or lighting effects on adjacent properties, consistent with the City's Exterior Lighting Regulations (Section 17.60.060 of the Municipal Code). 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. Impacts would be less than significant in this regard.

Mitigation Measures: None required.

Level of Significance: Less than significant.

2. Agriculture and Forestry Resources

	Potentially Significant Impact	Less than Significant Impact With Mitigation	Less than Significant Impact	No Impact
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 (DOC) 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 forestland, including the Forest and Range Assessment Project and the Forest Legacy Assessment project, and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board (CARB). Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide or Local Importance (Important Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, or other agricultural resources, 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, forestland (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 forestland or conversion of forestland to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

DISCUSSION OF IMPACTS

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use? ***No Impact.***

Pursuant to the current California Department of Conservation's (DOC) Important Farmland Map for San Diego County, the project site is identified as urban land and built-up land, which is land that is occupied by structures with a building density of at least 1 unit to 1.5 acres and is intended for uses including, but not limited to, residential, industrial, commercial, construction, institutional, and other developed purposes (DOC 2020). No lands designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance are present on-site. Therefore, the project would not impact designated farmland or result in farmland conversion to non-agricultural use. No impact would occur.

Mitigation Measures: None required.

Level of Significance: No impact.

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract? ***No Impact.***

The project would not conflict with existing designations or zoning for agricultural uses in the City of Solana Beach General Plan. The project site is currently zoned Medium-High Residential. Adjacent lands to the south and northwest are similarly zoned Medium-High Residential; lands to the west are zoned Medium Residential. As such, neither the project site nor surrounding properties are intended for agricultural use, nor do they support designated farmland. Refer also to Figure 2A, Aerial Photograph. Additionally, neither the project site nor any adjacent lands are subject to a Williamson Act agricultural preserve. No such lands would be affected by the proposed development.

The project would not have an impact with regard to zoning for agricultural use or a Williamson Act contract. No impact would occur.

Mitigation Measures: None required.

Level of Significance: No impact.

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))? ***No Impact.***

As indicated in the Land Use Element of the City's General Plan, the City does not contain any land suitable for timber production and does not contain any parcels of real property zoned for timberland production (City of Solana Beach 2014). The project site is zoned for Medium-High Residential development; no lands designated as forestland or timberland are present on-site or adjacent to the property. Project implementation would therefore not conflict with existing zoning for, or cause rezoning of, any forestland or timberland. No impact would occur in this regard.

Mitigation Measures: None required.

Level of Significance: No impact.

d) Result in the loss of forest land or conversion of forest land to non-forest use? ***No Impact.***

The vacant site is zoned for Medium-High Residential development and is currently undeveloped; no designated forestland is present on-site. Project implementation would therefore not result in the conversion of forestland to non-forest use. No impact would occur in this regard.

Mitigation Measures: None required.

Level of Significance: No impact.

e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use? ***No Impact.***

The subject property is not identified as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance on the most recent maps of the DOC's Farmland Mapping and Monitoring

Program. The project site is not located in an area designated as forestland or timberland and is not currently in active agricultural use or under a Williamson Act contract, nor are any such conditions present on lands in the project vicinity.

The project proposes future development of the site with multifamily uses (apartments), generally similar to the (single-family) residential use types that currently surround the site to the west and south. Development of the site as proposed would therefore not 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 forestland to non-forest use. No impact would occur in this regard.

Mitigation Measures: None required.

Level of Significance: No impact.

3. Air Quality

	Potentially Significant Impact	Less than Significant Impact With Mitigation	Less than Significant Impact	No Impact
3. AIR QUALITY. Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment 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 evaluation is based upon the *Air Quality and Greenhouse Gas Emissions Analysis Technical Report* prepared by Dudek (2021a; see Appendix A).

DISCUSSION OF IMPACTS

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

The San Diego Air Pollution Control District (SDAPCD) and San Diego Association of Governments (SANDAG) are responsible for developing and implementing the clean air plans for attainment and maintenance of the ambient air quality standards in the San Diego air basin - specifically, the State Implementation Plan (SIP) and Regional Air Quality Strategy (RAQS).[1] The federal O_3 (ozone) maintenance plan, which is part of the SIP, was adopted in 2012; the most recent O_3 attainment plan was adopted in 2016. The SIP includes a demonstration that current strategies will maintain acceptable air quality in the basin based on the National Ambient Air Quality Standards (NAAQS). The RAQS was initially adopted in 1991 and is updated on a triennial basis (most recently in 2016).

The RAQS outlines SDAPCD's plans and control measures designed to attain the state air quality standards for O_3. The SIP and RAQS rely on information from the California Air Resources Board (CARB) and SANDAG, including mobile and area source emissions as well as information regarding projected growth in San Diego County as a whole and cities within the County to project future emissions and determine the strategies necessary for the reduction of emissions through regulatory controls. CARB mobile source emission projections and SANDAG growth projections are based on population, vehicle trends, and land use plans developed by the County and cities within the County in developing their general plans. If a project involves development that is greater than that anticipated in the local plan and SANDAG's growth projections, the project may

[1] The relevant federal air quality plan is the ozone maintenance plan (Dudek 2021a). The RAQS is the applicable plan for purposes of state air quality planning. Both plans reflect growth projections in the basin.

potentially conflict with the SIP and RAQS and may contribute to a potentially significant cumulative impact on air quality.

The project site is designated as Medium-High Residential 8–12 dwelling units per acre in the City's General Plan and is zoned for Medium-High Residential use. The project proposes development of 8 multi-family residential dwelling units on 0.94 acres (project grading would total 1.44 acres, which includes 0.94 acres on-site and 0.5 acres off-site). Thus, the project would be in conformance with the existing zoning and land use designations and no changes are required to allow for the development as proposed. The development is therefore considered consistent with future growth as anticipated by the General Plan and SANDAG growth projections. Further, SANDAG's Regional Plan population, employee population, and housing estimates for the years 2020 and 2035 were compared to the estimated increase in population, employees, and housing generated by the project. The project is considered to be consistent with such estimates (Dudek 2021a).

The project would therefore not conflict with or obstruct implementation of the applicable air quality plan. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

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? ***Less than Significant Impact.***

Construction Emissions

Project construction would result in the temporary addition of pollutants to the local airshed caused by on-site sources (e.g., off-road construction equipment, rock crushing, soil disturbance, and off-gassing) and off-site sources (i.e., on-road haul trucks, vendor trucks, and worker vehicle trips). Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and for dust, the prevailing weather conditions. Therefore, such emission levels were approximately estimated for the project with a corresponding uncertainty in precise ambient air quality impacts.

Criteria air pollutant emissions associated with temporary construction activity were quantified using the California Emissions Estimator Model (CalEEMod). Project construction emissions were calculated for the estimated worst-case day over the construction period associated with each phase and reported as the maximum daily emissions estimated during each year of construction. Default values provided in CalEEMod were used where detailed project information was not available (Dudek 2021a).

The project would generate air pollutant emissions from entrained dust, off-road equipment, vehicle emissions, architectural coatings, and asphalt pavement application. Entrained dust results from the exposure of earth surfaces to wind from the direct disturbance and movement of soil, resulting in particulate matter (PM_{10} and $PM_{2.5}$)[2] emissions. The project would implement various dust control strategies and would be required to comply with San Diego Air Pollution Control District (SDAPCD) Rule 55 to control dust emissions generated during, but not limited to,

[2] PM_{10} = particulate matter with an aerodynamic diameter less than or equal to 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter less than or equal to 2.5 microns.

project ground disturbing activities. Construction practices that would be employed to reduce fugitive dust emissions include watering of the active sites and unpaved roads at least two times per day depending on weather conditions; restricting vehicle speed on unpaved roads to 15 miles per hour; halting grading and excavation operations when wind speeds exceed 25 miles per hour; clean-up and disposal of dirt and debris spilled onto paved surfaces at the project site and on adjacent roadways at the end of each workday; and, covering all haul trucks to and from the construction site and/or maintaining a minimum two feet of freeboard. Such measures would be made Conditions of Approval for the project.

Internal combustion engines used by construction equipment, vendor trucks (i.e., delivery trucks), and worker vehicles would result in emissions of volatile organic compounds (VOCs), oxides of nitrogen (NOx), carbon monoxide (CO), PM_{10}, and $PM_{2.5}$. The application of architectural coatings, such as exterior application/interior paint and other finishes, and application of asphalt pavement would also produce VOC emissions. The contractor would be required to use low-VOC paints for the interior and exterior of the residential buildings to meet the VOC limits specified (content of 5 grams per liter or less for interior and 50 grams per liter or less for exterior). To ensure that emissions are minimized during the construction period, such measures would be made Conditions of Approval for the project.

Table 3-1 presents the estimated maximum daily construction emissions generated during project construction. The values shown are the maximum summer or winter daily emissions results from CalEEMod. Details of the emission calculations are provided in Appendix A of Appendix A.

Table 3-1. Estimated Maximum Daily Construction Criteria Air Pollutant Emissions

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	pounds per day					
2021	3.42	85.45	24.86	0.23	7.08	3.05
2022	2.40	12.72	13.00	0.02	0.66	0.59
Maximum	3.42	85.45	24.86	0.23	7.08	3.05
SDAPCD Threshold	75	250	550	250	100	55
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Source: Dudek 2021a;See Appendix A.
Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SDAPCD = San Diego Air Pollution Control District.
The values shown are the maximum summer or winter daily emissions results from CalEEMod. These emissions reflect CalEEMod "mitigated" output, which accounts for compliance with low-VOC paints and implementation of the project's fugitive dust control strategies, including watering of the project site and unpaved roads two times per day, restricting vehicle speed on unpaved roads to 15 miles per hour, and removing dirt and debris spilled onto paved surfaces at the project site and on adjacent roadways.

As shown in Table 3-1, daily construction emissions would not exceed the SDAPCD significance thresholds for VOC, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$ during construction in all construction years. As stated above, to ensure that project construction emissions remain below the adopted thresholds, standard measures would be implemented. Further, project construction-generated emissions would be temporary and would not represent a long-term source of criteria air pollutant emissions. Impacts would be less than significant.

Operational Emissions

Operation of the proposed residential land use would generate VOC, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$ emissions from mobile sources, area sources, consumer products, architectural coatings for repainting, landscape maintenance equipment, and energy sources, including combustion of fuels used for space and water heating and cooking appliances.

Pollutant emissions associated with long-term project operations were quantified using CalEEMod. Project-generated mobile source emissions were estimated in CalEEMod based on project-specific trip rates. CalEEMod default values were used to estimate emissions from the project area and energy sources (Dudek 2021a).

Table 3-2 presents the maximum daily area, energy, and mobile source emissions associated with project operation. The values shown are the maximum summer or winter daily emissions results from CalEEMod and are compared to the SDAPCD thresholds of significance. Details of the emission calculations are provided in Appendix A of Appendix A.

Table 3-2. Estimated Maximum Daily Operational Criteria Air Pollutant Emissions

Emission Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	pounds per day					
Area	0.20	<0.01	0.66	<0.01	<0.01	<0.01
Energy	<0.01	0.02	<0.01	<0.01	<0.01	<0.01
Mobile	0.08	0.30	0.95	<0.01	0.32	0.09
Total	**0.28**	**0.32**	**1.62**	**<0.01**	**0.32**	**0.09**
SDAPCD Threshold	*75*	*250*	*550*	*250*	*100*	*55*
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Source: Dudek 2021a; see Appendix A.
Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SDAPCD = San Diego Air Pollution Control District; <0.01 = reported emissions are less than 0.01.
Totals may not sum due to rounding.
Residential units were not equipped with fireplaces or woodstoves. Low-VOC paints were assumed for re-application.
The values shown are the maximum summer or winter daily emissions results from CalEEMod. These emissions reflect operational year 2023.

As shown in Table 3-2, the combined daily area, energy, and mobile source emissions would not exceed the SDAPCD operational thresholds for VOC, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$. Thus, impacts associated with project-generated operational criteria air pollutant emissions would be less than significant.

Air pollution is largely a cumulative impact. The nonattainment status of regional pollutants is a result of past and present development, and SDAPCD develops and implements plans for future attainment of ambient air quality standards. Based on these considerations, project-level thresholds of significance for criteria pollutants are relevant in the determination of whether a project's individual emissions would have a cumulatively significant impact on air quality. As described above, the project would have a less than significant impact for short-term construction and long-term operations.

The San Diego Air Basin (SDAB) is a nonattainment area for O_3 under the NAAQS and California Ambient Air Quality Standards (CAAQS). Poor air quality in the SDAB is the result of cumulative emissions from motor vehicles, off-road equipment, commercial and industrial facilities, and

other emission sources. Projects that emit these pollutants or their precursors (e.g., VOCs and NO_x for O_3) potentially contribute to poor air quality.

In analyzing cumulative impacts from a project, the analysis must specifically evaluate the project's contribution to the cumulative increase in pollutants for which the SDAB is designated as nonattainment for the CAAQS and NAAQS. If the project does not exceed thresholds and is determined to have less than significant project-related impacts, it may still contribute to a significant cumulative impact on air quality if the emissions, in combination with the emissions from other proposed or reasonably foreseeable future projects, are in excess of established thresholds. However, a project would only be considered to have a significant cumulative impact if the project's contribution accounts for a significant proportion of the cumulative total emissions (e.g., it represents a "cumulatively considerable contribution" to the cumulative air quality impact).

Additionally, for the basin, the RAQS serves as the long-term regional air quality planning document for the purpose of assessing cumulative operational emissions in the basin to ensure the SDAB continues to make progress toward NAAQS and CAAQS attainment status. As such, cumulative projects located in the San Diego region would have the potential to result in a cumulative impact to air quality if, in combination, they would conflict with or obstruct implementation of the RAQS. Similarly, individual projects that are inconsistent with the regional planning documents upon which the RAQS is based would have the potential to result in cumulative operational impacts if they represent development and population increases beyond regional projections.

The SDAB has been designated as a federal nonattainment area for O_3 and a state nonattainment area for O_3, PM_{10}, and $PM_{2.5}$. The nonattainment status is the result of cumulative emissions from all sources of these air pollutants and their precursors within the SDAB. As discussed under Response 3a), above, the project would not exceed significance thresholds during construction or operation. As such, the project would result in a less than significant air quality impact relative to operational emissions.

Regarding long-term cumulative operational emissions in relation to consistency with local air quality plans, the SIP and RAQS serve as the primary air quality planning documents for the state and SDAB, respectively. The SIP and RAQS rely on SANDAG growth projections based on population, vehicle trends, and land use plans developed by the cities and the County as part of the development of their general plans. Therefore, projects that involve development consistent with the growth anticipated by local plans would be consistent with the SIP and RAQS and would not be considered to result in cumulatively considerable impacts from operational emissions. The project would be consistent with the current General Plan and zoning designations that apply to the site and would not result in significant regional growth that is not accounted for within the RAQS. As a result, the project would not result in a cumulatively considerable contribution to regional O_3 concentrations or other criteria pollutant emissions. Cumulative impacts in this regard would be less than significant during operation.

Mitigation Measures: None required.

Level of Significance: Less than significant.

c) Expose sensitive receptors to substantial pollutant concentrations? ***Less than Significant Impact.***

Air quality varies as a direct function of the amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. Air quality problems arise when the rate of pollutant emissions exceeds the rate of dispersion. Reduced visibility, eye irritation, and adverse health impacts upon those persons termed sensitive receptors are the most serious hazards of existing air quality conditions in the area. Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. Sensitive receptors include residences, schools, playgrounds, child-care centers, athletic facilities, long-term health-care facilities, rehabilitation centers, convalescent centers, and retirement homes. The closest sensitive receptors (residences) are located adjacent to the south boundary and across Ida Avenue to the west of the project site.

Health Impacts of Toxic Air Contaminants (TAC)

"Incremental cancer risk" is the net increased likelihood that a person continuously exposed to concentrations of TACs resulting from a project over a 9-, 30-, and 70-year exposure period would contract cancer based on the use of standard Office of Environmental Health Hazard Assessment risk-assessment methodology (Dudek 2021a). In addition, some TACs have noncarcinogenic effects. TACs that would potentially be emitted during project construction activities would be diesel particulate matter (DPM) emitted from heavy-duty construction equipment and heavy-duty trucks. The project would not require the extensive use of heavy-duty construction equipment, which is subject to California Air Resources Board (CARB) Airborne Toxic Control Measures to reduce DPM emissions. According to the Office of Environmental Health Hazard Assessment, health risk assessments should be based on a 30-year exposure duration based on typical residency period; however, such assessments should be limited to the period/duration of activities associated with the project (Dudek 2021a). Thus, the duration of proposed construction activities (approximately 11 months) would only constitute a small percentage of the total long-term exposure period and would not result in exposure of proximate sensitive receptors to substantial TACs.

After construction is completed, there would be no long-term source of TAC emissions during project operations. No residual TAC emissions and corresponding cancer risk are anticipated after construction, and no long-term sources of TAC emissions are anticipated during operation of the project. Project implementation would not expose sensitive receptors to substantial TAC concentrations. Impacts would be less than significant.

Valley Fever

Valley fever (Coccidioidomycosis) is not highly endemic to San Diego County and incident rates for the County within the project area are below the County average, as well as the statewide average (Dudek 2021a). The project would be consistent with SDAPCD Rule 55 which limits the amount of fugitive dust generated during construction and would control the release of the Coccidioides immitis fungus from construction activities by watering exposed areas (i.e., during grading) twice per day and limiting speeds on any unpaved roads to 15 miles per hour.

The closest sensitive receptors (residential uses) are located adjacent to the western and southern site boundaries. Based on the low incidence rate of Coccidioidomycosis in the project area and in greater San Diego County, and the project's implementation of dust control strategies, it is not anticipated that earth-moving activities during project construction would result in exposure of

nearby sensitive receptors to valley fever. Therefore, the project would have a less than significant impact with respect exposure of sensitive receptors to valley fever.

Health Impacts of Carbon Monoxide

The trip generation analysis (LL&G 2021) determined that the project would generate fewer than 1,000 average daily trips (ADT) or fewer than 100 peak hour trips; thus, a traffic impact study was not required. Furthermore, the project would generate 48 ADT (6 trips per unit), which is not anticipated to generate significant daily or peak hour traffic. Project operation would therefore not exceed the screening threshold, would not result in a CO hotspot or have the potential to result in CO emissions that when totaled with the ambient concentrations would exceed a 1-hour concentration of 20 parts per million or an 8-hour average of 9 parts per million. Impacts in this regard would be less than significant.

Health Effects of Other Criteria Air Pollutants

Project construction and operation would not exceed SDAPCD thresholds for VOC, NO_x, CO, SO_x, $PM_{10,}$ or $PM_{2.5}$. Table 3-3 presents a list of the criteria pollutants and other related pollutants of concern, emission sources, associated health effects, and current SDAB attainment status.

Table 3-3. Pollutants, Sources, Health Effects, and Attainment Status

Pollutant	Sources	Health Effects	Attainment Status	
			NAAQS	CAAQS
O_3	Formed when VOCs and NO_x react in the presence of sunlight. VOC sources include any source that burns fuels (e.g., gasoline, natural gas, wood, oil); solvents; petroleum processing and storage.	Breathing difficulties, lung tissue damage, vegetation damage, damage to rubber and some plastics.	Nonattainment	Nonattainment
PM_{10}	Road dust, windblown dust, agriculture and construction, fireplaces. Also formed from other pollutants (NO_x, SO_x, organics). Incomplete combustion.	Increased respiratory disease, lung damage, cancer, premature death, reduced visibility, surface soiling.	Unclassifiable/ Attainment	Nonattainment
$PM_{2.5}$	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning. Also formed from reaction of other pollutants (NO_x, SO_x, organics, and NH_3).	Increases respiratory disease, lung damage, cancer, and premature death, reduced visibility, surface soiling. Particles can aggravate heart diseases such as congestive heart failure and coronary artery disease.	Unclassifiable/ Attainment	Nonattainment
CO	Any source that burns fuel such as automobiles, trucks, heavy construction and farming equipment, residential heating.	Chest pain in heart patients, headaches, reduced mental alertness.	Attainment	Attainment

Table 3-3, continued

Pollutant	Sources	Health Effects	Attainment Status	
			NAAQS	CAAQS
NO_2	See carbon monoxide.	Lung irritation and damage. Reacts in the atmosphere to form ozone and acid rain.	Unclassifiable/ Attainment	Attainment
Lead	Metal smelters, resource recovery, leaded gasoline, deterioration of lead paint.	Learning disabilities, brain and kidney damage.	Unclassifiable/ Attainment	Attainment
SO_2	Coal or oil burning power plants and industries, refineries, diesel engines.	Increases lung disease and breathing problems for asthmatics. Reacts in the atmosphere to form acid rain.	Unclassifiable/ Attainment	Attainment
Sulfates	Produced by reaction in the air of SO_2, (see SO_2 sources), a component of acid rain.	Breathing difficulties aggravates asthma, reduced visibility.	(no federal standard)	Attainment
Hydrogen Sulfide	Geothermal power plants, petroleum production and refining, sewer gas.	Nuisance odor (rotten egg smell), headache and breathing difficulties (higher concentrations).	(no federal standard)	Unclassified
Visibly Reducing Particles	See $PM_{2.5}$	Reduced visibility (e.g., obscures mountains and other scenery), reduced airport safety.	(no federal standard)	Unclassified
Vinyl Chloride	Exhaust gases from factories that manufacture or process vinyl chloride (construction, packaging, and transportation industries)	Central nervous system effects (e.g., dizziness, drowsiness, headaches), kidney irritation, liver damage, liver cancer.	N/A	N/A

Source: Dudek 2021a: see Appendix A.
Notes: O_3 = ozone; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; CO = carbon monoxide; NO_2 = nitrogen dioxide; SO_2 = sulfur dioxide.

VOCs and NO_x are precursors to O_3, for which the SDAB is designated as nonattainment with respect to the NAAQS and CAAQS. The health effects associated with O_3 are generally associated with reduced lung function. The contribution of VOCs and NO_x to regional ambient O_3 concentrations is the result of complex photochemistry. The increases in O_3 concentrations in the SDAB due to O_3 precursor emissions tend to be found downwind from the source location to allow time for the photochemical reactions to occur. However, the potential for exacerbating excessive O_3 concentrations would also depend on the time of year that the VOC emissions would occur because exceedances of the O_3 CAAQS/NAAQS tend to occur between April and October when solar radiation is highest. Due to the lack of quantitative methods to assess this complex photochemistry, the holistic effect of a single project's emissions of O_3 precursors is speculative. Construction and operation of the project would not exceed SDAPCD thresholds for VOC and NO_x; thus, project implementation would not contribute significant health effects associated with O_3. SDAPCD Rule 67.0.1 restricts the VOC content of coatings for both construction and operational applications. Furthermore, the project would utilize low-VOC paints.

Health effects associated with NO_x include lung irritation and enhanced allergic responses (Dudek 2021a). Construction of the project would not contribute to exceedances of the NAAQS and CAAQS for NO_2. Health effects that result from NO_2 and NO_x include respiratory irritation, which could be experienced by nearby receptors during the periods of heaviest use of off-road construction equipment. Project construction would be relatively short-term, and off-road construction equipment would be operating at various portions of the site and would not be concentrated in one portion of the site at any one time. In addition, existing NO_2 concentrations in the area are well below the NAAQS and CAAQS standards. Operation of the project would not require use of any stationary sources (e.g., diesel generators and boilers) that would create substantial, localized NO_x impacts.

Health effects associated with CO include chest pain in patients with heart disease, headache, light-headedness, and reduced mental alertness (Dudek 2021a). CO tends to be a localized impact associated with congested intersections. The associated potential for CO hotspots was discussed previously and is determined to be a less-than-significant impact. Thus, the project's CO emissions would not contribute to significant health effects associated with this pollutant.

Health effects associated with PM_{10} include premature death and hospitalization, primarily for worsening of respiratory disease (Dudek 2021a). Construction and operation of the project would also not exceed thresholds for PM_{10} or $PM_{2.5}$ and would not contribute to exceedances of the NAAQS and CAAQS for particulate matter or obstruct the SDAB from coming into attainment for these pollutants. The project would also not result in substantial DPM emissions during construction and operation, and therefore would not result in significant health effects related to DPM exposure. Additionally, the project would implement dust control strategies and be required to comply with SDAPCD Rule 55, which limits the amount of fugitive dust generated during construction. The incorporation of wood burning stoves or natural gas fireplaces would also be prohibited to avoid such sources of PM_{10} and $PM_{2.5}$. Adherence to such strategies and restrictions would be ensured as part of the Conditions of Approval for the project. Due to the minimal contribution of particulate matter during construction and operation, the project is not anticipated to result in health effects associated with PM_{10} or $PM_{2.5}$.

The project would not expose sensitive receptors to substantial pollutant concentrations. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people? ***Less than Significant Impact.***

The State of California Health and Safety Code, Division 26, Part 4, Chapter 3, Section 41700 SDAPCD Rule 51 prohibits emissions from any source in such quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to the public health or damage to property. Projects required to obtain permits from SDAPCD are evaluated by SDAPCD for potential odor nuisance, and conditions may be applied (or control equipment required) where necessary to prevent the occurrence of public nuisance. SDAPCD Rule 51 (Public Nuisance) also prohibits emission of any material that causes nuisance to a considerable number of persons or endangers the comfort, health, or safety of any person (Dudek 2021a). A project that involves

a use that would produce objectionable odors would be deemed to have a significant odor impact if it would affect a considerable number of off-site receptors.

The occurrence and severity of potential odor impacts is influenced by various factors such as the nature, frequency, and intensity of the source; wind speed and direction; and sensitivity of the receiver. Odor issues are subjective by the nature of odors themselves and due to the fact that measurement is difficult to quantify.

During project construction, odors could be potentially generated from vehicles and equipment exhaust emissions. Such odors would be attributable to concentrations of unburned hydrocarbons from tailpipes of construction equipment, architectural coatings, and asphalt pavement application. However, any such odors would disperse rapidly from the project site and generally occur at a level that would not affect substantial numbers of people.

Land uses and industrial operations typically associated with odor complaints include agricultural uses, wastewater treatment plants, food-processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding facilities. The project proposes residential development which is not commonly associated with odors. Therefore, project operations would not result in odor emissions that would affect a substantial number of people.

The project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

4. Biological Resources

	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less than Significant Impact	No Impact
4. BIOLOGICAL RESOURCES. 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 US Fish and Wildlife Service?	☐	☐	☒	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or US 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 wetlands, etc.), through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☒	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐
f) Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

DISCUSSION OF IMPACTS

The following evaluation is based upon the *Assessment of Biological Resources for the Ida Avenue Project* (Dudek 2021b), included as Appendix B of the IS/MND.

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 US Fish and Wildlife Service? ***Less than Significant Impact.***

The project site was reviewed for applicability of the City's Environmentally Sensitive Habitat Areas (ESHA) policies. Because the site is located in the coastal zone, the California Coastal Commission requires compliance with the California Coastal Act through the City's approved LCP/LUP (City of Solana Beach 2013). ESHAs are identified and defined by the City of Solana Beach LCP as any plant or animal species, including their associated habitats, that are considered rare or

especially valuable (City of Solana Beach 2014). Sensitive vegetation communities within the City of Solana Beach, as identified in the City's LCP, include southern coastal salt marsh, freshwater marsh, southern willow scrub, mulefat scrub, open water/estuarine, beach, southern coastal bluff scrub, southern maritime chaparral, Diegan coastal sage scrub, southern mixed chaparral, coastal sage-chaparral scrub, and non-native grassland (Dudek 2021b). Based on the results of the biological survey and habitat mapping conducted, vegetation within the off-site Caltrans ROW (disturbed Diegan coastal sage scrub) does not meet ESHA criteria. Furthermore, the City of Solana Beach's LCP did not map any of the disturbed habitat on the project site as ESHA. As such, the project site was determined not to be subject to the ESHA protection policies, and no buffers are required (Dudek 2021b).

Under current conditions, lands classified as developed land occur in the small parking area immediately adjacent to Ida Avenue in the northern portion of the site. Disturbed habitat is present throughout the majority of the site, but predominantly west of the chain-link fence that runs through the eastern portion of the property. The most common non-native vegetation species on-site include ice plant, Russian thistle, and *Acacia* sp (Dudek 2021b).

The on-site vegetation/land cover is highly disturbed and does not qualify as ESHA; the site is not identified as ESHA in the LCP/LUP. The subject site is small, contains no native vegetation, and does not contain special-status species. No observable biological resources, including perennial plants commonly accepted as regionally sensitive by the California Department of Fish and Wildlife, US Fish and Wildlife Service, and the City, were identified during the site visit (Dudek 2021b).

On-site, approximately 0.92 acres of disturbed habitat and 0.02 acres of urban/developed landcover would be cleared and graded for the construction of the apartment complex building in the southern portion of the site and associated landscaping in the northern portion. Off-site, approximately 0.15 acres of manufactured, hydroseeded, disturbed Diegan coastal sage scrub within the Caltrans ROW would be graded, cleared, and brought up to finished grade. Such impacts would be temporary as the area would be restored/hydroseeded with a native seed mix to pre-project conditions at project completion. Other off-site impacts would occur to 0.01 acres of disturbed habitat, as well as to an additional 0.01 acres of disturbed habitat within the Caltrans ROW. There would also be temporary impacts to 0.33 acres of urban/developed land (Dudek 2021b). All off-site impact areas would be restored to original condition upon completion of project construction. Refer also to Figure 7, Biological Resources - Impacts. The project would therefore not result in impacts to sensitive resources that require mitigation.

Due to existing conditions, the project as proposed 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 or US Fish and Wildlife Service. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

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

Sensitive habitats include those that are of special concern to resource agencies and those that are protected under CEQA, Fish and Game Code Section 1600, and Section 404 of the Clean Water Act. No waters of the state or waters of the United States occur within the project site.

Refer to Response 4(a), above. Based on the results of the biological survey and habitat mapping conducted, vegetation affected by the proposed improvements does not meet the City's ESHA criteria. The project site was therefore determined not to be subject to the ESHA protection policies. The site is highly disturbed and habitat is characterized as disturbed and/or developed, with limited disturbed Diegan coastal sage scrub occurring within the Caltrans ROW. Such habitats have limited ecological value. Therefore, the project would not adversely affect any riparian habitat or other sensitive natural community. No impact would occur in this regard.

Mitigation Measures: None required.

Level of Significance: No impact.

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

Project implementation would not result in the loss of jurisdictional waters of the state or of the United States as no such resources are present within the project boundaries. As stated, the site supports habitat classified as developed and disturbed habitat. As a result, no impact to state or federally protected wetlands would occur.

Mitigation Measures: None required.

Level of Significance: No impact.

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? ***Less than Significant Impact with Mitigation Incorporated.***

Native bird species and their nests are protected under the Migratory Bird Treaty Act (MBTA) of 1918 (16 United States Code 703-712). The MBTA implements international treaties between the United States and other nations devised to protect migratory birds, their parts, eggs, and nests from activities such as hunting, pursuing, capturing, killing, selling, and shipping, unless expressly authorized in the regulations or by permit. The State of California has incorporated the protection of birds of prey in Sections 3800, 3513, and 3503.5 of the California Fish and Game Code (FGC). All raptors and their nests are protected from take or disturbance under the MBTA (16 USC Section 703 et seq.) and California statute (FGC Section 3503.5).

No native wildlife nursery sites are present on or near the property, and no established migratory routes, wildlife corridors, or linkages were identified on-site or in the vicinity. Additionally, I-5 borders the site to the east and supports substantial daily traffic volumes and associated vehicle noise that may discourage wildlife species from traveling through the area. Although some wildlife may move locally through the area, the site is generally restricted by surrounding development and the I-5 freeway. As the proposed improvements are of a limited scale and would occur

adjacent to developed lands, the project would not introduce a new barrier that would restrict or adversely affect wildlife movement.

Potential nesting habitat within the project area is limited to birds that nest on the ground and in open, sparsely vegetated habitat. The project area provides limited foraging habitat for migratory bird species and raptors. Lands buffering the project site to the west and south support ornamental, landscaped trees and shrubs that could potentially provide nesting habitat for migratory bird species and, in some locations, for raptors; however, they are situated adjacent to highly trafficked areas (i.e., roads and structures). Therefore, raptor species are not expected to use these trees for nesting, nor anticipated to be directly affected by project construction activities. Disturbed areas within lands buffering the project site to the east (Caltrans ROW) appear to be consistently maintained or contain limited vegetation; therefore, foraging habitat is of low quality for raptors. Additionally, no nests were observed within the survey area during the field survey (Dudek 2021b).

Although no nesting birds were identified during the field survey, conditions could change by the time project construction activities begin. Vegetation could grow on-site or on adjacent lands to the east and, if not maintained, could provide nesting habitat for ground dwelling/sparse shrub nesting birds. Direct and/or indirect impacts may occur during project construction if a nest is physically disturbed or destroyed, or if breeding or nesting activities are disrupted or cease due to noise or increased human activity. Mitigation measure BIO-1 is therefore proposed to ensure that direct and indirect impacts to migratory species would be reduced to less than significant.

Mitigation Measure:

BIO-1 **Compliance with Migratory Bird Treaty Act.** If construction activities (e.g., staging, site preparation, grading) commence during the breeding season (January 1 through July 31 for raptors and March 1 through September 15 for songbirds), a preconstruction nesting bird survey shall be conducted by a qualified biologist. The survey shall be performed within three days prior to the commencement of construction activities. Surveys shall include the construction area plus a 500-foot buffer. Survey findings would be documented prior to initiating any construction activities.

If no nesting birds are observed during the survey, implementation of project activities may begin. If nesting birds (including nesting raptors) are found to be present, avoidance or minimization measures shall be undertaken. Measures shall include establishment of an avoidance buffer until nesting has been completed. The width of the buffer will be determined by the qualified biologist based on California Department of Fish and Wildlife recommendations. The qualified biologist shall determine the appropriate buffer size and level of nest monitoring necessary for species not listed under the federal or California Endangered Species Acts based on the species' life history, the species' sensitivity to disturbances (e.g., noise, vibration, human activity), individual behavior, status of nest, location of nest and site conditions, presence of screening vegetation, anticipated project activities, ambient noise levels compared to project-related noise levels, existing non-project-related disturbances in the vicinity, and ambient levels of human activity.

Buffers shall be marked (flagged or fenced with environmentally sensitive area fencing) around any active nests and periodic monitoring by the qualified biologist will occur to ensure the project does not result in the failure of the nest. The buffer(s) shall be maintained around each nest until the nest becomes inactive as determined by the qualified biologist. At the discretion of the

qualified biologist, if a nesting bird appears to be stressed as a result of project activities and the buffer does not appear to provide adequate protection, additional minimization measures may need to be implemented.

Construction may continue outside of the no-work buffers. The qualified biologist shall ensure that restricted activities occur outside of the delineated buffers, check nesting birds for any potential indications of stress, and ensure that installed fencing or flagging is properly maintained during nest monitoring and any additional site visits. Buffer sizes may be adjusted (either increased or reduced), or the extent of nest monitoring may be adjusted, at the discretion of the qualified biologist based on the conditions of the surrounding area and/or the behavior of the nesting bird.

Any changes to buffer sizes and/or nest monitoring frequency shall be documented. If listed species are found to be nesting in the survey area, construction activity shall not occur without coordination with regulating agencies and may require an agency-approved bird management plan.

Timing/Implementation: Prior to commencement of and during project construction

Enforcement/Monitoring: City of Solana Beach Community Development Department

Level of Significance: Less than significant with mitigation incorporated.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? ***Less than Significant Impact.***

The proposed improvements would occur in conformance with requirements of the California Coastal Act and land use policies identified in the City of Solana Beach LCP/LUP. Policies 3.51 through 3.53 of the LCP/LUP address preservation of native trees. The project site supports disturbed/developed habitat and no native trees are present on-site; the project would not remove any such resources and would not conflict with LCP/LUP policies 3.51 through 3.53.

Therefore, the project would not conflict with any local policies or ordinances protecting biological resources. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

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? ***No Impact.***

The City of Solana Beach is located within the boundaries of the San Diego Multiple Habitat Conservation Program (MHCP). The MHCP, adopted on March 2003, is the subregional plan for the northwest portion of San Diego County and encompasses the Cities of Carlsbad, Encinitas, Escondido, Oceanside, Solana Beach, San Marcos, and Vista. The plan encompasses 111,908 acres and will conserve over 20,000 acres of natural habitat within the boundaries of participating cities for 77 species (SANDAG 2003). The City of Solana Beach is designated as Developed/Disturbed Land and is therefore exempt from the requirements to prepare a MHCP subarea plan. No other conservation plans apply to the subject site.

As stated above, no sensitive species have been documented on the project site due to the lack of suitable habitat and current level of disturbance, and no wetlands or riparian habitat are present on the property. Therefore, development of the site as proposed would not 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 would occur.

Mitigation Measures: None required.

Level of Significance: No impact.

5. Cultural Resources

	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less than Significant Impact	No Impact
5. CULTURAL RESOURCES. Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to CEQA Guidelines Section 15064.5?	☐	☒	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5?	☐	☒	☐	☐
c) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

The following evaluation is based upon the *Cultural Resources Inventory Report for the Ida Avenue Apartments Project* (Dudek 2021c), included as Appendix C of the IS/MND.

DISCUSSION OF IMPACTS

a) Cause a substantial adverse change in the significance of a historical resource pursuant to CEQA Guidelines Section 15064.5? ***Less than Significant Impact with Mitigation Incorporated.***

According to the City's General Plan Conservation and Open Space Element, nearly all of the earliest structures constructed in the City of Solana Beach have been removed to allow for new development in the years since the City's original subdivision map was filed. The oldest remaining structure is located within the 700 block of Ida Avenue, and is considered an important local historic resource (City of Solana Beach 2014).

Dudek prepared a cultural resources assessment for the project which considered the area of potential effect (APE). The APE includes the 0.94-acre residential lot (APN 298-162-37) and 0.5 acres of temporary construction impacts that would occur within the Caltrans ROW, totaling approximately 1.44 acres.

Dudek reviewed available historical aerial images to understand historical development patterns and land use within the project APE. The historical aerial imagery indicated that the APE has remained unaltered with the exception of surrounding development since 1953 (Dudek 2021c). As such, the site under current conditions remains in an undeveloped, yet disturbed state; no structures are present on the subject property.

Additionally, a records search of the Native American Heritage Commission (NAHC) Sacred Lands File and a pedestrian site survey were conducted for the APE and resulted in a negative finding for cultural or historical resources. Refer to the discussion below under Response 5(b) for additional details.

Although no known historic resources have been identified on-site, the potential for undiscovered historical resources to occur on-site does exist, largely due to the undeveloped nature of the site and consideration for other known historical resources located in the City. Therefore, mitigation measures CUL-1 to CUL-3 are proposed to ensure that if such resources are uncovered during

project-related ground-disturbing activities, construction would be halted and such resources evaluated to determine the significance of the resource; refer to the discussion below under Response 5(b) for a more detailed discussion. With incorporation of such measures, potential impacts on undiscovered historical resources would be reduced to less than significant.

Mitigation Measures: Implement mitigation measures CUL-1 to CUL-3.

Level of Significance: Less than significant with mitigation incorporated.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5? ***Less than Significant Impact with Mitigation Incorporated.***

As stated above, a cultural resources assessment was prepared for the project site and APE to evaluate the potential for cultural resources to occur on-site (Dudek 2021c). A records search was performed at the South Coastal Information Center at San Diego State University on January 28, 2020. The records search identified 33 cultural resources within 1 mile of the APE; however, no resources are located within the APE. One resource, P-37-013484/CA-SDI-13484, is located immediately south of the APE. The records search identified 81 studies that have been previously conducted within 1 mile of the project site, 10 of which intersect the APE. One of these studies describes the archaeological evaluation of P-37-013484/CA-SDI-13484 as a light marine shell scatter with trace amounts of ground stone and flaked lithic debitage (Dudek 2021c).

As stated above, available historical aerial images of the project APE were reviewed by Dudek. The aerial imagery indicated that the APE has remained unaltered with the exception of surrounding development since 1953 (Dudek 2021c). Therefore, no historic (or other) structures are present on the project site.

A search of the NAHC Sacred Lands File was requested on January 16, 2020, for review of the presence of Native American sites. Results of the search were negative for the project APE. Outreach letters to all Native American representatives included on the tribal contact list provided by the NAHC were mailed by Dudek on February 3, 2020. Responses from the Viejas Band of Kumeyaay Indians and San Pasqual Band of Mission Indians were subsequently received. Neither tribe indicated the presence of known resources within the project APE; however, the Viejas Band requested that a Kumeyaay cultural monitor be present during project ground disturbance activities. No other responses have been received to date (Dudek 2021c; see Appendix C).

A professional archaeologist and a Red Tail Native American monitor conducted a pedestrian survey of the project APE in January 2020. Although the site is presently undeveloped, the APE was covered by vegetation resulting in poor ground visibility. The pedestrian survey did not identify any cultural or built-environment resources within the project APE, including the project site and the adjacent Caltrans ROW (Dudek 2021c).

Although the records search and pedestrian survey were negative for cultural resources, the undeveloped nature of the APE and poor ground visibility increase the cultural sensitivity of the project APE. As such, the potential for unknown cultural resources does exist. It is therefore recommended that an archaeological and Kumeyaay Native American monitor be present on-site during initial ground disturbance activities to ensure proper treatment of inadvertent cultural discoveries. In the unlikely event that archaeological materials are discovered, mitigation is proposed to reduce any potential impacts to less than significant levels (mitigation measure CUL-1).

Additionally, the City of Solana Beach General Plan Conservation and Open Space Element Policy 6.b states: "The city shall require that sites proposed for future development are to be evaluated by certified archaeologists and/or paleontologists in accordance with the California Environmental Quality Act. Where potentially significant adverse impacts are identified, the city shall require appropriate mitigation measures such as in site preservation or professional retrieval" (City of Solana Beach 2014).

As such, mitigation measures CUL-1 to CUL-3 would be implemented to allow for the contractor to halt construction activities on-site in the event that unknown cultural resources are unearthed, until a qualified archeologist could determine the significance of the find. With implementation of mitigation measures CUL-1 to CUL-3, impacts on archaeological resources would be reduced to less than significant.

Mitigation Measures:

CUL-1 **Cultural Resources Monitoring Program.** A Cultural Resource Mitigation Monitoring Program shall be conducted to provide for the identification, evaluation, treatment, and protection of any cultural resources that are affected by or may be discovered during the construction of the proposed project. The monitoring shall consist of the full-time presence of a qualified archaeologist and a traditionally and culturally affiliated (TCA) Native American monitor (Kumeyaay) shall be retained to monitor ground-disturbing activities associated with project construction, including vegetation removal, clearing, grading, trenching, excavation, or other activities that may disturb original (pre-project) ground, including the placement of fill materials.

- The requirement for cultural resource mitigation monitoring shall be noted on all applicable construction documents, including grading plans.
- The qualified archaeologist and TCA Native American monitor shall attend all applicable preconstruction meetings with the contractor and/or associated subcontractors.
- The qualified archaeologist shall maintain ongoing collaborative consultation with the TCA Native American monitor during all ground-disturbing or altering activities, as identified above.
- The qualified archaeologist and/or TCA Native American monitor may halt ground-disturbing activities if archaeological artifact deposits or cultural features are discovered. In general, ground-disturbing activities shall be directed away from these deposits for a short time to allow a determination of potential significance, the subject of which shall be determined by the qualified archaeologist and the TCA Native American monitor, in consultation with the Kumeyaay affiliated tribes. Ground-disturbing activities shall not resume until the qualified archaeologist, in consultation with the TCA Native American monitor, deems that the cultural resource or feature has been appropriately documented and/or protected. At the qualified archaeologist's discretion, the location of ground-disturbing activities may be relocated elsewhere on the project site to avoid further disturbance of cultural resources.
- The avoidance and protection of discovered unknown and significant cultural resources and/or unique archaeological resources is the preferable mitigation for the proposed project. If avoidance is not feasible, a Data Recovery Plan may be authorized by the City as the lead agency under CEQA. If a data recovery is required, then the Kumeyaay

affiliated tribes shall be notified and consulted in drafting and finalizing any such recovery plan.

- The qualified archaeologist and/or TCA Native American monitor may also halt ground-disturbing activities around known archaeological artifact deposits or cultural features if, in their respective opinions, there is the possibility that they could be damaged or destroyed.
- The landowner shall relinquish ownership of all tribal cultural resources collected during the cultural resource mitigation monitoring conducted during all ground-disturbing activities, and from any previous archaeological studies or excavations on the project site, to the Kumeyaay affiliated tribes for respectful and dignified treatment and disposition, including reburial, in accordance with the tribe's cultural and spiritual traditions. All cultural materials that are associated with burial and/or funerary goods will be repatriated to the most likely descendant as determined by the Native American Heritage Commission per California Public Resources Code Section 5097.98.

CUL-2 **Prepare Monitoring Report and/or Evaluation Report.** Prior to the release of the grading bond, a monitoring report and/or evaluation report, which describes the results, analysis, and conclusions of the cultural resource mitigation monitoring efforts (such as, but not limited to, the Research Design and Data Recovery Program), shall be submitted by the qualified archaeologist, along with the TCA Native American monitor's notes and comments, to the City's Community Development Director for approval.

CUL-3 **Identification of Human Remains.** As specified by California Health and Safety Code Section 7050.5, if human remains are found on the project site during construction or during archaeological work, the person responsible for the excavation, or his or her authorized representative, shall immediately notify the San Diego County Coroner's office by telephone. No further excavation or disturbance of the discovery or any nearby area reasonably suspected to overlie adjacent remains (as determined by the qualified archaeologist and/or the TCA Native American monitor) shall occur until the coroner has made the necessary findings as to origin and disposition pursuant to Public Resources Code 5097.98. If such a discovery occurs, a temporary construction exclusion zone shall be established surrounding the area of the discovery so that the area would be protected (as determined by the qualified archaeologist and/or the TCA Native American monitor), and consultation and treatment could occur as prescribed by law. As further defined by state law, the coroner would determine within two working days of being notified if the remains are subject to his or her authority. If the coroner recognizes the remains to be Native American, he or she shall contact the Native American Heritage Commission (NAHC) within 24 hours. The NAHC would make a determination as to the most likely descendent. If Native American remains are discovered, the remains shall be kept in situ ("in place"), or in a secure location in close proximity to where they were found, and the analysis of the remains shall only occur on-site in the presence of the TCA Native American monitor.

Timing/Implementation: Prior to commencement of and during project construction

Enforcement/Monitoring: City of Solana Beach Community Development Department

Level of Significance: Less than significant with mitigation incorporated.

c) Disturb any human remains, including those interred outside of formal cemeteries? ***Less than Significant with Mitigation Incorporated.***

No known cemeteries are located on-site and no such resources were identified during the records searches, consultation efforts, or field survey. Although no known human remains have been identified on-site, the potential for project ground-disturbing activities to result in impacts to unknown resources does exist, particularly

The project would be required to comply with regulatory requirements for treatment of Native American human remains contained in California Health and Safety Code Sections 7050.5 and 7052 and California Public Resources Code Section 5097. Additionally, implementation of mitigation measure CUL-3 would reduce project impacts on unknown human remains to less than significant. Potential construction impacts on human remains would be reduced to less than significant with mitigation incorporated.

Mitigation Measures: Implement mitigation measures CUL-1 to CUL-3.

Level of Significance: Less than significant with mitigation incorporated.

6. Energy

	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less than Significant Impact	No Impact
6. ENERGY. 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?	☐	☐	☒	☐

The following discussion is based in part on the *Air Quality and Greenhouse Gas Emissions Analysis Technical Report* prepared by Dudek (Dudek 2021a; see Appendix A). Additional information pertaining to anticipated energy use for the City of Solana Beach was obtained from the City's General Plan.

According to the City of Solana Beach General Plan Conservation and Open Space Element, San Diego Gas & Electric (SDG&E) provides natural gas and electricity to the City. The City's electrical needs are served by SDG&E's substations located in Del Mar, Encinitas, and Rancho Santa Fe. SDG&E provides electrical power flow via an integrated mix of primary energy resources including oil, natural gas, hydropower, coal, geothermal, co-generation, and nuclear. SDG&E purchases a substantial portion of its electrical supply from other utilities, and its entire natural gas supply is purchased from the Southern California Gas Company (City of Solana Beach 2014).

DISCUSSION OF IMPACTS

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.***

Within Solana Beach, it is estimated that multi-family residential uses consume an estimated 3,918 cubic feet per unit of natural gas and 6,081 kilowatt hours per dwelling unit annually for electricity on average (City of Solana Beach 2014). Based on assumed energy consumption factors and the maximum General Plan buildout scenario, ultimate natural gas consumption for the City is estimated to be approximately 442.8 million cubic feet annually while electrical consumption is projected at approximately 84,657.2 megawatt hours annually. These consumption levels represent increases of approximately 9.0 percent for natural gas and 7.5 percent for electricity; however, as indicated in the General Plan, such increases are not considered to be significant and are within the parameters of SDG&E's projected future load growth for the Solana Beach area (City of Solana Beach 2014).

As indicated in the City's General Plan, as new development occurs and/or older existing structures within the City are renovated, energy conservation measures can be incorporated to reduce the City's future energy demands. Integrating relevant planning and building design measures would help to reduce overall demand for non-renewable resources as well as the City's susceptibility to potential future energy supply shortages. Such measures would also contribute to regional and national goals to reduce dependency on non-renewable energy supplies.

The four sources of energy relative to the proposed project include electricity, natural gas, the equipment-fuel necessary for project construction, and the automotive fuel necessary for project operations. Addressing energy impacts requires an agency to make a determination as to what constitutes a significant impact. There are no established thresholds of significance, statewide or locally, for what constitutes a wasteful, inefficient, or unnecessary consumption of energy for a land use project.

Title 24 of the California Administrative Code contains building code provisions pertaining to energy conservation measures that are intended to be incorporated into building designs. Such measures include technologies such as building insulation, weatherstripping, insulation of water heaters and pipes, water flow restrictors, and energy-efficient lighting systems. By incorporating Title 24 considerations into the design review process, the City can contribute to the goal of minimizing increased energy consumption levels. As such, the proposed project would be required to meet the mandatory energy requirements of the California Green Building Standards Code (CALGreen) and the version of the California Energy Code (Title 24, Part 6 of the California Code of Regulations) in effect at the time when building permits are obtained. Conformance with relevant measures identified in Title 24 would ensure that project energy demands are reduced, helping the City to meet identified energy efficiency goals over the long-term.

The amount of electricity and natural gas anticipated to be consumed by the project for lighting, space and water heating, and landscape maintenance during construction and operations, as compared to that consumed by all residential land uses in Solana Beach and/or San Diego County, would be de minimis. As the project would be limited to construction and operation of 8 new multi-family residential units, any resulting increase in electricity and natural gas consumption over existing conditions would be limited and inconsequential as compared to that which presently occurs on a local or regional scale. The use of such resources for the project would not be considered wasteful or unnecessary, and would be further reduced by project deign conformance with CalGreen and Title 24 requirements.

Fuel necessary for project construction would be required for the operation and maintenance of construction equipment and the transportation of materials to the project site. The fuel expenditure necessary to construct the physical buildings and infrastructure would be temporary, lasting only as long as project construction. No unusual project characteristics would necessitate the use of construction equipment that would be less energy efficient than at comparable construction sites in the region or the state. Construction contractors would purchase their own gasoline and diesel fuel from local suppliers and would use fuel supplies to minimize costs due to waste and subsequently maximize profits. Additionally, construction equipment fleet turnover and increasingly stringent state and federal regulations on engine efficiency, combined with state regulations limiting engine idling times and requiring recycling of construction debris, would further reduce the amount of transportation fuel demand during project construction. It is therefore anticipated that construction fuel consumption associated with the project would not be any more inefficient, wasteful, or unnecessary than other development projects of a similar nature.

The 8-unit multi-family residential project would generate an estimated 48 daily vehicle trips, or 6 daily trips per unit (LL&G 2021). As such, project-related vehicle trips would not represent a substantial increase in the demand for or use of fuels for the purpose of travel, as compared to trips generated within the City of Solana Beach or the County of San Diego under current conditions. As such, the project is not anticipated to result in vehicle-related fuel consumption

that would be uniquely inefficient, wasteful, or unnecessary in comparison to other similar developments in the region.

Based on the discussion above, the project would not result in a potentially significant environmental impact due to the wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

b) Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency? ***Less than Significant Impact.***

The project has been designed in a manner that is consistent with relevant energy conservation plans aimed at encouraging development that results in the efficient use of energy resources. The project would be built to the Energy Efficiency Standards for Residential and Nonresidential Buildings, as specified in Title 24, Part 6, of the California Code of Regulations (Title 24). Title 24 was established in 1978 in response to a legislative mandate to reduce California's energy consumption. Title 24 is updated approximately every three years. The most recent update to the Energy Standards focuses on several key areas to improve the energy efficiency of newly constructed buildings and additions and alterations to existing buildings.

Additionally, the California Green Building Standards Code (CalGreen, amended 2013) establishes mandatory green building standards for all buildings in California. The code covers 5 categories: planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and indoor environmental quality. The project would be designed consistent with such measures to ensure that energy efficiency is achieved as required.

Furthermore, the project would be consistent with relevant goals and policies of the City's General Plan pertaining to energy conservation. Policy 7.a. of the Conservation and Open Space Element requires that new development incorporate energy conservation measures and promote alternative energy systems. Additionally, the Housing Element identifies Policy H-6.2 which encourages the use of building placement, design, and construction techniques that minimize energy consumption. Housing Element Policy H-6.4 also requires that, consistent with the California Public Utilities Commission's California Long Term Energy Efficiency Strategy Plan, the City should strive to achieve zero net energy use for new residential development by 2020 and zero net energy use for new commercial development by 2030.

The City has also adopted its Climate Action Plan (CAP) which identifies measures relative to renewable energy and building design, with the ultimate goal of reducing greenhouse gas emissions. A key measure in the CAP is Measure E-1 which is aimed at implementing a Community Choice Aggregation program, subject to City Council approval, to achieve the goal of 100 percent renewable electricity by 2035 (City of Solana Beach 2013). This program allows for local governments to aggregate electricity demand within their respective jurisdictions in order to obtain alternative energy supplies, while still maintaining their existing electricity provider for purposes of transmission and distribution to the service population. As such, City participation in the program would also allow the proposed project to further contribute to state and local energy reduction goals.

For the reasons above, the project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

7. Geology and Soils

	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less than Significant Impact	No Impact
7. GEOLOGY AND SOILS. 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 projects, and potentially result in on- or off-site landside, 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 wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐

The following analysis is based upon available soils and geotechnical data from various sources, including databases, soils maps, and the City of Solana Beach General Plan. Relevant information has been reviewed and incorporated herein where appropriate relative to the proposed project.

DISCUSSION OF IMPACTS

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? ***Less than Significant Impact.***

Southern California, including the project site, is subject to the effects of seismic activity because of the active faults that traverse the region. Active faults are defined as those that have experienced surface displacement within Holocene time (approximately the last 11,000 years) and/or are in a state-designated Alquist-Priolo Earthquake Fault Zone.

Key regional faults potentially affecting the City include the San Andreas, Elsinore, San Jacinto, and San Clemente Faults. Additionally, an offshore extension of the Rose Canyon Fault lies approximately 2 miles west of the City and is considered to be potentially active and could therefore produce severe ground shaking within the City (City of Solana Beach 2014). The project site is not located in a fault rupture hazard zone identified by the Alquist-Priolo Earthquake Fault Zoning Act, Special Publication 42, Revised 1997, Fault-Rupture Hazards Zones in California; no such zones have been designated in or near the City of Solana Beach, and therefore, the potential for fault rupture to affect the project site is considered low (DOC 2018).

Although no active faults traverse the site, all new development would be required to comply with the requirements of the Alquist-Priolo Fault Zoning Act and the California Building Code (CBC). CBC requirements address structural seismic safety; include design criteria for seismic loading and other geologic hazards, including for geologically induced loading that governs sizing of structural members, building supports, and materials; and provide calculation methods to assist in the design process. The CBC includes provisions for buildings to structurally survive an earthquake without collapsing and includes measures such as anchoring to the foundation and structural frame design.

Due to the distance to the nearest fault and the magnitude of past seismic activity in the area, the project would not cause potential substantial adverse effects, including the risk of loss, injury, or death, involving rupture of a known earthquake fault. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

ii) Strong seismic ground shaking? ***Less than Significant Impact.***

Southern California has numerous active seismic faults potentially subjecting people to earthquake- and seismic-related hazards. Seismic activity poses two types of potential hazards for people and structures, categorized as either primary or secondary hazards. Primary hazards include ground rupture, ground shaking, ground displacement, subsidence, and uplift from earth movement. Secondary hazards include ground failure (lurch cracking, lateral spreading, and slope failure), liquefaction, water waves (seiches), movement on nearby faults (sympathetic fault movement), dam failure, and fires.

The project site is in a seismically active region and could experience ground shaking associated with an earthquake along nearby faults, including the Rose Canyon fault zone. The project site is likely to be subjected to strong ground motion from seismic activity, similar to that of the rest of San Diego County and Southern California, due to seismic activity in the region as a whole. Regardless of the seismic activity anticipated to occur on-site, the project would be designed in accordance with CBC requirements that address structural seismic safety.

All new development would be required to comply with the CBC, which includes design criteria intended to maximize structural stability in the event of an earthquake. Thus, while shaking impacts would be potentially damaging, they would also tend to be reduced in their structural effects due to CBC criteria that recognize this potential.

Project conformance with CBC and local requirements relative to grading and construction would ensure that the project does not result in exposure of people or structures to potentially substantial adverse effects involving strong seismic ground shaking. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

iii) Seismic-related ground failure, including liquefaction? ***Less than Significant Impact.***

Liquefaction is the phenomenon whereby soils lose shear strength and exhibit fluid-like flow behavior. Loose granular soils are most susceptible to these effects, with liquefaction generally restricted to saturated or near-saturated soils at depths of less than 50 feet. Liquefaction normally occurs in soils such as sand in which the strength is purely friction. However, liquefaction has occurred in soils other than clean sand. Liquefaction occurs under vibratory conditions such as those induced by a seismic event.

In the Solana Beach area, the potential for liquefaction is limited to the area located generally between Stevens Avenue and Valley Avenue, and north of Via de la Valle between Del Mar Downs and Stevens Avenue. These are the only areas in the City underlain by poorly consolidated alluvium and slope wash that could liquefy during an earthquake depending upon groundwater conditions (City of Solana Beach 2014). As the project site is not located in proximity to either of these areas, the potential for liquefaction to occur on-site is considered low.

Groundwater levels in the project vicinity are anticipated to be greater than 20 feet below ground surface (Armstrong & Brooks 2018). However, groundwater levels may fluctuate with precipitation, irrigation of adjacent lands, drainage, and site grading.

Project design and construction would incorporate standard design measures, including similar types of measures from the CBC, to address potential seismic-related liquefaction and related effects such as settlement and lateral spreading. Preparation of a comprehensive design-level geotechnical evaluation would be required, prior to final design and construction. Completion of this evaluation and adherence to the current CBC and local codes regulating construction would ensure that the project is designed to withstand seismic-related ground failure, including liquefaction. With site-specific engineering design, impacts due to liquefaction would be reduced less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

iv) Landslides? ***Less than Significant Impact.***

The topography of the City of Solana Beach is generally flat. The principal area of concern regarding slope stability is along the City's coastal bluffs. Therefore, landslides are not considered to represent a major safety hazard (City of Solana Beach 2014).

Topography of the project site is also generally flat; average elevation is approximately 110 feet above mean sea level (Dudek 2021c). Slopes over 25 percent are limited to approximately 7 percent of the property and are generally limited to the westernmost portion of the site, within proximity to Ida Avenue. Further, signs of landslides are not present on-site.

All project components would be designed in accordance with applicable standards and specifications for seismic safety identified in the CBC and City of Solana Beach regulations. Therefore, no significant impact from exposure of people or structures to potential adverse effects from landslides would occur.

Mitigation Measures: None required.

Level of Significance: Less than significant.

b) Result in substantial soil erosion or the loss of topsoil? ***Less than Significant Impact.***

Soil erosion is most prevalent in unconsolidated alluvium and surficial soils and in areas that have slopes. Erosive soils are generally found in areas of steep slope where runoff velocity is greater and vegetative cover is low. According to the US Department of Agriculture's Natural Resources Conservation Service Web Soil Survey website, two soil types are located within the project area: Carlsbad gravelly loamy sand, 9 to 15 percent slopes, classified as moderately well-drained with a low potential for runoff, and Corralitos loamy sand, 9 to 15 percent slopes, classified as somewhat excessively drained with a very low potential for runoff (USDA n.d.).

Grading and trenching during project construction would displace soils and temporarily increase the potential for soils to be subject to wind and water erosion. In addition, the project would increase impervious surface areas on-site, which would potentially contribute to increased stormwater runoff.

The project applicant would be required to meet City grading standards and prepare a Storm Water Pollution Prevention Plan (SWPPP) in accordance with National Pollutant Discharge Elimination System (NPDES) permit requirements for approval by the City prior to grading. The SWPPP would identify specific best management practices (BMPs) to be implemented by the project applicant to prevent erosion, minimize siltation from impacting downstream water bodies, and protect water quality. Water quality features intended to reduce construction-related erosion impacts would be clearly noted on the project grading plans for implementation by the construction contractor. Additionally, the City implements its Jurisdictional Runoff Management Program, which governs the activities and programs implemented to comply with the NPDES permit. With conformance to the above standards, project impacts related to soil erosion or the loss of topsoil would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

c) *Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the projects, and potentially result in on- or off-site landside, lateral spreading, subsidence, liquefaction, or collapse?* ***Less than Significant Impact.***

On- or Off-Site Landslide

Refer to Response 7(a)iv, above. Landslides are not considered to represent a major safety hazard for the City of Solana Beach (City of Solana Beach 2014). The project site is generally level and does not support steep slopes or hillsides, with the exception of limited slopes in the westernmost portion, adjacent to Ida Avenue. Therefore, the site is not considered to be susceptible to landslides. Furthermore, the project as designed would be required to comply with structural standards set forth by both the City and the state. Impacts in this regard would be less than significant.

Lateral Spreading

Lateral spreading is a phenomenon in which large blocks of intact, non-liquefied soil move down slope on a liquefied soil layer. Lateral spreading is often a regional event. For lateral spreading to occur, the liquefiable soil zone must be unconstrained laterally and free to move along sloping ground.

The project site is generally flat and does not support slopes that may be subject to the potential for lateral spread. The risk of lateral spreading can be further reduced through appropriate land use planning, development engineering, and building construction practices. As such, the project would comply with the most recent CBC, as adopted by the City of Solana Beach, which contains requirements for existing and new buildings designed to ensure structural integrity during seismic events and to prevent injury, loss of life, and substantial property damage due to liquefaction. Conformance with such regulations would ensure that project impacts relative to lateral spreading remain less than significant.

Subsidence

Subsidence refers to the sudden sinking or gradual downward settling and compaction of soil and other surface material with little or no horizontal motion. Subsidence may be induced by a variety of human and natural activities, including from fluid withdrawal (e.g., oil or groundwater extraction) or seismic events (e.g., earthquakes).

There are no areas in or near Solana Beach where these types of subsidence hazards have been identified (City of Solana Beach 2014). Therefore, the project is not considered to 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 subsidence. Impacts would be less than significant.

Liquefaction

Refer to Response 7(a)iii, above. The risk of liquefaction to occur on-site is considered to be low based on existing geologic conditions. However, the potential for liquefaction would be further reduced through appropriate land use planning, development engineering, and building construction practices. As such, the project would comply with the most recent CBC, as adopted by the City of Solana Beach, which contains structural requirements for existing and new buildings designed to ensure structural integrity during seismic events and to prevent injury, loss of life, and substantial property damage. Conformance with such requirements would reduce potential impacts relative to liquefaction to less than significant.

Collapse

Neither natural nor man-made subsurface features that encourage collapse, including mines, aggregate extraction operations, or karst topography, are known to underlie or occur adjacent to the project site. Therefore, mandatory compliance with applicable state and local codes would ensure that impacts related to unstable or collapsible soils would remain less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

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? ***Less than Significant Impact.***

Soils that include clay materials have the potential to swell when their moisture content increases and shrink when moisture decreases. The resultant shrinking and swelling (expansion) of these soils has the potential to result in extensive structural damage to buildings and infrastructure.

The project is not located within an expansive soil area, which is characterized by clay soils. As indicated in the City's General Plan Safety Element, expansive soils are not considered to represent a substantial issue within the City (City of Solana Beach 2014). Soils present on the project site include Carlsbad gravelly loamy sands and Corralitos loamy sands (USDA n.d.), which are not considered to be highly expansive soils. Furthermore, the project would be constructed pursuant to the CBC and the City of Solana Beach regulations intended to protect against structural damage due to expansive soils. Project compliance with both state and local building codes would ensure that development of the project as proposed would not create a substantial risk to life or property due to expansive soils. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater? ***No Impact.***

The project would be served by the public sewer system operated by the City. The project would connect to a proposed 8-inch sewer line to be constructed in Ida Avenue, with connection to an existing 8-inch sewer line located within Ida Avenue, approximately 70 feet south of the southern project boundary.

Therefore, the project would not utilize septic tanks or leach fields for purposes of wastewater disposal. No impact would occur.

Mitigation Measures: None required.

Level of Significance: No impact.

f) Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? ***Less than Significant Impact with Mitigation Incorporated.***

There are no known paleontological resources located on the subject site. However, ground-disturbing activity associated with project construction would have the potential to encounter undiscovered paleontological resources buried within the site.

According to the City of Solana Beach General Plan Conservation and Open Space Element, the geologic formations in Solana Beach consist of marine sedimentary deposits and are therefore expected to contain fossils. No significant fossil localities have been identified within the City; however, fossil site locations have been identified along the coastline between the cities of Del Mar and La Jolla. Such resources included fossil mollusk localities, fossil calcereous nannoplankton localities, and fossil mammal localities. Aquatic shell fossils have also been found in the northwest portion of the City of Solana Beach (City of Solana Beach 2014).

The project site is generally disturbed; however, the site remains undeveloped. Although it is not anticipated that significant paleontological resources are present on-site, the possibility for discovery of unknown resources does exist. To ensure protection of such resources, the City generally requires a paleontological survey in conjunction with any future ground-disturbing construction activities. Should any such resources be unearthed, a paleontologist shall be empowered to halt grading activities until the resources are sufficiently retrieved, as set forth in mitigation measure GEO-1. Implementation of mitigation measure GEO-1 would reduce project impacts on paleontological resources to less than significant.

Mitigation Measure:

GEO-1 During project excavation/grading operations, if paleontological resources are encountered, all work shall be halted or redirected and the City of Solana Community Development Department shall be notified in writing within 24 hours of identification. Said work shall be halted or redirected until a qualified paleontologist can evaluate the significance of the discovery. If the project paleontologist determines that the discovery represents a potentially significant paleontological resource, proper measures shall be identified for the documentation, recovery, and/or preservation of such resources, as appropriate.

Timing/Implementation: During project excavation and grading

Enforcement/Monitoring: City of Solana Beach Community Development Department

Level of Significance: Less than significant with mitigation incorporated.

8. Greenhouse Gas Emissions

	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less than Significant Impact	No Impact
8. GREENHOUSE GAS EMISSIONS. Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

The following evaluation is based upon the *Air Quality and Greenhouse Gas Emissions Analysis Technical Report*, prepared by Dudek (Dudek 2021a); refer to Appendix A.

DISCUSSION OF IMPACTS

Certain gases in the earth's atmosphere, classified as greenhouse gases (GHGs), play a critical role in determining the earth's surface temperature. Prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO_2), methane (CH4), and nitrous oxide (N_2O). Human caused emissions of these GHGs in excess of natural ambient concentrations are believed to be responsible for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth's climate, known as global climate change or global warming. Refer to Appendix A for additional discussion of global warming and climate change.

In evaluating potential impacts relative to GHG emissions, the Office of Planning and Research Technical Advisory entitled *CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act Review* states that "public agencies are encouraged but not required to adopt thresholds of significance for environmental impacts. Even in the absence of clearly defined thresholds for GHG emissions, the law requires that such emissions from CEQA projects must be disclosed and mitigated to the extent feasible whenever the lead agency determines that the project contributes to a significant, cumulative climate change impact." Furthermore, the advisory document indicates that "in the absence of regulatory standards for GHG emissions or other scientific data to clearly define what constitutes a 'significant impact,' individual lead agencies may undertake a project-by-project analysis, consistent with available guidance and current CEQA practice" (Dudek 2021a).

City of Solana Beach

No bright-line threshold has been formally adopted by an air district or other lead agencies for use in the San Diego region. The California Air Pollution Control Officers Association (CAPCOA) recommended an interim 900 metric tons of carbon dioxide equivalent (MT CO_2e) screening level as a theoretical approach to identify projects that require further analysis and potential mitigation (Dudek 2021a). The 900 MT CO_2e per year screening threshold was developed by CAPCOA based on data collection on various development applications submitted among four diverse cities, namely, the Cities of Los Angeles, Pleasanton, Dublin, and Livermore. Following the review of numerous pending applications within these four cities, an analysis was conducted to determine the threshold that would capture 90 percent or more of applications that would be required to conduct a full GHG analysis and implement GHG emission reduction measures as part of final project design. Following CAPCOA's analysis of development applications in various cities, it

was determined that the threshold of 900 MT CO_2E per year would achieve the objective of 90 percent capture and ensure that new development projects would keep the State of California on track to meet the goals of Assembly Bill (AB) 32.

The 900 MT CO_2e screening level threshold is considered appropriate for small redevelopment projects. Consequently, the interim screening level recommended by the CAPCOA would be appropriate for the proposed project. The 900 MT CO_2e threshold is applied to evaluate whether a project would generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.

The analysis for compliance with regulatory programs only applies to the individual area addressed by the regulatory program. If the project is determined to have GHG emissions less than 900 MT CO_2e per year, then the project's cumulative contribution of GHG emissions would be considered less than significant. Conversely, if the project is determined to exceed the 900 MT CO_2E per year threshold, then the project's cumulative contribution of GHG emissions would be considered significant and feasible mitigation measures would be required.

CEQA Guidelines Section 15183.5 also specifies that the project's CEQA analysis "must identify those requirements specified in the plan that apply to the project, and, if those requirements are not otherwise binding and enforceable, incorporate those requirements as mitigation measures applicable to the project." The City adopted a Climate Action Plan (CAP) in July 2017, with the aim of mitigating citywide GHG emissions while meeting the goals of AB 32. The CAP includes emission reduction targets of 15 percent below baseline conditions (2010) by 2020 and 50 percent below baseline conditions by 2035 (Dudek 2021a). However, the CAP was not prepared in accordance with the requirements of CEQA Guidelines Section 15183.5. Therefore, the CAP is not considered a qualified GHG emission reduction plan and cannot be used to tier from for CEQA. Additionally, the CAP does not direct private actions. Instead, it informs the development of City ordinances that the project is required to adhere to.

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? ***Less than Significant Impact.***

Construction Emissions

Construction of the project would result in GHG emissions, which are primarily associated with the use of off-road construction equipment, on-road vendor trucks, and worker vehicles.

California Emissions Estimator Model (CalEEMod) Version 2016.3.2 was used to calculate the annual GHG emissions based on the construction scenario described in Section 3, Air Quality; refer to Appendix A for discussion of construction assumptions used in the model. Project construction is anticipated to take approximately 11 months. Table 8-1, Estimated Annual Construction Greenhouse Gas Emissions, identifies project-generated emissions from construction-related sources.

Table 8-1. Estimated Annual Construction Greenhouse Gas Emissions

Year	CO_2	CH_4	N_2O	CO_2e
	Metric Tons			
2021	167.69	0.03	0.00	168.33
2022	79.01	0.01	0.00	79.36
Total	**246.70**	**0.04**	**0.00**	**247.69**
30-year Amortized Construction Emissions (MT CO_2e per year)				**8.26**

Source: Dudek 2021a; see Appendix A.
Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent; MT = metric tons.
See Appendix A of Appendix A for complete results.
Totals may not add due to rounding.

As shown in Table 8-1, total GHG construction emissions are estimated to be approximately 248 MT CO_2e over the construction period. Estimated project-generated construction emissions amortized over 30 years would be approximately 8 MT CO_2e per year. As with project-generated construction criteria air pollutant emissions, GHG emissions generated during project construction would be short term in nature, lasting only for the duration of the construction period (11 months) and would not represent a long-term source of GHG emissions. As there is no separate GHG threshold for construction, the evaluation of significance is discussed in the operational emissions analysis below.

Operational Emissions

CalEEMod Version 2016.3.2 was used to estimate potential project-generated operational GHG emissions from area sources; refer to Appendix A for discussion of operational assumptions used in the model. Project operation would generate GHG emissions through motor vehicle trips to and from the project site; operation of landscape maintenance equipment; energy use (natural gas and generation of electricity consumed by the project); solid waste disposal; and generation of electricity associated with water supply, treatment, and distribution and wastewater treatment.

The estimated operational (year 2023) project-generated GHG emissions from area sources, energy usage, motor vehicles, solid waste generation, water usage, and wastewater generation are shown in Table 8-2, Estimated Annual Operational Greenhouse Gas Emissions.

Table 8-2. Estimated Annual Operational Greenhouse Gas Emissions

Emission Source	CO_2	CH_4	N_2O	CO_2e
	metric tons per year			
Area	0.10	<0.01	0.00	0.10
Energy	13.05	<0.01	<0.01	13.11
Mobile	51.95	<0.01	0.00	52.02
Solid waste	0.75	0.04	0.00	1.85
Water supply and wastewater	2.53	<0.01	<0.01	2.67
Operational Emissions				69.75
30-Year Amortized Construction Emissions				*8.26*
Operation plus Amortized Construction Total				**78.01**

Source: Dudek 2021a; see Appendix A.
Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent; <0.01 = reported emissions are less than 0.01.
The values shown are the annual emissions for operational year 2023.
Totals may not add due to rounding.

As shown in Table 8-2, estimated annual project-generated GHG emissions would total approximately 70 MT CO_2e per year as a result of project operations only. Estimated annual project-generated operational emissions in 2023 plus amortized project construction emissions would be approximately 78 MT CO_2e per year. Thus, the project's estimated GHG emissions would not exceed the 900 MT CO_2e per year significance threshold.

The project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases? ***Less than Significant Impact.***

The City adopted a CAP in July 2017, with the aim of mitigating citywide GHG emissions while meeting the goals of AB 32. The CAP includes emission reduction targets of 15 percent below baseline conditions (2010) by 2020 and 50 percent below baseline conditions by 2035 (City of Solana Beach 2017). However, the CAP was not prepared in accordance with the requirements of CEQA Guidelines Section 15183.5. Therefore, the CAP is not considered a qualified GHG emission reduction plan and cannot be used to tier from for CEQA. Additionally, the CAP does not direct private actions. Instead, it informs the development of City ordinances that the project is required to adhere to. In this regard, the project as proposed would not conflict with the goals, policies, and emission reduction targets set forth in the CAP, nor would the project impede the state's ability to achieve these reduction goals.

Consistency with SANDAG'S 2019 Federal Regional Transportation Plan

Regarding consistency with SANDAG's 2019 Federal Regional Transportation Program (RTP), the project would be developed to support the policy objectives of the RTP and Senate Bill (SB) 375.

Table 8-3, 2019 Federal Regional Transportation Plan Consistency Analysis, illustrates the project's consistency with applicable goals and policies of the 2019 Federal RTP (Dudek 2021a).

Table 8-3. 2019 Federal Regional Transportation Plan Consistency Analysis

Category	Policy Objective or Strategy	Consistency Analysis
Habitat and Open Space Preservation	Focus growth in areas that are already urbanized, allowing the region to set aside and restore more open space in our less developed areas.	*Consistent.* The project would not impact open space lands.
Habitat and Open Space Preservation	Protect and restore our region's urban canyons, coastlines, beaches, and water resources.	*Consistent.* The project would not impact open space lands.
Regional Economic Prosperity	Invest in transportation projects that provide access for all communities to a variety of jobs with competitive wages.	*Not Applicable.* The project would not impair the ability of SANDAG to invest in transportation projects available to all members of the community.
Regional Economic Prosperity	Build infrastructure that makes the movement of freight in our community more efficient and environmentally friendly.	*Not Applicable.* The project does not propose regional freight movement, nor would it impair SANDAG's ability to preserve and expand options for regional freight movement.
Environmental Stewardship	Make transportation investments that result in cleaner air, environmental protection, conservation, efficiency, and sustainable living.	*Consistent.* The project would promote walkability and alternative transportation by creating neighborhoods that are linked by a series of interconnected sidewalks that would connect residents to existing transit. Thus, the project would help to reduce local air quality and GHG emissions.
Environmental Stewardship	Support energy programs that promote sustainability.	*Not Applicable.* The project would not impair the ability of SANDAG to support energy programs to promote sustainability.
Mobility Choices	Provide safe, secure, healthy, affordable, and convenient travel choices between the places where people live, work, and play.	*Not Applicable.* The project would not impair the ability of SANDAG to provide additional transportation choices within the region.
Mobility Choices	Take advantage of new technologies to make the transportation system more efficient and environmentally friendly.	*Not Applicable.* The project would not impair the ability of SANDAG to implement new technologies in the transportation system within the region.
Healthy and Complete Communities	Create great places for everyone to live, work, and play.	*Consistent*. The project would interconnect sidewalks, which would provide residents the opportunity to access nearby neighborhoods.
Healthy and Complete Communities	Connect communities through a variety of transportation choices that promote healthy lifestyles, including walking and biking.	*Not Applicable.* The project would not impair the ability for SANDAG to create additional transportation opportunities to promote a healthy lifestyle.
Healthy and Complete Communities	Increase the supply and variety of housing types – affordable for people of all ages and income levels in areas with frequent transit service and with access to a variety of services.	*Consistent.* The project would develop eight residential apartment units.

Table 8-3, continued

Category	Policy Objective or Strategy	Consistency Analysis
Sustainability	Focus Housing and job growth in urbanized areas where there is existing and planned transportation infrastructure, including transit.	*Consistent.* The project would be located near major urban and employment centers.
Sustainability	Protect the environment by preserving sensitive habitat, open space, and farmland.	*Consistent.* The project would not impact any open space.
Sustainability	Invest in a transportation network that gives people transportation options and reduces greenhouse gas emissions.	*Not Applicable.* The project would not impair the ability of SANDAG to invest in transportation projects available to all members of the community.
Sustainability	Address the housing needs of all economic segments of the population.	*Consistent.* The project would develop eight residential apartment units.
Sustainability	Implement the 2019 Federal RTP through incentives and collaboration.	*Not Applicable.* The project would not impair the ability of SANDAG to implement the RTP through incentives and collaborations.

Source: Dudek 2021a; see Appendix A.

As shown in Table 8-3, the project would be consistent with applicable policy objectives and strategies from the 2019 Federal RTP.

Consistency with Executive Order S-3-05 and Senate Bill 32

- **Executive Order (EO) S-3-05**. This EO establishes the following goals: GHG emissions should be reduced to 2000 levels by 2010, to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050.
- **SB 32**. This bill establishes a statewide GHG emissions reduction target whereby CARB, in adopting rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emissions reductions, shall ensure that statewide GHG emissions are reduced to at least 40 percent below 1990 levels by December 31, 2030.

CARB has expressed optimism with regard to both the 2030 and 2050 goals. It states in its First Update that "California is on track to meet the near-term 2020 GHG emissions limit and is well positioned to maintain and continue reductions beyond 2020 as required by AB 32" (Dudek 2021a). With regard to the 2050 target for reducing GHG emissions to 80 percent below 1990 levels, the First Update states the following:

This level of reduction is achievable in California. In fact, if California realizes the expected benefits of existing policy goals (such as 12,000 megawatts of renewable distributed generation by 2020, net zero energy homes after 2020, existing building retrofits under AB 758, and others) it could reduce emissions by 2030 to levels squarely in line with those needed in the developed world and to stay on track to reduce emissions to 80% below 1990 levels by 2050. Additional measures, including locally driven measures and those necessary to meet federal air quality standards in 2032, could lead to even greater emission reductions.

CARB believes that the state is on a trajectory to meet the 2030 and 2050 GHG reduction targets set forth in AB 32, EO B-30-15, and EO S-3-05. This is confirmed in the 2030 Scoping Plan, which states:

The Proposed Plan builds upon the successful framework established by the Initial Scoping Plan and First Update, while also identifying new, technologically feasibility and cost-effective strategies to ensure that California meets its GHG reduction targets in a way that promotes and rewards innovation, continues to foster economic growth, and delivers improvements to the environment and public health, including in disadvantaged communities. The Proposed Plan is developed to be consistent with requirements set forth in AB 32, SB 32, and AB 197.

The project as proposed would not interfere with implementation of any of the above-described GHG reduction goals for 2030 or 2050 because the project would result in emissions below the 900 MT CO_2e per year significance threshold. Therefore, the project would be consistent with EO S-3-05 and SB 32.

The project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

9. Hazards and Hazardous Materials

	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less than Significant Impact	No Impact
9. HAZARDS AND HAZARDOUS MATERIALS. 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 area or, where such a plan has not been adopted, within 2 miles of a public airport or a public use airport, 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?	☐	☐	☒	☐

Where relevant, the following evaluation is based upon available regulatory databases relative to hazards and hazardous materials, as well as the City of Solana Beach General Plan (2014).

DISCUSSION OF IMPACTS

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? ***Less than Significant Impact.***

The routine transport, use, and disposal of hazardous materials can result in potential hazards to the public through accidental release. Such hazards are typically associated with certain types of land uses, such as chemical manufacturing facilities, industrial processes, waste disposal, and storage and distribution facilities.

None of these uses are proposed by the project; rather, the project would consist of eight multifamily residential units and associated amenities, the construction of which would not involve the transport, use, or disposal of hazardous materials aside from those normally

associated with construction and routine maintenance activities. Limited amounts of hazardous materials would be used during construction activities (equipment maintenance, vehicle fuels, solvents, etc.). Similarly, limited amounts of hazardous materials may be used for landscape and building maintenance over the long term.

Any use of hazardous materials would occur in compliance with applicable federal, state, and local standards associated with the use, handling, and/or disposal of hazardous materials. As such, the project would not create a hazard to the public or to the environment. Impacts are considered to be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

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

Construction

Project construction activities could result in the transport, use, and disposal of hazardous materials such as gasoline fuels, asphalt, lubricants, paint, and solvents. Although care would be taken to transport, use, and dispose of small quantities of these materials by licensed professionals, there is a possibility that upset or accidental conditions may arise which could release hazardous materials into the environment. Accidental releases of hazardous materials are those releases that are unforeseen or that result from unforeseen circumstances, while reasonably foreseeable upset conditions are those release or exposure events that can be anticipated and planned for.

Project construction activities would occur in accordance with all applicable local standards adopted by the City of Solana Beach, as well as state and federal health and safety requirements intended to minimize hazardous materials risk to the public, such as California Occupational Safety and Health Administration requirements, the Hazardous Waste Control Act, the California Accidental Release Protection Program, and the California Health and Safety Code.

Stormwater runoff from the site, under both construction and post-construction development conditions, would be avoided through compliance with NPDES regulations administered by the San Diego Regional Water Quality Control Board (RWQCB). The project is required to prepare and implement a Construction General Storm Water Permit and SWPPP (refer to Section 10, Hydrology and Water Quality). The contractor would be required to implement such regulations relative to the transport, handling, and disposal of any hazardous materials, including the use of standard construction controls and safety procedures that would avoid or minimize the potential for accidental release of such substances into the environment. Standard construction practices would be observed such that any materials released are appropriately contained and remediated as required by local and state laws.

Operation

The project proposes multifamily residential uses, passive and active recreational uses, sewer/water connections, and access improvements typical of residential development. Due to their nature, these uses are not generally expected to involve the routine transport, use, or disposal of hazardous materials in substantial quantities.

Once the project is operational, hazardous material use associated with the residences, recreational uses, landscaping, and maintenance would be limited to private use of commercially available cleaning products, landscaping pesticides and fertilizers, and use of various other commercially available substances. Development of the project site is therefore anticipated to result in use of commercially available potentially hazardous materials or chemicals. The use of these substances is expected to occur in relatively small quantities and to be typical of that for residential uses and associated landscape maintenance and would be subject to applicable federal, state, and local health and safety laws and regulations intended to minimize health risk to the public. Project conformance with existing local, state, and federal regulations pertaining to the routine transport, use, storage, or disposal of hazardous materials or hazardous wastes would ensure that potential adverse effects are minimized and that such substances are handled appropriately in the event of accidental release.

For the reasons above, the project is not anticipated to create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? ***Less than Significant Impact.***

Refer to Responses 9(a) and 9(b), above. Santa Fe Christian School is located approximately 0.3 miles to the northwest on Academy Drive and St. Leo's Head Start (school) is located approximately 0.2 miles northwest of the project site at Genevieve Street. The types of uses proposed with the project include residential apartments and associated utility and landscaping improvements. Operation of residential land uses would not typically generate substantial hazardous emissions or constitute an incompatible land use within proximity to a school.

The project is therefore not anticipated to emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

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? ***No Impact.***

Records searches of the EnviroStor (California Department of Toxic Substances Control) and GeoTracker (State Water Resources Control Board) databases determined that the project site is not listed as a hazardous materials site (DTSC 2022; SWRCB 2022). The project site is not identified as containing any above- or belowground storage tanks, known contamination, or other types of potential hazards to the public. The nearest listed hazardous site is identified as a contaminated soil occurring at 533 Stevens Avenue (Kaypro, Inc.) in Solana Beach, approximately 0.4 miles northwest of the site (SWRCB 2022). Cleanup of the site has been completed and the case has been closed.

Therefore, the project would not create a significant hazard to the public or the environment in this regard. No impact would occur.

Mitigation Measures: None required.

Level of Significance: No impact.

e) For a project located within an airport land use plan area or, where such a plan has not been adopted, within 2 miles of a public airport or a public use airport, result in a safety hazard or excessive noise for people residing or working in the project area? ***No Impact.***

The project site is not located within an airport land use plan or within two miles of a public airport or public use airport. The nearest airports to the site are the Naval Air Station (NAS) Miramar located approximately 10 miles to the southeast, and the McClellan-Palomar Airport, located approximately 10 miles to the northwest. Given the distance from both airports, the project would not result in a safety hazard or excessive noise for people working or residing in the project area. No impact would occur in this regard.

Mitigation Measures: None required.

Level of Significance: No impact.

f) Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan? ***Less than Significant Impact.***

The City of Solana Beach's Fire Chief is responsible for overseeing the City's disaster preparedness program. Solana Beach's program for local emergency management is currently being prepared by the Fire Department and is anticipated to designate appropriate evacuation routes and emergency shelters. The program is also expected to identify appropriate management procedures for emergency personnel (City of Solana Beach 2014).

Emergency response is handled according to the nature of the emergency with a combination of vehicles and equipment housed at the Solana Beach fire stations and from surrounding agencies through mutual aid and automatic aid agreements, with the communities of Rancho Santa Fe, Del Mar, Encinitas, and San Diego, as well as Carlsbad, Oceanside, Vista, San Marcos, and Escondido (City of Solana Beach n.d.-e).

Emergency response actions on a regional scale are coordinated by the County of San Diego; on a statewide basis by the California Office of Emergency Services; and on a federal basis by the Federal Emergency Management Agency. The City of Solana Beach's Fire Chief is responsible for coordinating the City's emergency response actions with these agencies (City of Solana Beach n.d.-e).

The City participates in implementation of the County's Multi-Jurisdictional Hazard Mitigation Plan (MJHMP), which is intended to provide guidance for responding to emergency situations through a coordinated system of emergency service providers and facilities. The MJHMP addresses planned response to extraordinary emergency situations associated with natural disasters, technological incidents, and national security emergencies. The plan focuses on potential large-scale disasters that represent unique situations requiring unusual emergency responses. Such threats addressed by the plan include major earthquakes, dam failure, flood events, extreme heat and drought, man-made hazards, landslides, climate change, sea level rise, tsunami, and coastal storms, and other such hazards. Participants in the MJHMP include 18 cities,

the County of San Diego, 2 fire departments, and 1 municipal water district (County of San Diego 2018).

Additionally, the City participates in the Community Emergency Response Team (CERT) Program. The CERT program provides education to interested residents about disaster preparedness for hazards that may impact their area and trains them in basic disaster response skills, such as fire safety, light search and rescue, team organization, and disaster medical operations. CERT members can assist others in their neighborhood or workplace following an event when professional responders are not immediately available to help (City of Solana Beach n.d.-d).

During project construction, materials would be placed within the project boundaries to avoid any access conflicts in case of emergency evacuation. Direct access to the project site would be from Ida Avenue. Any improvements needed to provide adequate ingress/egress to/from the site would be subject to City review for the potential to interfere with emergency evacuation routes to ensure that access and circulation are maintained during the construction phase.

The project does not propose any improvements that are anticipated to obstruct or conflict with emergency response or evacuation during project operations. Additionally, the project would be subject to site plan review by City emergency services personnel (e.g., fire department) to ensure that it would not interfere with emergency response or evacuation procedures.

No revisions to emergency response operations or evacuation plans would be required as a result of the project. The provision of emergency services to the site and surrounding properties would not be impacted as primary access to all major roads would be maintained with project implementation.

Therefore, the project would not impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires? ***Less than Significant Impact.***

Refer also to Section 20, Wildfire. The project site is located in a developed urbanized area generally supporting single-family residential development. According to the California Department of Forestry and Fire Protection's (CalFire) Fire Hazard Severity Zone Map, the project site is not located in a Fire Hazard Severity Zone within a State Responsibility Area (CalFire n.d.). The site is also not identified as being located in a Very High Fire Hazard Severity Zone for a Local Responsibility Area (CalFire 2009). Similarly, all surrounding lands within the vicinity of the site are designated as having a very low risk for wildfire hazard (CalFire n.d.). Additionally, as shown on Exhibit 2, Brush Fire Hazard Areas, of the City of Solana Beach General Plan Safety Element, the project site is not identified as having the potential for brush fire risk, nor is it located within the vicinity of other lands designated as such (City of Solana Beach 2014).

Similar to existing conditions, the project would be served by the City of Solana Beach Fire Department. The nearest fire station is located at 500 Lomas Santa Fe Drive, approximately 0.83 miles northwest of the site. Existing fire protection services are adequate to serve the project as

proposed with applicant payment of the required development impact fees; no new facilities or personnel would be required as the direct result of project implementation.

Therefore, it is not anticipated that the project would expose people or structures to a significant risk of loss, injury or death involving hazardous wildland fires. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

10. Hydrology and Water Quality

	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less than Significant Impact	No Impact
10. HYDROLOGY AND WATER QUALITY. 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 off-site;	☐	☐	☒	☐
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?	☐	☐	☒	☐

Where relevant, the following evaluation is based on the *Preliminary Drainage Report* (2021; see Appendix D-1) and the *Water Quality Technical Report* (2018; see Appendix D-2) both prepared by Armstrong & Brooks Consulting Engineers.

DISCUSSION OF IMPACTS

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.***

Stormwater runoff (both dry and wet weather) generally discharges into storm drains and/or flows directly to creeks, rivers, lakes, and the ocean. Polluted runoff can have harmful effects on drinking water, recreational water, and wildlife. Stormwater characteristics depend on site

conditions, e.g., land use, impervious cover, pollution prevention, types and amounts of best management practices (BMPs), rain events (duration, amount of rainfall, intensity, time between events), soil type and particle sizes, multiple chemical conditions, the amount of vehicular traffic, and atmospheric deposition. Major pollutants typically found in runoff include sediments, nutrients, oxygen-demanding substances, heavy metals, petroleum hydrocarbons, pathogens, and bacteria.

The majority of the stormwater discharges are considered nonpoint sources and are regulated by the NPDES Municipal General Permit or Construction General Permit NPDES Permit Order No. R9-2013-0001 issued by the San Diego RWQCB. As mandated by the NPDES Order No. R9-2013-0001, the City is required to prevent and eliminate non-storm water discharges into the City's storm drain system. Construction activities disturbing one acre or more of land are subject to the permitting requirements of the NPDES General Permit for Discharges of Storm Water Runoff Associated with Construction Activity. As the project as proposed would result in disturbance to more than one acre due to grading and other infrastructure improvements, the City, as the lead agency, is required to submit a Notice of Intent to the RWQCB that covers the Construction General Permit prior to commencement of construction.

The Construction General Permit requires preparation and implementation of a water quality management plan and a SWPPP, both of which must be prepared before construction can begin. The water quality management plan outlines the project site design, source control, and treatment control of BMPs utilized throughout the life of the project. The SWPPP outlines all activities to prevent stormwater contamination, control sedimentation and erosion, and comply with Clean Water Act requirements during construction. Implementation of the SWPPP starts with the commencement of construction and continues through to the completion of the project. The SWPPP would identify site-specific construction BMPs to reduce or eliminate sediment and other pollutants in stormwater and non-stormwater runoff from the project area. Potential construction BMPs may include the following:

- Minimization of disturbed areas to the portion of the project site necessary for construction
- Stabilization of exposed or stockpiled soils and cleared or graded slopes
- Establishment of permanent landscaping as early as feasible
- Removal of sediment from surface runoff before it leaves the project site by silt fences or other similar devices around the site perimeter
- Protection of all storm drain inlets on-site or downstream of the project site to eliminate entry of sediment
- Prevention of tracking of soil through use of a gravel strip or wash facilities at exits from the project area
- Proper storage, use, and disposal of construction materials
- Continual inspection and maintenance of all specified BMPs through the duration of construction

Additionally, the project would implement BMPs in conformance with Chapter 13.10, Storm Water Management, of the City’s Municipal Code. Such storm water management regulations are intended to ensure City compliance with the NPDES Permit and with applicable federal and state

law. The City also implements its Jurisdictional Runoff Management Program (JRMP) which governs activities and programs implemented to comply with the NPDES Permit. The JRMP provides guidelines and requirements to which the City must adhere in order to comply with the NPDES Permit.

With conformance to such measures and adherence to state and local regulations, 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.

Mitigation Measures: None required.

Level of Significance: Less than significant.

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 City of Solana Beach does not utilize groundwater for consumption. Water service for the project would be supplied from the City's public water supply system rather than from groundwater, which would therefore not result in a net deficit of aquifer volume or lowering of the groundwater table. Additionally, although the project would increase the amount of Impervious surface on-site with development as proposed, such an increase would not substantially interfere with infiltration. The project also proposes installation of a perforated underground storage chamber to detain the post-development 10-year storm water runoff volumes. These flows would be detained and infiltrated into the ground.

Therefore, the project would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

c)i) 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 result in substantial erosion or siltation on-or off-site? ***Less than Significant Impact.***

Refer to Response 10(a), above. No rivers or streams are present on the project site, and therefore, no such features would be altered with the proposed development. The project would have the potential to result in additional sources of polluted runoff, including through construction and operational activities associated with the proposed residential development and access drives, as well as other on-site improvements.

Drainage improvements for the project would include installation of sump pumps in the proposed underground parking garages to capture runoff from a filtered trench storm drain inlet before conveying flows towards Ida Avenue. Drop inlet catch basins and high density polyethylene pipe (HDPE) pipe would be installed to convey flow generated on-site onto Ida Avenue. Two Filterra catch basins would be constructed on Ida Avenue to treat stormwater generated on-site. The on-site flows would then be conveyed to perforated underground storage chambers to detain the post-development 10-year volumes. These flows would be detained and infiltrated into the

ground. For storms higher than the 10-year, flows would be bypassed via overflow lines and would continue along Ida Avenue to perpetuate pre-development flow patterns and quantities. Off-site flows generated upstream of the site would be conveyed on-site via proposed v-ditches and HDPE pipe to prevent comingling with on-site flows. The proposed improvements would not substantially alter the existing drainage pattern of the site or surrounding area.

Of the 1.17-acre area to be disturbed by project improvements, approximately 0.51 acre would be impervious following project implementation. Although development of the subject property would result in the addition of impervious surfaces on-site, the project would not substantially change existing drainage patterns, nor increase the rate or volume of stormwater runoff from the subject property.

The project would prepare a SWPPP to identify relevant construction BMPs prior to issuance of grading and/or building permits. The BMPs would be implemented during the construction phase in conformance with NPDES Construction General Permit requirements and the City's BMP Design Manual to regulate storm water flows and reduce erosion. Following completion of the construction phase, all slopes modified by project improvements would be landscaped to reduce the potential for erosion to occur. Additionally, all proposed stormwater infrastructure improvements and site grading would be subject to City discretionary review and approval of a grading permit application.

With conformance to such requirements, it is not anticipated that the project would result in substantial erosion or siltation on- or off-site. Project impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

c)ii) 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 substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site? ***Less than Significant Impact.***

See Response 10(c)i., above, for project-specific discussion. The project site is not located within a 100-year flood hazard area and is therefore not susceptible to flooding (FEMA 2019). Development of the site would not substantially change drainage patterns on-site or off-site, and no increase in the rate or amount of surface runoff would occur with the project. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

c)iii) 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 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.***

See Responses 10(a) and 10(c)i., above. The project has the potential to increase stormwater runoff with development of the site, as impervious surface area would increase as compared to the current undeveloped condition. However, as noted above, stormwater runoff from the

project site would be routed to several proposed catch basins and an underground storage chamber designed to adequately accommodate stormwater runoff resulting with future development.

Additionally, the project would be required to implement a SWPPP and BMPs to ensure that stormwater quality is properly managed during the construction and operational phases. Project conformance with relevant state and local regulations would prevent substantial stormwater pollutant discharge from entering the City's existing storm drain system. Therefore, the project would not 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. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

c)iv) *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 create or contribute runoff water which would impede or redirect flood flows?* ***Less than Significant Impact.***

Refer to Responses 10(c)i and 10(c)ii, above. The project site is not in an area subject to flooding, and stormwater runoff would be accommodated by proposed on-site and off-site improvements. The project would not impede or redirect flood flows such that any off-site properties would be adversely affected by stormwater runoff from the subject site. With compliance with applicable state and local drainage regulations and standards, the project would not substantially alter the existing drainage pattern of the project site or substantially increase the rate or amount of surface runoff in a manner that would impede or redirect flood flows. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

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

As shown on Exhibit 1, Flood Zones, of the City's General Plan Safety Element, the project site is not located within a 100-year floodplain (City of Solana Beach 2014). The project site is not located near an existing dam or within a dam failure inundation zone, and is not anticipated to be susceptible to flooding events due to its location within the City.

The only areas of Solana Beach where seiches are subject to the potential for seiche occurrence are in proximity to the San Elijo Lagoon and the San Dieguito Lagoon (City of Solana Beach 2014). located approximately 2 miles north and one-half a mile south of the project site, respectively. Therefore, the project site is not considered susceptible to release of pollutants due to inundation from such an event.

The principle area of concern in Solana Beach for mudflows and tsunamis is the coastal bluff region, including City beaches (City of Solana Beach 2014). As the project site is located approximately 1 mile inland at an approximate elevation of 120 feet above mean sea level, the potential risk posed by a mudflow or tsunami event is considered to be low.

The project would not risk release of pollutants due to project inundation as the result of being located in flood hazard, tsunami, or seiche zones. No impact would occur in this regard.

Mitigation Measures: None required.

Level of Significance: No impact.

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

Refer to Responses 10(a), 10(c)i, and 10(c)iii, above. As described, the project applicant would prepare and implement an SWPPP to manage stormwater runoff during construction activities. The SWPPP would include site design and source control BMPs to ensure that stormwater runoff from impervious areas are minimized.

The project would comply with relevant state and local water quality management requirements to ensure proper treatment and management of stormwater runoff generated on the project site. Infiltration would be maintained through proposed design improvements and would implement appropriate management practices, control techniques, system design and engineering methods, and other measures as appropriate. The use of catch basins and underground storage chambers is anticipated to meet the treatment and flow control requirements for post-construction BMPs. As designed, the project would not decrease the quality or increase the quantity or runoff discharging from the project site compared to existing conditions, consistent with applicable stormwater management regulations.

Water for the project would be supplied by the City's public water system. The project would connect to an existing 8-inch water line in Ida Avenue and does not include the use of groundwater wells. Therefore, it is not anticipated that the project would conflict with or obstruct implementation of a groundwater management program.

With compliance with relevant state and local water quality and groundwater requirements, as applicable, the project would not conflict with a water quality control plan or sustainable groundwater management plan. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

11. Land Use and Planning

	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less than Significant Impact	No Impact
11. LAND USE AND PLANNING. Would the project:				
a) Physically divide an existing 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?	☐	☐	☒	☐

DISCUSSION OF IMPACTS

a) Physically divide an existing community? ***No Impact.***

The project site is an urban infill site that is surrounded by existing development on all sides and is adjacent on its eastern boundary to the southbound lanes of I-5. The site is disturbed and vacant and the project as proposed would be consistent with the underlying land use classification of Medium-High Residential in the City's adopted General Plan and Medium-High Residential zone, which would allow for potential development of 8-12 dwelling units per acre. The proposed multifamily development would therefore be consistent with existing residential uses in the area and would not result in a land use that would conflict with or disrupt surrounding development patterns.

The project does not require or propose the construction of new streets or the closure or redesign of any existing area roadways, nor would it have an adverse effect on area circulation patterns or access. Additionally, utility lines (i.e., water, sewer) would be extended into the site from existing lines currently located in the adjacent street. All utility lines serving the site would be undergrounded and would therefore not create a barrier or obstruction on-site or in the surrounding area.

For these reasons, it is not anticipated that the project would physically divide an existing community. No impact would occur in this regard.

Mitigation Measures: None required.

Level of Significance: No impact.

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? ***Less than Significant Impact.***

The project includes a request for a structure development permit and development review permit to develop eight new multifamily residential units. As stated above, the proposed use would be consistent with the existing General Plan and zoning designations that apply to the site and allow for multifamily residential development. Although City approvals would be required to

allow for the project as proposed, with such approvals, the project would not conflict with a land use plan, policy, or regulation applicable to the project site relative to land use and zoning.

Refer also to Section 4, Biological Resources, above. The City of Solana Beach's LCP/LUP does not map any of the disturbed habitat on the project site as ESHAs. As such, the project site was determined not to be subject to the ESHA protection policies, and no buffers are required as there are no ESHAs on- or off-site (Dudek 2021b). Impacts to sensitive habitat or species that would require mitigation would not occur with project implementation.

The City of Solana Beach is located within the boundaries of the San Diego Multiple Habitat Conservation Program (MHCP). The MHCP designates the City as Developed/Disturbed Land; the City is therefore exempt from the requirements to prepare a MHCP subarea plan. No other conservation plans apply to the subject site.

The project site is not located within the boundaries of an airport land use plan. No potential hazards due to land use conflicts or operations would therefore occur.

The project as proposed is consistent with applicable local and regional land use plans and policies, and as such, no significant impact would occur. Mitigation measures for potential project impacts on biological, cultural, and tribal cultural resources; geology and soils; and noise have been incorporated into this Initial Study to reduce potential environmental effects of the project to less than significant.

Therefore, the project would not 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. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

12. Mineral Resources

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

DISCUSSION OF IMPACTS

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state? ***No Impact.***

The City of Solana Beach is generally built out with urban uses that are typically incompatible with surface mining and mineral extraction activities. The project site is not currently, nor has it historically been, operated as a mineral resource site. The DOC Division of Mines and Geology does not identify the project site as a site with high potential for aggregate or mineral resources (DOC 2015). As a result, project implementation would not result in the loss of availability of a known mineral resource of value to the region or residents of the state. No impact would occur.

Mitigation Measures: None required.

Level of Significance: No impact.

b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan? ***No Impact.***

Refer to Response 12(a), above. The project site is not delineated as a locally important mineral resource recovery site. The City of Solana Beach General Plan land use map does not identify any lands within the City as being intended for purposes of mineral extraction. Therefore, 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.

Mitigation Measures: None required.

Level of Significance: No impact.

13. Noise

	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less than Significant Impact	No Impact
13. NOISE. 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 of 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 area or, where such a plan has not been adopted, within 2 miles of a public airport or a public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

The following evaluation is based upon the *Noise Technical Report* prepared by Dudek (2021d). Refer to Appendix E for additional discussion.

Existing Conditions

Sound pressure level (SPL) measurements were conducted near the project site on January 10, 2020, to quantify and characterize the existing outdoor noise levels. Three short-term noise level measurement locations (ST1–ST3) representing existing sensitive receivers were selected and are shown as ST1–ST3 on Figure 8, Noise Measurement and Modeling Locations. Primary noise sources at the sites identified in the table below consisted of freeway traffic along adjacent I-5, the sounds of leaves rustling, and birdsong. Noise measurement data is also included in Appendix A, Baseline Noise Measurement Field Data, of Appendix E of this Initial Study. These samples of daytime L_{eq} measured at the three receptor positions shown in the table below represent the community noise equivalent level (CNEL) as evening SPL would likely be 5 A-weighted decibels (dBA) less, and nighttime SPL would be 10 dBA less than the daytime values (Dudek 2021d).[3]

[3] CNEL is average A-weighted sound level as measured in decibels during a 24-hour period; dBA is the A-weighted decibel as adjusted to discriminate against low and very high frequencies in a manner approximating the sensitivity of the human ear. .

Measured Baseline Outdoor Noise Levels

Receptor	Location/Address	Date (dd.mm.yy)	Time (hh:mm)	L_{eq} (dBA)	L_{max} (dBA)
ST1	Southwestern project boundary	01.10.20	11:23 a.m. – 11:33 a.m.	59.1	73.2
ST2	Northwestern project boundary	01.10.20	11:55 a.m. – 12:05 p.m.	63.3	69.2
ST3	Eastern project boundary approximately 50 feet from I-5	01.10.20	11:45 a.m. – 11:55 a.m.	71.2	76.6

Source: Dudek 2021d; see Appendix E.
Notes: L_{eq} = equivalent continuous sound level (time-averaged sound level); L_{max} = maximum sound level during the measurement interval; dBA = A-weighted decibels; ST = short-term noise measurement locations; dd.mm.yy = date, month, year.

Thresholds of Significance

The following standards were considered in evaluating potential noise and vibration impacts resulting with construction and operation of the proposed project.

- Construction noise: The City's noise ordinance states noise from construction equipment operation shall not exceed 75 dBA for more than eight hours during any 24 hour period when measured at or within property lines of any property which is developed and used either in part or in whole for residential purposes. Construction shall only occur between the hours of 7:00 a.m. through 7:00 p.m., Monday through Friday, and after 8:00 a.m. through 7:00 p.m. on Saturday. There shall be no construction activities on Sundays, New Year's Day, Martin Luther King Day, President's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, and/or Christmas Day.
- Off-site project-attributed transportation noise: A direct roadway noise impact would be considered significant if increases in roadway traffic noise levels attributed to the project were greater than 3 dBA CNEL at an existing noise-sensitive land use.
- Off-site project-attributed stationary noise: A noise impact would be considered significant if noise from typical operation of heating, ventilation, and air conditioning and other electro-mechanical systems associated with a project exceeded 55 dBA hourly L_{eq} at the property line from 7:00 a.m. to 9:59 p.m., and 45 dBA hourly L_{eq} from 10:00 p.m. to 6:59 a.m.
- Construction vibration: Guidance from the California Department of Transportation (Caltrans) indicates that a vibration velocity level of 0.2 inches per second (ips) peak particle velocity (PPV) received at a structure would be considered annoying by occupants (Dudek 2021d). For the receiving structure, Caltrans guidance recommends that a vibration level of 0.3 ips PPV represents the threshold for building damage risk.

Although not required by CEQA, on-site traffic noise exposure levels were evaluated against the City of Solana Beach exterior and interior noise standards of 65 dBA CNEL and 45 dBA CNEL, respectively.

DISCUSSION OF IMPACTS

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 of applicable standards of other agencies?* ***Less than Significant Impact with Mitigation Incorporated.***

Short-Term Construction Noise

Construction noise and vibration are temporary in nature. Construction noise and vibration levels typically vary from hour to hour and day to day, depending on the type of equipment in use, activities performed, and distance between the source (e.g., equipment) and receptor (e.g., nearby residents).

Construction equipment used for the project is anticipated to include graders, backhoes, rubber-tired dozers, loaders, cranes, forklifts, cement mixers, pavers, rollers, and air compressors. Typical maximum noise levels for construction equipment at a distance of 50 feet are shown in Table 13-1. Construction equipment typically operates in alternating cycles of full power and low power, producing average noise levels over time that are less than the listed maximum noise level. The average sound level of construction activity also depends on the amount of time that the equipment operates and the intensity of construction activities during that time.

Table 13-1. Typical Construction Equipment Maximum Noise Levels

Equipment Type	Typical Equipment (L_{max}, dBA at 50 Feet)
Air compressor	78
Backhoe	78
Concrete pump truck	81
Grader	85
Crane	81
Dump Truck	76
Dozer	82
Generator	72
Front End Loader	79
Paver	77
Pneumatic tools	85
Water pump	77

Source: Dudek 2021d; see Appendix E.
Note: L_{max} = maximum sound level; dBA = A-weighted decibels.

Aggregate noise emissions from project construction activities was predicted at two distances to the nearest existing noise-sensitive receptor: 1) from the nearest position of the construction site boundary and 2) from the geographic center of the construction site, which serves as the time-averaged location or geographic acoustical centroid of active construction equipment for the construction phase considered. The intent of the former distance is to help evaluate anticipated construction noise from a limited quantity of equipment or vehicle activity expected to be at the boundary for some period of time, which would be most appropriate for phases such as site preparation, grading, and paving. The latter distance is used in a manner similar to the general assessment technique as described in the Federal Transportation Authority (FTA) guidance for

construction noise assessment, when the location of individual equipment for a given construction phase is uncertain over some extent of (or the entirety of) the construction site area. Because of this uncertainty, all equipment for a construction phase is assumed to operate—on average—from the acoustical centroid.

Table 13-2 summarizes these two distances to the apparent closest noise-sensitive receptor for each of the five sequential construction phases. At the site boundary, it is assumed that up to only 1 piece of equipment of each listed type per phase would be operating for a limited portion of the 8-hour period/workday. In other words, at such proximity, the operating equipment cannot "stack" or crowd the vicinity and still operate. For the acoustical centroid case, which intends to be a geographic average position for all equipment during the indicated phase, it is assumed that the equipment may be operating up to eight hours per day.

Table 13-2. Estimated Distances between Construction Activities and Nearest Noise-sensitive Receptors

Construction Phase (and Equipment Types Involved)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)*	Distance from Nearest Noise-Sensitive Receptor to Acoustical Centroid of Site (Feet)*
Site preparation (dozer, backhoe, grader)	15	300
Grading (grader, dozer, backhoe, scraper)	15	300
Building construction (crane, man-lift, generator, backhoe, scraper, welder/torch)	30	300
Architectural finishes (air compressor)	30	300
Paving (paver, roller, other equipment)	15	300

Source: Dudek 2021d; see Appendix E.
* Distances are in reference to sensitive receiver to the south.

Construction noise levels at the nearest occupied noise-sensitive land use were modeled using reference data from the Federal Highway Administration Roadway Construction Noise Model (Dudek 2021d). Input variables considered include the equipment type and number of each; the duty cycle for each piece of equipment (e.g., percentage of time within a specific time period, such as an hour, when the equipment is expected to operate at full power or capacity); and the distance from the noise-sensitive receiver, as well as how many hours such equipment may be on-site and operating (or idling) within an established work shift. No topographical or structural shielding was assumed in the modeling. Refer to Appendix B, Construction Noise Modeling Input and Output, of Appendix E for detailed data pertaining to project noise modeling. The predicted results are provided in Table 13-3 below.

Table 13-3. Predicted Construction Noise Levels per Activity Phase

Construction Phase (and Equipment Types Involved)	8-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	8-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Acoustical Centroid of Site (dBA)
Site preparation (dozer, backhoe, grader)	84.9	75.9
Grading (grader, dozer, backhoe)	84.9	75.9
Building construction (crane, man-lift, generator, backhoe, scraper welder/torch)	78.0	71.3
Architectural finishes (air compressor)	77.2	65.5
Paving (paver, roller, other equipment)	82.1	73.3

Source: Dudek 2021d; see Appendix E.
Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As shown in Table 13-3, estimated construction noise levels are predicted to be as high as 85 dBA L_{eq} over an 8-hour period at the nearest existing residences (as close as 15 feet away) when site preparation activities occur near the southern project boundary. However, such estimated noise levels at a source-to-receiver distance of 15 feet would only occur when noted pieces of heavy equipment would each operate for a cumulative period from 1 to 3 hours a day. For instances when operation of construction equipment and processes could potentially cause construction noise levels to exceed 75 dBA L_{eq} (City's daytime threshold for construction noise exposure over an 8-hour period at a residential receptor), methods identified in mitigation measure NOI-1 would be implemented to reduce such noise levels below the 75 dBA threshold.

Although nearby off-site residences would be exposed to elevated construction noise levels, the increase in noise levels would be relatively short term. It is anticipated that project construction activities would occur between 7:00 a.m. to 7:00 p.m. Monday through Friday, and 8:00 a.m. to 7:00 p.m. on Saturdays, in compliance with the City's noise ordinance.

Construction noise during allowable daytime hours would therefore have the potential to exceed the 75 dBA L_{eq} 8-hour threshold at the nearest residential receiver on occasion. Thus, temporary construction-related noise impacts would be considered potentially significant unless mitigated. With implementation of mitigation measure NOI-1, impacts would be reduced to less than significant.

Long-Term Operational Noise

Off-Site Roadway Traffic Noise

The project would generate an estimated 48 average daily vehicle trips (ADT) on local arterial roadways (i.e., Ida Avenue) that could result in increased traffic noise levels at adjacent noise-sensitive land uses. Refer also to Appendix C, Traffic Noise Modeling Input and Output, of Appendix E for traffic volume data.

The City's Noise Element establishes a 65 dBA CNEL for outdoor areas and a 45 dBA CNEL for interior areas as acceptable noise levels. Roadway traffic noise impacts are generally considered significant when they result in an increase of 3 dB above existing noise levels. An increase or decrease in noise level of at least 3 dB is required before any noticeable change in community response would be expected (Dudek 2021d).

Traffic noise levels were modeled at representative noise-sensitive receivers ST1 through ST3, as shown in Figure 8, Noise Measurement and Modeling Locations. The receivers were modeled to be 5 feet above the local ground elevation. The traffic noise model results are summarized in Table 13-4, and represented by CNEL values.

Table 13-4. Off-site Roadway Traffic Noise Modeling Results

Modeled Receiver Tag (Location Description)	Existing (2020) Noise Level (dBA CNEL)	Existing (2020) Plus Project Noise Level (dBA CNEL)	Maximum Project-Related Noise Level Increase (dB)
ST1 (Southwestern project boundary)	61.3	59.6	-1.7
ST2 (Northwestern project boundary)	64.2	61.5	-2.7
ST3 (Eastern project boundary approximately 50 feet from I-5)	69.7	64.5	-5.2

Source: Dudek 2021d; see Appendix E.
Notes: dBA = A-weighted decibel; CNEL = Community Noise Equivalent Level; dB = decibel.

As shown in Table 13-4, for all three listed representative receivers, the addition of project traffic to the roadway network would result in a CNEL increase of less than 3 dB, which is below the discernible level of change for the average healthy human ear. Additionally, construction of the buildings on-site would create sound barriers between the measurement locations and I-5 (the source of dominant acoustical contribution to the outdoor ambient sound environment), thereby resulting in a decrease in measured sound levels, as shown in the table above. As such, potential impacts from project-related off-site traffic noise increases are considered to be less than significant.

Stationary Operations Noise

Residential Unit Heating, Ventilation, and Air Conditioning Noise

Each of the new occupied residential units is anticipated to feature a split-system type air conditioning unit, with an air-cooled refrigeration (4-ton capacity) condenser unit in the patio area as currently depicted on the Site Plan; refer to Figure 3, Site Plan. Assuming each condenser unit has an SPL of 66 dBA at 3 feet based on available data from a likely manufacturer (Dudek 2021d), the condenser units would generally be installed near the patio wall in the highway-facing open space area (i.e., apparent "backyard"). As such, the closest existing noise-sensitive residential receptor to the south of the southernmost unit proposed would be as close as 40 horizontal feet to the nearest of these condenser units. However, due to the proposed privacy walls separating the residential unit patio areas, as well as the 6-foot high wall proposed along the southern property boundary, the predicted sound emission level from the combination of all 8 operating condenser units at the off-site single-family receptor would be 44 dBA $L_{eq.}$ Therefore, noise levels would be compliant with the City's nighttime threshold of 45 dBA hourly L_{eq}. Under such conditions, operation of the air conditioning units would result in a less than significant noise impact. Refer also to Appendix E for additional discussion.

Mitigation Measures:

NOI-1 Prior to and during project grading or construction, the following measures shall be implemented to demonstrate that noise levels do not exceed a 75 dBA level:

- Administrative controls (e.g., reduce operating time of equipment and/or prohibit usage of equipment type[s] within certain distances).
- Engineering controls (upgrade noise controls, such as install better engine exhaust mufflers).
- Install noise abatement on the site boundary fencing (or within, as practical and appropriate) in the form of sound blankets or comparable temporary barriers to occlude construction noise emission between the site (or specific equipment operation as the situation may define) and the noise-sensitive receptor(s) of concern.
- At the commencement of and during project grading, a noise monitor shall be on-site to ensure that noise levels at adjacent sensitive receptors are in conformance with the 75 dBA threshold.

Timing/Implementation: Prior to and during project grading or construction

Enforcement/Monitoring: City of Solana Beach Community Development Department

Level of Significance: Less than significant with mitigation incorporated.

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

Construction activities can generate varying degrees of vibration, depending on the construction procedures and the type of construction equipment used. High levels of vibration may cause physical personal injury or damage to buildings. However, vibrations rarely affect human health. Instead, construction-related vibration impacts are typically associated with building damage. The operation of construction equipment generates vibrations that spread through the ground and diminish with distance from the source. Unless heavy construction activities are conducted extremely close (within a few feet) to the neighboring structures, vibrations from construction activities rarely reach the levels that damage structures. Vibration impacts to buildings are generally discussed in terms of inches per second (ips) peak particle velocity (PPV). The maximum vibration level standard used by the California Department of Transportation (Caltrans) for the prevention of structural damage to typical residential buildings is 0.3 ips PPV.

Vibration can also be annoying and thereby impact occupants of structures. Groundborne vibration generated by construction projects is usually highest during pile driving, rock blasting, soil compacting, jack hammering, and demolition-related activities where sudden releases of subterranean energy or powerful impacts of tools on hard materials occur. Depending on the distance to a sensitive receptor, operation of large bulldozers, graders, loaded dump trucks, or other heavy construction equipment and vehicles on a construction site also have the potential to cause high vibration amplitudes. Caltrans indicates that continuous vibrations with a PPV of approximately 0.2 ips is considered annoying (Dudek 2021d).

Groundborne vibration attenuates (or lessens) rapidly, even over short distances. The attenuation of groundborne vibration as it propagates from source to receptor through intervening soils and rock strata can be estimated using Federal Transportation Authority and Caltrans guidance. For

example, for a bulldozer operating on-site and as close as the western project boundary (e.g., 15 feet from the nearest receiving sensitive land use), the estimated vibration velocity level would be 0.19 ips per the equation below (Dudek 2021d):

*PPVrcvr = PPVref * (25/D)^1.5 = 0.19 = 0.089 * (25/15)^1.5*

In the above equation, PPVrcvr is the predicted vibration velocity at the receiver position, PPVref is the reference value at 25 feet from the vibration source (the bulldozer), and D is the horizontal distance to the receiver. Therefore, at this predicted PPV, impacts resulting from vibration-induced annoyance to occupants of homes located in the project vicinity would be less than significant.

As stated, construction vibration occurring at higher levels can also cause structural damage. As shown, construction vibration associated with the proposed project is anticipated to yield levels of 0.19 ips, which do not exceed the guidance limit of 0.2 to 0.3 ips PPV for preventing damage to residential structures (Dudek 2021d). As the predicted vibration level at 15 feet would be less than the guidance limit, the potential for damage to nearby structures due to vibration is considered less than significant.

Regarding project operations, mechanical systems such as heating, ventilation, and air-conditioning units are typically designed to feature rotating (fans, motors) and reciprocating (compressors) components that are well-balanced with isolated vibration within or external to the equipment casings. Therefore, as a limited-scale residential use, project operations are not anticipated to generate high levels of groundborne vibration or groundborne noise levels from operation of on-site mechanical systems. No other substantial source of groundborne vibration or noise is anticipated with project operations.

Based on the above, the project would not result in the generation of excessive groundborne vibration or groundborne noise levels. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

c) *For a project located within the vicinity of a private airstrip or an airport land use plan area or, where such a plan has not been adopted, within 2 miles of a public airport or a public use airport, would the project expose people residing or working in the project area to excessive noise levels?* ***No Impact.***

The project site is not located within 2 miles of an active private airstrip. The project site is not located within an airport land use plan or within two miles of a public airport or public use airport. The nearest airports to the site are the Naval Air Station (NAS) Miramar located approximately 10 miles to the southeast, and the McClellan-Palomar Airport, located approximately 10 miles to the northwest.

Therefore, the project would not expose people residing or working in the project area to excessive noise levels due to airport operations. No impact would occur in this regard.

Mitigation Measures: None required.

Level of Significance: No impact.

14. Population and Housing

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

DISCUSSION OF IMPACTS

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)? ***No Impact.***

The City is currently in the process of preparing its 6th Cycle Housing Element Update for the 2021-2029 planning period. The draft Housing Element indicates that the City of Solana Beach is allocated a total of 875 housing units, including 316 units affordable to very low-income households, 159 units affordable to low-income, 160 units affordable to moderate-income, and 240 units affordable to above-moderate income (City of Solana Beach 2021).

The project is an infill development project consisting of eight multifamily residential apartments. No affordable housing units are proposed.

SANDAG's 2050 Regional Growth Forecast anticipated that the City would grow an estimated 13 percent between 2020 and 2050 (City of Solana Beach 2013). In 2020, the estimated population of the City was 13,838 residents; the average number of persons per household in the City is 2.33 (SANDAG 2021). Using this factor, the proposed development of eight multifamily units would generate an additional 19 residents. As this represents an estimated 0.14 percent of the current population (19 divided by 13,838), the project would not directly induce substantial unplanned population growth in the City or surrounding area.

The project site is located within an established, urbanized neighborhood in the City and is currently served by the existing roadway system. Direct access to the site would be from Ida Avenue with minor construction required to provide the proposed driveways into the site. All other critical infrastructure and utilities can readily be extended onto the project site from existing facilities. The project would therefore not result in the extension of new roads or other infrastructure to areas of the City not currently served by such facilities, thereby avoiding the potential to indirectly induce population growth.

Project implementation would not induce substantial unplanned population growth, either directly or indirectly. No significant impact would occur.

Mitigation Measures: None required.

Level of Significance: No impact.

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

The project would construct eight new residential rental apartment units on the subject site, which is currently in a vacant and disturbed condition. Therefore, the project would not displace substantial numbers of existing people or housing within the neighborhood. Further, because no existing homes would be displaced with project implementation, no persons would be displaced by the project, and no significant impact would occur.

Mitigation Measures: None required.

Level of Significance: No impact.

15. Public Services

	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less than Significant Impact	No Impact
15. PUBLIC SERVICES. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:				
a) Fire protection?	☐	☐	☒	☐
b) Police protection?	☐	☐	☒	☐
c) Schools?	☐	☐	☒	☐
d) Parks?	☐	☐	☒	☐
e) Other public facilities?	☐	☐	☒	☐

DISCUSSION OF IMPACTS

Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:

a) Fire protection? ***Less than Significant Impact.***

The project would be served by the City of Solana Beach Fire Department (SBFD), located at 500 Lomas Santa Fe Drive, approximately 0.9 miles northwest of the site. The SBFD provides emergency and disaster response to mitigate fire, emergency medical, hazardous materials, and other incidents within its boundaries as well as to other jurisdictions via a mutual aid agreement.

The SBFD operates three shifts with six fire department personnel per shift staffing two pieces of fire apparatus (one engine and one truck). Each apparatus is staffed with a certified fire officer, driver/operator, and firefighter (City of Solana Beach n.d.-c).

In 2009, the SBFD joined a cost-saving Cooperative Fire Management Services Agreement with the Cities of Encinitas and Del Mar. Through this agreement, Encinitas and Solana Beach senior fire staff provide oversight for the Del Mar, Encinitas, and Solana Beach fire departments. Duties include supervising fire suppression operations and emergency medical services; emergency management; fire prevention activities; purchasing of materials, supplies, and fire equipment; management of service contracts; and administrative functions. In addition, the SBFD has automatic aid agreements with the City of San Diego and the Rancho Santa Fe Fire District. The SBFD provides mutual aid to the Northern San Diego Zone, San Diego County, and as needed

throughout the State of California. In 2018, Solana Beach was recognized as an Insurance Services Organization (ISO) Class 1 Fire Department, which represents the provision of superior fire protection services (City of Solana Beach n.d.-c).

Although the project would not substantially alter the SBFD's ability to provide fire protection services to the project site, constructing eight new multifamily residences on the site would incrementally increase the demand on SBFD services, personnel, and equipment, adding new demand for emergency and non-emergency service responses. As such, the project applicant would be required to pay development impact fees in proportion to the development proposed to help fund fire protection services in the City. With the payment of such fees, the project would not result in a substantial adverse physical impact associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable fire protection service ratios, response times, or other performance objectives. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

b) Police protection? ***Less than Significant Impact.***

The San Diego County Sheriff's Department provides law enforcement and other related services to the City of Solana Beach via contract (City of Solana Beach 2014). The North Coastal Sheriff's Station located at 175 N. Camino Real in the City of Encinitas, approximately 4.2 miles north of the project site, provides law enforcement services through contract for the Cities of Del Mar, Encinitas, and Solana Beach (City of Solana Beach n.d.-g). The Sheriff's Department offers uniformed patrol, detective follow-up, traffic enforcement, accident investigation, aviation support, and administrative and supervisory functions.

The Sheriff's Department currently uses a minimum service guideline of one 24-hour patrol unit for every 13,275 residents (not including traffic enforcement) (City of Solana Beach 2014). According to the City's General Plan Safety Element, response time to priority calls to areas within the City is approximately 8.4 minutes (mean average) or 7.0 minutes (median average). Non-priority call response time is approximately 14.3 minutes (mean) or 8.0 minutes (median) (City of Solana Beach 2014).

As new development occurs over time, the Sheriff's Department maintains adequate law enforcement services by assigning additional deputies to an area in direct proportion to its increase in population. The need for augmented law enforcement services resulting from new population is therefore accommodated by increasing the number of deputies available to the City commensurate with the City's ability to pay for such services. However, the needs for increased law enforcement services can be somewhat reduced by improving the City's traffic circulation systems and by requiring new development to incorporate certain measures such as adequate lighting of exterior areas.

To compensate for costs resulting from increased demand for law enforcement services generated by the project, the applicant would be required to pay development impact fees. With the payment of such fees, the project would not result in a substantial adverse physical impact associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant

environmental impacts, in order to maintain acceptable law enforcement service ratios, response times, or other performance objectives. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

c) Schools? ***Less than Significant Impact.***

The Solana Beach School District and the San Dieguito Union High School District serve the City of Solana Beach. The Solana Beach School District has a total enrollment of approximately 3,000 students in kindergarten through sixth grade (K-6). It operates six elementary schools and a Child Development Center with programs for toddlers: Solana Vista (K-3); Skyline (4-6 and the K-6 Global Education Program); Solana Santa Fe (K-6); Carmel Creek (K-4); Solana Highlands (K-4); and Solana Pacific (5-6) schools (City of Solana Beach 2014). Two schools in the San Dieguito Union High School District serve the City: Earl Warren Middle School located at 155 Stevens Avenue in Solana Beach and Torrey Pines High located at 3710 Del Mar Heights Road in San Diego. A number of private schools also serve students in the City.

School-aged children residing in the proposed development would enroll in Skyline Elementary School (K-6) and Earl Warren Middle School (7-8), located approximately 0.9 miles and 0.8 miles (respectively) to the north of the project site, and Torrey Pines High School (9-12). Additionally, St. Leo's preschool is located 0.2 miles to the north and Santa Fe Christian School (grades PK to 12) is located 0.3 miles to the northwest of the site.

The eight multifamily residential units proposed with the project would not generate a substantial number of new school-aged children that would require educational services, nor would the need for a new school facility be triggered. To offset potential costs associated with increased enrollment in the affected school districts, the project applicant would be required to pay state-mandated school impact fees. Prior to the issuance of building permits, the project applicant would provide funding to the affected school districts in accordance with Government Code Section 65996 and Senate Bill 50. Government Code Section 65996 states that payment of development fees is deemed to be full and complete school facilities mitigation. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

d) Parks? ***Less than Significant Impact.***

The project would result in construction of eight multifamily residential units that would place incremental demands on the City's existing park and recreation facilities. The City General Plan Conservation and Open Space Element identifies the goal of providing a minimum of 3 acres of public park and recreational facilities per every 1,000 residents (City of Solana Beach 2014). Therefore, the project would result in new demand for an additional 0.001 acres of parkland.

SANDAG's 2050 Regional Growth Forecast anticipated that the City would grow an estimated 13 percent between 2020 and 2050 (City of Solana Beach 2013). In 2020, the estimated population of the City was 13,838 residents; the average number of persons per household in the City is 2.33 (SANDAG 2021). Using this factor, the proposed development of eight multifamily units would generate an additional 19 residents. As this represents an estimated 0.14 percent of the current

population (19 divided by 13,838), project implementation would not result in a substantial increase in demand on the City's parks and recreation system.

The project design includes a common open space area and playground for use by residents of the apartment community. The proposed recreation/open space area is located at the northern end of the project site and is shown in Figure 3, Site Plan, and Figure 5, Conceptual Landscape Plan. The provision of such on-site facilities would further reduce potential demands on the City to provide recreational resources for use by project residents.

As future residents of the project would use existing parks and recreational facilities in the City, the project applicant would be required to pay associated development impact fees, in compliance with Section 17.72.020 of the City's Municipal Code, which would be used toward the ongoing provision and maintenance of such facilities. Project compliance with Section 17.72.020 of the Municipal Code would ensure that the project does not result in a substantial adverse physical impact associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable park service ratios or other performance objectives. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

e) Other public facilities? ***Less than Significant Impact.***

The nearest City library to the subject site is the County of San Diego Public Library, located approximately 0.6 miles northwest at 57 Stevens Avenue. Services provided by the library include circulation of library materials such as books, magazines, and video and audio recordings; reference service; internet access; word processing stations; copy machines; children's reading programs; and workshops for children and adults, among other services.

The project would construct eight multifamily residential units whose estimated 19 residents would not be anticipated to place substantial new demands on existing City library facilities. However, the City would require that the project applicant pay development impact fees to ensure that library services remain adequate to serve the City's population over the long term. With the payment of such fees, the project would not result in a substantial adverse physical impact associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable performance objectives. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

16. Recreation

	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporation	Less than Significant Impact	No Impact
16. RECREATION				
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?	☐	☐	☒	☐

DISCUSSION OF IMPACTS

a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? ***Less than Significant Impact.***

Refer to Response 15d), above. The project would not affect any property currently zoned for recreational or open space use. The project proposes development of an eight-unit residential apartment community with on-site recreational amenities for residents to use; refer to Figure 3, Site Plan. At full buildout, the project would only generate an estimated 19 new residents, using the current SANDAG population rate of 2.33 persons per household for the City (SANDAG 2021).

Due to the limited size, location, and nature of the proposed project, negligible demand on existing recreational resources would occur. The project applicant would be required to pay associated development impact fees, in compliance with Section 17.72.020 of the City's Municipal Code, which would be used toward the ongoing provision and maintenance of the City's parks and recreational facilities. Compliance with Section 17.72.020 of the Municipal Code would ensure that the project does not result in adverse effects on the City's existing parks or other recreational facilities such that substantial physical deterioration would occur or be accelerated. As a result, impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

b) Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment? ***Less than Significant Impact****.*

Refer to Response 15d) and Response 16a), above. The project design includes a common open space area and playground for use by residents of the apartment community. The proposed recreation/open space area is located at the northern end of the project site and is shown in Figure 3, Site Plan, and Figure 5, Conceptual Landscape Plan. Additionally, the units would offer backyards, decks, and patios for resident use. Potential environmental effects resulting from

construction or operation of these recreational features have been evaluated in this Initial Study as part of the proposed development and mitigation measures have been identified as appropriate to reduce any resulting impacts. It is not anticipated that, due to the limited number of new residents generated, new or expanded off-site recreational facilities would be required to adequately serve the project.

Therefore, the project does not include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

17. Transportation

	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less than Significant Impact	No Impact
17. TRANSPORTATION. Would the project:				
a) Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☒	☐
b) Would the project conflict or be inconsistent with CEQA Guidelines Section 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?	☐	☐	☒	☐

Where relevant, the following evaluation is based upon the *Trip Generation Assessment* prepared for the project by Linscott, Law, & Greenspan (LL&G) in 2021; see Appendix F.

DISCUSSION OF IMPACTS

a) Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities? ***Less than Significant Impact.***

In the summer of 2015, the City of Solana Beach completed its Comprehensive Active Transportation Strategy (CATS) (City of Solana Beach 2015). The report, funded by a SANDAG grant, identifies the current state of active transportation facilities in Solana Beach and provides guidelines for future improvements consistent with the City's General Plan Circulation Element. The plan provides a list of areas within the City to be addressed for future improvement.

Currently, there are no existing bicycle facilities (e.g., bike lanes or bicycle parking) along the project frontage on Ida Avenue. The CATS report identifies future construction of a residential bike boulevard along Ida Avenue from Genevieve Street to Academy Drive. Additionally, the CATS identifies the same segment of Ida Avenue for unspecified traffic-calming improvements to aid pedestrian movement (City of Solana Beach 2015). These improvements are identified for near-term implementation, or generally 1-10 years following adoption of the CATS. No long-term improvements for Ida Avenue are identified in the plan. The project does not propose installation of a bike lane as part of the intended improvements.

An existing sidewalk is present to the south of the site, along the eastern side of Ida Avenue. The project proposes construction of a new 4-foot-wide sidewalk along the project frontage to connect with the existing sidewalk to the south, which would enhance pedestrian opportunities in the project vicinity. It is not anticipated that the proposed development would conflict or interfere with such existing facilities.

Several existing bus routes operated by the North County Transit District (NCTD) serve the City of Solana Beach. Route 308 (which runs to the north/west along Lomas Santa Fe Drive, San Rodolfo Drive, Stevens Avenue, Valley Avenue, and then east along Via de la Valle) is located approximately 0.23 miles west of the project site at its closest point. Route 101 (which traverses the City from its southern boundary to its northern boundary along N. Coast Highway 101) is located approximately 0.85 miles west of the site. No changes to area bus stops or operations would occur with project implementation.

The nearest transit station is at 105 N. Cedros Avenue in Solana Beach, approximately 1 mile northwest of the project site. The NCTD operates the Coaster commuter rail service in the northern and central coastal regions of San Diego County, from the City of Oceanside to downtown San Diego. The service operates primarily during weekday peak periods with limited midday, weekend, and holiday service. Additionally, the Pacific Surfliner, operated by Amtrak, is accessible from the Solana Beach train station.

As shown in Figure 3, Site Plan, no off-site roadway improvements (e.g., widening) are proposed. Minor resurfacing of Ida Avenue along the project frontage would be required once project improvements (e.g., access drives, utilities) are in place. As such, the project would not adversely impact existing or proposed transportation facilities (sidewalks, bicycle lanes, or public transportation stops). The project does not propose any features that would be inconsistent with applicable policies of the City's General Plan, CATS, or other relevant plans addressing the circulation system. Additionally, the project would not interfere with access to any existing or future rail service within the City of Solana Beach.

Therefore, 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.

Mitigation Measures: None required.

Level of Significance: Less than significant.

b) Conflict or be inconsistent with CEQA Guidelines Section 15064.3, Subdivision (b)? ***Less than Significant Impact.***

In December 2018, new guidelines were approved that shift traffic analysis from delay and operations to vehicle miles traveled (VMT) when evaluating transportation impacts under CEQA. This change in methodology is a result of SB 743, which was signed into law in September 2013. The Governor's Office of Planning and Research released a Technical Advisory (December 2018) that contains recommendations regarding assessment of VMT, thresholds of significance, and mitigation measures. Statewide implementation occurred on July 1, 2020.

A qualitative *Vehicle Miles Traveled Assessment* was prepared for the project (LL&G 2021). The City of Solana Beach has not yet adopted screening thresholds per SB 743 standards. Therefore, the Technical Advisory's Screening Thresholds for Small Projects were reviewed for the proposed project. Such thresholds indicated that projects generating fewer than 110 vehicle trips per day are not considered to result in a significant VMT transportation impact.

The eight-unit multifamily residential project would generate an estimated 48 daily vehicle trips (6 per unit), or fewer than half of the screening threshold of 110 daily vehicle trips (LL&G 2021).

Therefore the project is not anticipated to result in an impact relative to VMT. No further analysis relative to VMT is required.

The project would not conflict or be inconsistent with CEQA Guidelines Section 15064.3, Subdivision (b). Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

c) 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 project does not propose any features that would construct or modify local roadways that would potentially increase hazards. No new roadway designs or features (i.e., sharp curves, dangerous intersections, or other hazardous elements) would be required that could result in transportation-related hazards or safety concerns. As shown in Figure 3, Site Plan, no off-site road improvements are proposed; minor resurfacing of Ida Avenue along the project frontage would occur after improvements for driveway access and utilities are completed.

The project would be served by five proposed driveways along Ida Avenue. All driveways would be designed to City engineering standards to ensure that adequate sight distance is provided. Additionally, on-site structures would be set back from the roadway to ensure that views at the proposed driveways are uninhibited.

The project would result in development of the subject site with multifamily residential development. No land uses that would involve farm equipment or heavy machinery are proposed.

For the reasons above, the project would not substantially increase hazards due to a geometric design feature or incompatible uses. Impacts related to project design features would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

d) Result in inadequate emergency access? ***Less than Significant Impact.***

Project construction activities would not result in inadequate emergency access. It is anticipated that project construction activities would be staged on-site and would not interfere with emergency access to the site. The project site and vicinity are accessible via a number of existing roads, with alternative roads allowing access in the event of an emergency. Emergency vehicle access would be maintained throughout project construction in accordance with standard construction specifications. Further, construction activities would not be permitted to impede emergency access to any local roadways or surrounding properties. As appropriate, a traffic control plan would be prepared and implemented to ensure that adequate access and circulation is maintained on all surrounding streets during the project construction phase. As a result, potential impacts related to project construction activities are considered less than significant.

The project would be designed to meet City and SBFD standards for emergency access and circulation and would not alter any established emergency vehicle routes or otherwise interfere with emergency access. As mentioned previously, the project proposes multiple ingress/egress points along Ida Avenue. All access drives would be designed in accordance with City engineering

design standards to ensure safe ingress/egress to/from the site and adequate vehicular circulation. The site is not proposed to be gated, and therefore no access systems (i.e., Knox box) to allow for emergency access are proposed or required. Operational impacts are therefore considered to be less than significant.

Therefore, the project would not result in inadequate emergency access. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

18. Tribal Cultural Resources

	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less than Significant Impact	No Impact
18. TRIBAL CULTURAL RESOURCES. Would the project cause 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, that is:				
a) Listed or eligible for listing in the California Register if Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?; or,	☐	☒	☐	☐
b) 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 3024.1. In applying the criteria set for in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resources to a California Native American tribe?	☐	☒	☐	☐

The following analysis considers the findings of consultation efforts between the City of Solana Beach (lead agency) and relevant Native American tribes, pursuant to the requirements of California AB 52 (Chapter 532, Statutes of 2014), which establishes a formal consultation process for California Native American tribes as part of CEQA and equates significant impacts on tribal cultural resources with significant environmental impacts (California Public Resources Code Section 21084.2). Refer also to Appendix G which includes relevant correspondence. Additionally, relevant information from the *Cultural Resources Inventory Report* prepared for the project by Dudek (2021c; see Appendix C) has been incorporated in the discussion below, relative to Native American cultural resources.

California Public Resources Code Section 21074 defines tribal cultural resources as follows:

- Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:
    - Included or determined to be eligible for inclusion in the California Register of Historical Resources; or,
    - Included in a local register of historical resources.
- 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 California Public Resources Code Section 5024.1.

Sacred places can include Native American sanctified cemeteries, places of worship, religious or ceremonial sites, and sacred shrines. In addition, both unique and non-unique archaeological resources, as defined in California Public Resources Code Section 21083.2, can be tribal cultural resources if they meet the criteria detailed above. The lead agency relies upon substantial evidence to make the determination that a resource qualifies as a tribal cultural resource when it is not already listed in the California Register of Historical Resources or a local register.

AB 52 defines a "California Native American Tribe" as a Native American tribe located in California that is on the contact list maintained by the Native American Heritage Commission (California Public Resources Code Section 21073). Under AB 52, formal consultation with tribes is required if a tribe has requested to be informed by the lead agency of proposed projects and if the tribe, upon receiving notice of a project, accepts the opportunity to consult within 30 days of receipt of the notice. AB 52 also requires that consultation, if initiated, address project alternatives and mitigation measures for significant effects if specifically requested by the tribe.

AB 52 states that consultation is considered concluded when the parties either agree to measures to mitigate or avoid a significant effect on tribal cultural resources, or when either the tribe or the agency concludes that mutual agreement cannot be reached after making a reasonable, good-faith effort. Under AB 52, any mitigation measures recommended by the agency or agreed upon with the tribe may be included in the final environmental document and in the adopted mitigation monitoring program if they were determined to avoid or lessen a significant impact on a tribal cultural resource. If the recommended measures are not included in the final environmental document, then the lead agency must consider the four mitigation methods described in California Public Resources Code Section 21084.3. Any information submitted by a tribe during the consultation process is considered confidential and is not subject to public review or disclosure. Such information would be published in a confidential appendix to the environmental document unless the tribe consents to disclosure of all or some of the information to the public.

DISCUSSION OF IMPACTS

a) *Cause 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, that is listed or eligible for listing in the California Register if 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.***

The project site is currently undeveloped. As discussed in Section 5, Cultural Resources, the site does not support any listed or eligible historical or cultural resources, as defined by Public Resources Code Section 5020.1(k). A cultural resources inventory was conducted for the project by Dudek (2021c; Appendix C). On January 20, 2020, Dudek conducted a records search for the property at the South Coastal Information Center of the California Historical Resources Information System at San Diego State University. The search indicated that no previously recorded resources have been identified within the project area. In addition, Dudek contacted the California Native American Heritage Commission to request a search of the Sacred Lands File for the APE. The search was negative and no Native American cultural resources were identified within the project area. Additionally, the entire project area was field surveyed by Dudek and a Red Tail Native America monitor on January 28, 2020. No cultural or tribal cultural resources were identified as a result of the field survey (Dudek 2021c).

Pursuant to AB 52, the City initiated consultation by sending an initial notification letter to the Mesa Grande Band of Mission Indians on June 23, 2021; the Mesa Grande Band is the only tribe to date that has requested to be notified by the City relative to AB 52 requirements. The City did not receive a subsequent response from the tribe indicating awareness of or potential for significant tribal cultural resources to occur on-site or in the surrounding area, nor request for further consultation with the City. As such, the City considers tribal consultation requirements per

AB 52 to be concluded. Additional opportunity for area tribes to provide comment will also be afforded during the 30-day public review period for the IS/MND, pursuant to California Public Resources Code Section 21091(b).

While no specific tribal cultural resources that could be impacted by the project have been identified, mitigation measures CUL-1 to CUL-3 would be implemented to reduce potential impacts to unknown cultural resources, including any human remains; refer to Section 5, Cultural Resources. Such mitigation would also serve to protect any tribal cultural resources in the event of discovery during project-related ground disturbance activities. Therefore, with implementation of mitigation measures CUL-1 to CUL-3, potential impacts on any unknown tribal cultural resources would be reduced to less than significant.

The project would not cause a substantial adverse change in the significance of a tribal cultural resource 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). Impacts would be less than significant with mitigation incorporated.

Mitigation Measures: Implement mitigation measures CUL-1 to CUL-3.

Level of Significance: Less than significant with mitigation incorporated.

b) Cause 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, that is 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 for in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resources to a California Native American tribe? ***Less than Significant with Mitigation Incorporated.***

As noted above, no specific tribal cultural resources that could be impacted by the project have been identified. However, mitigation measures CUL-1 to CUL-3 would be implemented to reduce potential impacts to unknown tribal cultural resources, including human remains, to less than significant.

Therefore, the project would not cause substantial adverse change in the significance of a tribal cultural resource determined to be significant pursuant to criteria set forth in Public Resources Code Section 5024.1(c). Impacts would be less than significant with mitigation incorporated.

Mitigation Measures: Implement mitigation measures CUL-1 to CUL-3.

Level of Significance: Less than significant with mitigation incorporated.

19. Utilities and Service Systems

	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less than Significant Impact	No Impact
19. UTILITIES AND SERVICE SYSTEMS. Would the project:				
a) Require or result in the relocation or reconstruction of new or expanded water, wastewater treatment, or storm water drainage, electric power, natural gas, or telecommunication 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 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?	☐	☐	☒	☐

DISCUSSION OF IMPACTS

a) Require or result in the relocation or reconstruction of new or expanded water, wastewater treatment, or storm water drainage, electric power, natural gas, or telecommunication facilities, the construction or relocation of which could cause significant environmental effects? ***Less than Significant Impact.***

Water

The Santa Fe Irrigation District (SFID) and the Olivenhain Water District (OWD) provide water service to the City of Solana Beach. Local surface water is also provided from Lake Hodges, The SFID and OWD obtain most of their water supplies from the San Diego County Water Authority (SDCWA) - Metropolitan Water District system. The SDCWA imports water and sells it to member agencies. More than 90 percent of the SDCWA water supply consists of water imported from the Colorado River and northern California sources. Untreated water purchased by the SFID is treated at the R.E. Badger Filtration Plant, which is capable of treating up to 40 million gallons of water per day (mgd) and typically treats up to 7 billion gallons of potable water annually (SFID n.d.). SFID also purchases recycled water from the San Elijo Joint Powers Authority (SEJPA). The SFID currently provides approximately 500 acre feet (163 million gallons) of recycled water, or

approximately 4% of total water consumption, and plans to expand service to its customers (SFID n.d.).

The General Plan Conservation and Open Space Element estimates that future water consumption for the City of Solana Beach will occur at a rate of approximately 0.22 acre-feet per capita per year. The City's population is expected to reach an estimated 18,317 persons at General Plan buildout; therefore, annual water demand at buildout would be approximately 4,030 acre-feet (City of Solana Beach 2014). As this is less than the ultimate annual water demand of 6,116 acre-feet as projected for the City in the SFID master plan, it is anticipated that the City's future water demands would be met by the SFID (City of Solana Beach 2014).

Additionally, the SFID Urban Water Management Plan (UWMP) evaluates SFID's water reliability for the years 2025 through 2045. The plan states that the SDCWA's 2020 UWMP reports that it anticipates imported and stored water would be sufficient to meet future demands of its member agencies under the single dry year and multiple dry year scenarios when accounting for changes in local supply availability and regional demands. During drought periods, it is anticipated that SFID could purchase additional supplies from the SDCWA to supplement any reduction in local surface water supply. The SEJPA also has the capacity to increase recycled water deliveries to the SFID in the event that recycled water demands increase during drought periods. It is therefore projected that available supplies would adequately meet anticipated future demands, indicating that the SFID's water supply mix is reliable and resistant in the occurrence of drought (SFID 2021).

The project proposes construction of 8 multi-family residential units, estimated to generate 19 new residents within the Solana Beach community. The project would be served by the City's public water system via connection to an existing 8-inch water line located in Ida Avenue; refer to Figure 3, Site Plan. Due to the limited scale of the project, it is not anticipated that development as proposed would substantially increase demand on the City's existing water service facilities or generate the need for new or expanded facilities to serve the site; existing facilities would be adequate to accommodate new water demands generated by the project. Therefore, the project would not result in the relocation or reconstruction of new or expanded water-related facilities, the construction or relocation of which could cause significant environmental effects. Impacts would be less than significant in this regard.

Wastewater Treatment

The City of Solana Beach maintains the sanitary sewer system. Wastewater generated within the City is pumped to the San Elijo Water Reclamation Facility located in Cardiff for treatment and disposal. The facility currently serves that cities of Encinitas, Solana Beach, Del Mar and portions of Rancho Santa Fe and is capable of treating more than 5 million gallons per day of wastewater and stormwater. The treatment facility also supplies reclaimed water for landscape irrigation and industrial applications (City of Solana Beach n.d.). Completion of a $47 million capital improvement program that includes upgraded treatment systems is currently underway at the reclamation facility, thereby allowing it to provide enhanced wastewater treatment services (Coast News 2021).

As stated above, the project would result in the construction of 8 multi-family residential units, estimated to generate 19 new residents within the City. Minor improvements are proposed to provide connection to the City's existing public sewer system for wastewater service. Due to the limited scale of the project, it is not anticipated that the development as proposed would substantially increase demand on the City's existing wastewater treatment facilities. Existing

facilities would be adequate to accommodate new wastewater flows generated by the project. Therefore, the project would not result in the relocation or reconstruction of new or expanded wastewater treatment facilities, the construction or relocation of which could cause significant environmental effects. Impacts would be less than significant in this regard.

Storm Water

The City of Solana Beach implements a comprehensive storm water pollution prevention program. As mandated by the NPDES Permit Order No. R9-2013-0001 issued by the RWQCB, the City is required to prevent and eliminate non-storm water discharges into the City's storm drain system.

There are no existing storm drain improvements or discharge locations on-site. Proposed stormwater improvements include installation of sump pumps, drop inlet catch basins, and/or HDPE pipe that would convey flows towards Ida Avenue. Filterra catch basins would be constructed on Ida Avenue to treat stormwater generated on-site. The on-site flows would then be conveyed to perforated underground storage chambers to detain the post-development 10-year volumes. These flows would be detained and infiltrated into the ground. Two under sidewalk discharge locations located on Ida Avenue adjacent to the project's northwesterly and southwesterly boundary are also proposed.

Best management practices (BMPs) would be implemented during construction consistent with the requirements of the NPDES Permit and the City's BMP Design Manual to control storm water quality and the potential for erosion. The project has been designed in accordance with local and state regulations pertaining to the management of runoff (e.g., no increase in rate or volume for undeveloped versus developed condition) and for the treatment of stormwater on-site. Refer also to Section 10, Hydrology and Water Quality, and Appendices D-1 and D-2. Project improvements related to storm water are not anticipated to result in a significant environmental effect.

Cable/Electricity/Gas/Internet

City of Solana Beach residents receive cable and internet service from either Cox Communication or Time Warner Cable (City of Solana Beach n.d.) and natural gas and electricity service from SDG&E) (City of Solana Beach n.d.). Such services are currently available within the surrounding neighborhood and would be extended to the subject property to serve future residents. Provision of such services to the subject site would not result in a significant environmental effect.

The project would therefore not require or result in the relocation or reconstruction of new or expanded water, wastewater treatment, or storm water drainage, electric power, natural gas, or telecommunication facilities, the construction or relocation of which could cause significant environmental effects. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

b) 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.***

Refer to Response 19a), above. As stated above, the SFID's water supply portfolio includes water purchased from the SDCWA, local surface water from Lake Hodges, and recycled water purchased from the SEJPA. The SFID's 2021 UWMP presents an assessment of water reliability for future years 2025 through 2045. Consistent with the UWMP Act requirements, a comparison of total

projected water supply to total projected water demands in five-year increments over the next 20 years is provided for the normal water year, single dry year, and multiple dry year scenarios.

As indicated above, through continued use of existing supplies and opportunities to supplement water supplies during periods of drought (e.g., through purchase from SDCWA or through increased purchase of recycled water from SEJPA), it was concluded that projected available supplies would meet anticipated demands, demonstrating that the SFID's water supply mix is "reliable and drought resilient" (SFID 2021).

In conformance with current requirements, the SFID also prepared a drought risk assessment (DRA) to compare supplies and demands over a five-year consecutive dry period, or extended drought. The SFID's DRA, evaluated for the years 2021 to 2025, assumed that the SFID could purchase additional supplies from the SDCWA to supplement reductions. The DRA concluded that projected available water supplies would meet anticipated demands, thereby further demonstrating a reliable water supply under such conditions (SFID 2021).

Therefore, the existing and future water supply is considered adequate to accommodate the increased population and associated water demand anticipated with the proposed project. Development of new 8 multi-family units would not substantially affect the SFID's ability to meet anticipated future water demands, or to supply water to the agencies it serves, during both normal and drought conditions.

The project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

c) *Result in 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.***

Refer to Response 19a), above, for additional discussion. The project would result in development of 8 multi-family units. Due to the limited scale of the project, the resulting residential uses would not substantially increase demand on existing wastewater treatment facilities serving the City. Therefore, the project would not result in 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. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

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?* ***Less than Significant Impact.***

Assembly Bill (AB) 939 established the California Integrated Waste Management Act of 1989 (PRC Sections 42900–42927) which required all California cities and counties to reduce the volume of solid waste deposited in landfills by 50 percent by the year 2000. It also requires that cities and

counties continue to remain at 50 percent or higher for each subsequent year. The act is intended to reduce, recycle, and reuse solid waste generated to the maximum extent feasible.

The act requires each California city and county to prepare, adopt, and submit to the California Department of Resources Recycling and Recovery (CalRecycle) a source reduction and recycling element that demonstrates how the jurisdiction will meet the act's mandated diversion goals. Each jurisdiction's SRRE must include specific components as defined in PRC Sections 41003 and 41303. In addition, the SRRE must include a program for management of solid waste generated in the jurisdiction consistent with the following hierarchy: (1) source reduction; (2) recycling and composting; and (3) environmentally safe transformation and land disposal. The SRRE is required to emphasize and maximize the use of all feasible source reduction, recycling, and composting options in order to reduce the amount of solid waste to be disposed of by transformation and land disposal (PRC Sections 40051, 41002, and 41302).

The City of Solana Beach has exclusive franchise agreements with EDCO Waste and Recycling Services for all solid waste collection and recycling services (City of Solana Beach n.d.-b). The City also implements a recycling program at its Public Works Yard where asphalt, concrete, steel, metal, plastic, glass, aluminum, and green waste generated at City facilities and public construction and maintenance projects is accepted. Through such programs, the overall diversion rate for the City, including residential, commercial, industrial, and municipal uses, has increased over the past decade in conformance with the requirements of AB 939 and other similar regulations (City of Solana Beach n.d.-b).

The City implements its Construction and Demolition Debris Recycling Ordinance (Chapter 6.36 of the City Municipal Code) which requires all demolition permits and construction projects with a minimum $100,000 valuation to recycle at least 50% of debris generated by the project. The project applicant is responsible for submitting a waste management plan prior to receiving a demolition or building permit. The waste management plan would be required to identify the amount of waste generated during construction and methods by which it would be disposed of and/or recycled. Final project approval is not granted until the applicant provides evidence that a minimum of 50% (with a goal of 65%) of the construction debris generated was recycled.

It is anticipated that construction debris would be disposed of at EDCO's Construction, Demolition, and Inert Recycle Facility located at 224 South Las Posas Road in the City of San Marcos. Solid waste generated during project operations would be limited due to the number of units proposed. The project would enable the collection and sorting of solid waste materials for diversion in order to ensure compliance with statewide mandates and reduce waste delivered to area landfill(s).

Additionally, in October of 2014, California adopted Assembly Bill 1826, requiring all businesses to recycle their organic waste materials on and after April 1, 2016. Apartment and condominium complexes of 5 units or more are also required to recycle organic waste which includes green waste/landscape materials and non-hazardous wood waste. Multi-family complexes are not required to have a food waste diversion program; however, those with 5 or more units generating enough landscape related organics are required to recycle those organics (City of Solana Beach n.d.). As appropriate, the project would comply with such regulations to ensure proper recycling of organic wastes generated on-site from ongoing landscape planting and maintenance activities,

The City also supports an e-waste program for recycling of electronics (i.e., televisions, computers, etc.). Residents can dispose of their e-waste through the same program as common household

waste products (with payment of an established fee), with the same parameters applying to both programs (City of Solana Beach n.d.-b).

With conformance to such regulations and measures, and with consideration for the limited number of residential units proposed, the project would not 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. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste? ***Less than Significant Impact.***

Refer to Response 19d), above, for additional discussion. The project would be served by an existing waste hauler (EDCO) which operates consistent with federal, state, and local statutes and regulations for solid waste management and recycling. Measures would be implemented during project construction and operation to ensure compliance with applicable regulations pertaining to management and reduction of construction debris, as well as solid and organic waste over the long term.

The project would comply with federal, state, and local management and reduction statutes and regulations related to solid waste. Impacts would be less than significant in this regard.

Mitigation Measures: None required.

Level of Significance: Less than significant.

20. Wildfire

	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less than Significant Impact	No Impact
20. WILDFIRE. 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?	☐	☐	☒	☐

DISCUSSION OF IMPACTS

a) Substantially impair an adopted emergency response plan or emergency evacuation plan? ***Less than Significant Impact****.*

Refer to Response 9(f), under Hazards and Hazardous Materials, above, for a detailed discussion of emergency response and evacuation operations implemented within the City of Solana Beach. The project does not propose any improvements that are anticipated to obstruct or conflict with emergency response or evacuation during project construction or operations. Additionally, the project would be subject to site plan review by City emergency services personnel (e.g., fire department) to ensure that it would not interfere with emergency response or evacuation procedures. No revisions to emergency response operations or evacuation plans would be required as a result of the project. Additionally, the provision of emergency services to the site and surrounding properties would not be impacted as primary access to all major roads would be maintained with project implementation.

The project would not substantially impair an adopted emergency response plan or emergency evacuation plan. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

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? ***Less than Significant Impact.***

The area where development is proposed on-site is generally flat. However, limited steep slopes are present in the westernmost portion of the site, generally adjacent to Ida Avenue.

Within the San Diego Air Basin, in which the project site lies, the interaction of ocean, land, and the Pacific High influences the direction of prevailing winds (westerly to northwesterly). Winds tend to blow onshore during the day and offshore at night. Local terrain is often the dominant factor inland and winds in inland mountainous areas tend to blow through the valleys during the day and down the hills and valleys at night. In the fall, the air basin is often impacted by Santa Ana winds, which are the result of a high-pressure system over the Nevada and Utah regions that overcomes the westerly wind pattern and forces hot, dry winds from the east to the Pacific Ocean. It is anticipated that the risk for large catastrophic wildfires driven by Santa Ana wind events will likely increase as a result of ongoing climate change, with drier autumns leading to low antecedent precipitation before the height of the Santa Ana wind season (December and January) (Dudek 2021a). Due to the project location within proximity to the coastline, prevailing winds are not anticipated to substantially exacerbate the risk of wildfire occurrence or expose project occupants to the uncontrolled spread of a wildfire beyond that which occurs under existing conditions.

According to CalFire's Fire Hazard Severity Zone Map, the project site is not located in a Fire Hazard Severity Zone within a State Responsibility Area (CalFire n.d.). The site is also not identified as being located in a Very High Fire Hazard Severity Zone for a Local Responsibility Area (CalFire 2009). Similarly, all surrounding lands within the vicinity of the site are designated as having a very low risk for wildfire hazard (CalFire n.d.). Additionally, as shown on Exhibit 2, Brush Fire Hazard Areas, of the City of Solana Beach General Plan Safety Element, the project site is not identified as having the potential for brush fire risk, nor is it located within the vicinity of other lands designated as such (City of Solana Beach 2014).

On-site landscaping for visual enhancement purposes is proposed for the project. However, such plantings would not substantially exacerbate wildfire risks or the potential for uncontrolled spread of wildfire in the area.

Therefore, as the potential for wildfire to occur on-site is considered to be low, the project would not exacerbate wildfire risks or expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

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? ***No Impact.***

The installation or maintenance of associated infrastructure (such as roads, fuel breaks, power lines, or other utilities) that may exacerbate fire risk would not occur with the project as proposed. No new roadways are proposed and utility infrastructure is currently available in the immediate project vicinity. Additionally, the SBFD, as part of the City's discretionary review process, would review all project plans to ensure that adequate fire suppression and emergency access and

evacuation routes are maintained and potential damage from or risk of fire is minimized. Adherence to local design standards and regulations relative to fire risk and prevention would ensure that no impact occurs in this regard.

Mitigation Measures: None required.

Level of Significance: No impact.

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****.*

Refer to Response 20(b), above. The project site is relatively flat, with exception of limited slopes in the westernmost portion of the site adjacent to Ida Avenue. No slopes that may be subject to slope instability, flooding, or landslides after a fire event are present, nor are such conditions present on adjoining lands.

The project would be subject to requirements of the CBC, which identifies structural requirements for existing and new buildings and is intended to ensure structural integrity during seismic and other hazardous events (e.g., landslides), as well as preventing injury, loss of life, and substantial property damage. To ensure the protection of public safety, all planned development in Solana Beach is subject to CBC requirements. Additionally, development of the site as proposed would not result in a substantial change in stormwater runoff quantities or rates from the site. Due to the limited scale of the proposed development, combined with conformance to local and other applicable design standards to address on-site drainage and stormwater runoff, the project is not anticipated to result in downslope or downstream flooding.

As designed, and with conformance to adopted regulations intended to maintain public safety, the project would not expose people to flooding or landslides as a result of runoff, post-fire slope instability, or drainage changes. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

21. Mandatory Findings of Significance

	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less than Significant Impact	No Impact
21. MANDATORY FINDINGS OF SIGNIFICANCE.				
a) Does 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 rare or endangered plants or animals, or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? "Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects?	☐	☐	☒	☐
c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

DISCUSSION OF IMPACTS

a) Does 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 rare or endangered plants or animals, or eliminate important examples of the major periods of California history or prehistory? ***Less than Significant Impact with Mitigation Incorporated.***

The analysis provided herein determined that the project has the potential to directly or indirectly impact nesting birds. Mitigation requiring preconstruction biological surveys and construction worker education would be implemented to ensure potential impacts are reduced to less than significant. Refer to mitigation measure BIO-1 in Section 4, Biological Resources. Additionally, mitigation measures CUL-1 to CUL-3 would be implemented to ensure that project impacts to unknown cultural and/or tribal cultural resources, including human remains, are reduced to less than significant; refer to Section 5, Cultural Resources, and Section 18, Tribal Cultural Resources.

With the incorporation of such mitigation measures, 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 rare or endangered

plants or animals, or eliminate important examples of the major periods of California history or prehistory. Impacts would be less than significant with mitigation incorporated.

Mitigation Measures: Implement mitigation measures BIO-1 and CUL-1 to CUL-3.

Level of Significance: Less than significant with mitigation incorporated.

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

A cumulative impact could occur if the project would result in an incrementally considerable contribution to a significant cumulative impact in consideration of past, present, and reasonably foreseeable future projects for each resource area. No direct significant impacts were identified for the proposed project that could not be mitigated to a less than significant level. However, when combined with other projects within the vicinity, the project may result in a contribution to a potentially significant cumulative impact.

The project does not include any agricultural resources that could be impacted, and the project would have no effect on minerals or population and housing. In addition, a less than significant finding was determined (with or without mitigation incorporated) for aesthetics, air quality, energy, geology and soils, GHG emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, public services, recreation, transportation, utilities and service systems, and wildfire. As a result, cumulative impacts related to these resources would not occur.

Biological resources, cultural resources, and tribal cultural resources impacts that are generated by construction activities would be short term and limited by a temporary construction period. Mitigation measures are proposed to reduce project impacts to less than significant. As a result of the evaluation provided herein, there is no substantial evidence that, after mitigation, there are cumulative effects associated with the proposed project. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly? ***Less than Significant Impact.***

In the evaluation of environmental impacts in this Initial Study, the potential for adverse direct or indirect impacts to human beings were considered in the response to certain questions in the following sections: aesthetics; air quality; geology and soils; hazards and hazardous materials; hydrology and water quality; noise; population and housing; and transportation. As a result of this evaluation, no potentially environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly, were identified. Impacts would be less than significant.

Mitigation Measures: None required.

Level of Significance: Less than significant.

4.0 DOCUMENT PREPARERS AND REFERENCES

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Appendix A
Air Quality/Greenhouse Gas Emissions Technical Report

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Air Quality and Greenhouse Gas Emissions Analysis Technical Report for the Ida Avenue Apartments Project City of Solana Beach, California

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MARCH 2021

Printed on 30% post-consumer recycled material.

Table of Contents

SECTION PAGE NO.

EXECUTIVE SUMMARY v

1 INTRODUCTION 1
1.1 Report Purpose and Scope 1
1.2 Project Location 1
1.3 Project Description 1
1.4 Project Design Features 1
1.5 Dust Control Strategies 2

2 AIR QUALITY 7
2.1 Environmental Setting 7
2.1.1 Climate and Meteorology 7
2.1.2 Pollutants and Effects 8
2.1.3 Sensitive Receptors 13
2.2 Regulatory Setting 13
2.2.1 Federal Regulations 13
2.2.2 State Regulations 14
2.2.3 Local Regulations 17
2.3 Regional and Local Air Quality Conditions 20
2.3.1 San Diego Air Basin Attainment Designation 20
2.3.2 Air Quality Monitoring Data 21
2.4 Significance Criteria and Methodology 23
2.4.1 Thresholds of Significance 23
2.4.2 Approach and Methodology 24
2.5 Impact Analysis 28
2.5.1 Threshold 1 28
2.5.2 Threshold 2 29
2.5.3 Threshold 3 32
2.5.4 Threshold 4 36

3 GREENHOUSE GAS EMISSIONS 39
3.1 Environmental Setting 39
3.1.1 Climate Change Overview 39
3.1.2 Greenhouse Gases 39
3.1.3 Global Warming Potential 41
3.2 Regulatory Setting 42
3.2.1 Federal Regulations 42
3.2.2 State Regulations 44
3.2.3 Local Regulations 55

3.3 Greenhouse Gas Inventories and Climate Change Conditions 56
3.3.1 Sources of Greenhouse Gas Emissions 56
3.3.2 Potential Effects of Climate Change 57
3.4 Significance Criteria and Methodology 61
3.4.1 Thresholds of Significance 61
3.4.2 Approach and Methodology 63
3.5 Impact Analysis 65
3.5.1 Threshold 1 65
3.5.2 Threshold 2 66

4 REFERENCES CITED 70

5 LIST OF PREPARERS 76

APPENDIX

A CalEEMod Output Files

FIGURE

1 Project Location 3

TABLES

1 Ambient Air Quality Standards 14
2 San Diego Air Basin Attainment Classification 21
3 Local Ambient Air Quality Data 22
4 SDAPCD Air Quality Significance Thresholds 23
5 Construction Scenario Assumptions 25
6 Estimated Maximum Daily Construction Criteria Air Pollutant Emissions – Unmitigated 30
7 Estimated Maximum Daily Operational Criteria Air Pollutant Emissions – Unmitigated 31
8 Pollutants, Sources, Health Effects, and Attainment Status 34
9 Greenhouse Gas Emissions Sources in California 57
10 Estimated Annual Construction Greenhouse Gas Emissions 65
11 Estimated Annual Operational Greenhouse Gas Emissions 66
12 San Diego Forward: The Regional Plan Consistency Analysis ..... **Error! Bookmark not defined.**

Acronyms and Abbreviations

Acronym/Abbreviation	Definition
AB	Assembly Bill
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CALGreen	California's Green Building Standards
CalRecycle	California Department of Resources Recycling and Recovery
CAP	climate action plan
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CFC	chlorofluorocarbon
CH_4	methane
City	City of Solana Beach
CNRA	California Natural Resources Agency
CO	carbon monoxide
CO_2	carbon dioxide
County	San Diego County
CPUC	California Public Utilities Commission
DPM	diesel particulate matter
EIR	environmental impact report
EO	Executive Order
EPA	U.S. Environmental Protection Agency
g/l	grams per liter
GHG	greenhouse gas
GWP	global warming potential
HAP	hazardous air pollutant
HCFC	hydrochlorofluorocarbon
HFC	hydrofluorocarbon
MMT	million metric ton
MPO	Metropolitan Planning Organization
MT CO_2e	metric tons of CO_2 equivalent
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NHTSA	National Highway Traffic Safety Administration
NO_2	nitrogen dioxide
NO_x	oxides of nitrogen
O_3	ozone
PDF	project design feature
PFC	perfluorocarbon
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to 10 microns
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to 2.5 microns
RAQS	Regional Air Quality Strategy
RPS	Renewables Portfolio Standard
RTIP	Regional Transportation Improvement Program

Acronym/Abbreviation	Definition
RTP	Regional Transportation Plan
SANDAG	San Diego Association of Governments
SB	Senate Bill
SDAB	San Diego Air Basin
SCS	Sustainable Communities Strategy
SDAPCD	San Diego County Air Pollution Control District
SDG&E	San Diego Gas & Electric
SF_6	sulfur hexafluoride
SIP	state implementation plan
SLCP	short-lived climate pollutant
SO_2	sulfur dioxide
SO_x	sulfur oxides
TAC	toxic air contaminant
VOC	volatile organic compound

Executive Summary

The purpose of this technical report is to assess the potential air quality and greenhouse gas (GHG) emissions impacts associated with implementation of the proposed Ida Avenue Apartments Project (project). This assessment utilizes the significance thresholds in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.).

Project Overview

The project site is located along the east side of Ida Avenue in the City of Solana Beach (City) in San Diego County, California. The 1.44-acre site is generally located west of Interstate 5. The project site is located north of the 734 Ida Avenue property. The Pacific Ocean is approximately 1.05 miles to the west. The project involves the construction of an 8-unit apartment development and associated parking.

The project site is located within the San Diego Air Basin and is under the jurisdiction of the San Diego County Air Pollution Control District (SDAPCD). Construction and operational criteria air pollutant and GHG emissions were estimated using the California Emissions Estimator Model (CalEEMod) Version 2016.3.2.

Air Quality

The air quality impact analysis evaluated the potential for adverse impacts to air quality due to construction and operational emissions resulting from the project. Impacts were evaluated for their significance based on the SDAPCD mass daily criteria air pollutant thresholds of significance (SDAPCD 2016a).[1] Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. Criteria air pollutants include ozone, nitrogen dioxide, carbon monoxide (CO), sulfur dioxide, particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM_{10}), particulate matter with an aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$), and lead. Pollutants evaluated include volatile organic compounds (VOCs) (also referred to as reactive organic gases), oxides of nitrogen (NO_x), CO, sulfur oxides (SO_x), PM_{10}, and $PM_{2.5}$. VOCs and NO_x are important because they are precursors to ozone.

Air Quality Plan Consistency

If a project involves development that is greater than that anticipated in the local plan and San Diego Association of Governments (SANDAG) growth projections, the project might be in conflict with the state implementation plan and Regional Air Quality Strategy and may contribute to a potentially significant cumulative impact on air quality. The project was deemed to be consistent with the 2016 Regional Air Quality Strategy, which is the current air quality plan, because the project is consistent with the zoning designation and is anticipated in the local plan and SANDAG's growth projections.

[1] For CEQA purposes, the screening criteria can be used as quantitative methods to demonstrate that a project's total emissions would or would not result in a significant impact to air quality.

Construction Criteria Air Pollutant Emissions

Construction of the project would result in the temporary addition of pollutants to the local airshed caused by on-site sources (i.e., off-road construction equipment, soil disturbance, and VOC off-gassing) and off-site sources (i.e., vendor trucks and worker vehicle trips). The project's construction emissions were estimated using CalEEMod. Maximum daily construction emissions of VOC, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$ would not exceed SDAPCD's significance thresholds. Therefore, the project would have a less-than-significant impact during construction.

Operational Criteria Air Pollutant Emissions

The project would generate criteria pollutant emissions during operation from area, energy, and mobile sources. The emissions were estimated using CalEEMod and compared to SDAPCD's significance thresholds for operation. The project did not exceed the mass emissions significance thresholds for VOC, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$ during operation. Therefore, the project would have a less-than-significant impact.

Cumulative Impacts

The nonattainment status of regional pollutants is a result of past and present development, and SDAPCD develops and implements plans for future attainment of ambient air quality standards. Based on these considerations, project-level thresholds of significance for criteria pollutants are relevant in the determination of whether a project's individual emissions would have a cumulatively significant impact on air quality. As discussed above, the project would not exceed SDAPCD's mass daily significance thresholds during construction or operation; therefore, the project would have a less-than-significant cumulative impact.

Exposure of Sensitive Receptors

Construction and operational activities would not generate emissions in excess of SDAPCD's mass daily thresholds; therefore, construction and operational impacts during construction of the project would be less than significant. In addition, diesel equipment would also be subject to the California Air Resources Board Airborne Toxic Control Measures for in-use off-road diesel fleets, which would minimize diesel particulate matter emissions. The duration of proposed construction activities (approximately 11 months) would only constitute a small percentage of the total long-term 30-year exposure period and would not result in exposure of proximate sensitive receptors to substantial toxic air contaminants. After construction is complete, there would be no long-term source of toxic air contaminant emissions during operation. The project would not expose sensitive receptors to valley fever and would comply with SDAPCD Rule 55 to help reduce impacts during grading/earth-moving activities. The project would not negatively affect the level of service of intersections on the project site and would not significantly contribute to a CO hotspot. As such, potential project-generated impacts associated with CO hotspots would be less than significant.

Other Emissions

Potential odors produced during construction would be attributable to concentrations of unburned hydrocarbons from tailpipes of construction equipment, architectural coatings, and asphalt pavement application, which would disperse rapidly from the project site and generally occur at magnitudes that would not affect substantial numbers of people. Impacts associated with odors during construction would be less than significant. The project entails a residential development and would not result in the creation of a land use that is commonly associated with odors. Therefore, project operations would result in less-than-significant impacts to other emissions (such as those leading to odors).

Greenhouse Gas Emissions

This GHG emissions analysis evaluates the potential for the project to generate GHG emissions during construction and operation that may have a significant impact on the environment, and the potential for the project to conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. Principal GHGs regulated under state and federal law include carbon dioxide (CO_2), methane, and nitrous oxide. GHG emissions are measured in metric tons of CO_2 equivalent (MT CO_2e), which account for weighted global warming potential factors for methane and nitrous oxide. Estimated annual project-generated emissions at full buildout in 2023 include area, energy, mobile, solid waste, and water/wastewater emissions sources, as well as amortized construction emissions.

Potential to Generate Significant GHG Emissions

Construction of the project would result in GHG emissions primarily associated with the use of off-road construction equipment, vendor (material delivery) trucks, and worker vehicles. Total project-generated GHG emissions during construction were estimated to be 248 MT CO_2e, or 8 MT CO_2e per year when amortized over 30 years.

The project would generate operational GHG emissions from area sources (landscape maintenance equipment), energy sources (natural gas and electricity consumption), mobile sources (vehicle trips), water supply and wastewater treatment, and solid waste. Estimated annual project-generated operational GHG emissions at buildout in 2023 plus amortized project construction emissions would be approximately 78 MT CO_2e per year. Thus, the project's estimated GHG emissions would not exceed the 900 MT CO_2e per year significance threshold and the project's GHG emissions would be less than significant.

Consistency with Applicable Greenhouse Gas Reduction Plans

The project was shown to be consistent with SANDAG's 2019 Federal RTP, the City's General Plan, and the goals of Senate Bill 32 and Executive Order S-3-05. Therefore, the project would not conflict with an applicable plan adopted for the purpose of reducing GHG emissions, and plan consistency impacts would be less than significant.

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1 Introduction

1.1 Report Purpose and Scope

The purpose of this technical report is to assess the potential air quality and greenhouse gas (GHG) emissions impacts associated with implementation of the proposed Ida Avenue Apartments Project (project). This assessment uses the significance thresholds in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.), and is based on the emissions-based significance thresholds recommended by the San Diego County Air Pollution Control District (SDAPCD) and other applicable thresholds of significance.

This introductory section provides a description of the project and the project location. Section 2, Air Quality, describes the air quality–related environmental setting, regulatory setting, existing air quality conditions, and thresholds of significance and analysis methodology, and presents an air quality impact analysis per Appendix G of the CEQA Guidelines. Section 3, Greenhouse Gas Emissions, follows the same format as Section 2 and similarly describes the GHG emissions–related environmental setting, regulatory setting, existing climate changes conditions, and thresholds of significance and analysis methodology, and presents a GHG emissions impact analysis per Appendix G of the CEQA Guidelines. Section 4, References Cited, includes a list of the references cited. Section 5, List of Preparers, includes a list of those who prepared this technical report.

1.2 Project Location

The project site is located along the east side of Ida Avenue in the City of Solana Beach (City) in San Diego County (County), California. The 1.44-acre site is generally located west of Interstate 5. The project site is located north of the 734 Ida Avenue property. The Pacific Ocean is approximately 1.05 miles to the west. Project location is shown in Figure 1.

1.3 Project Description

The project involves the construction of an 8-unit apartment development and associated parking on 0.94 acres and grading off-site of the California Department of Transportation (Caltrans) Right of Way (ROW) as shown in Figure 2.

1.4 Project Design Features

To reduce impacts to the extent feasible, the project would incorporate the following project design features (PDFs) into the new development Conditions of Approval.

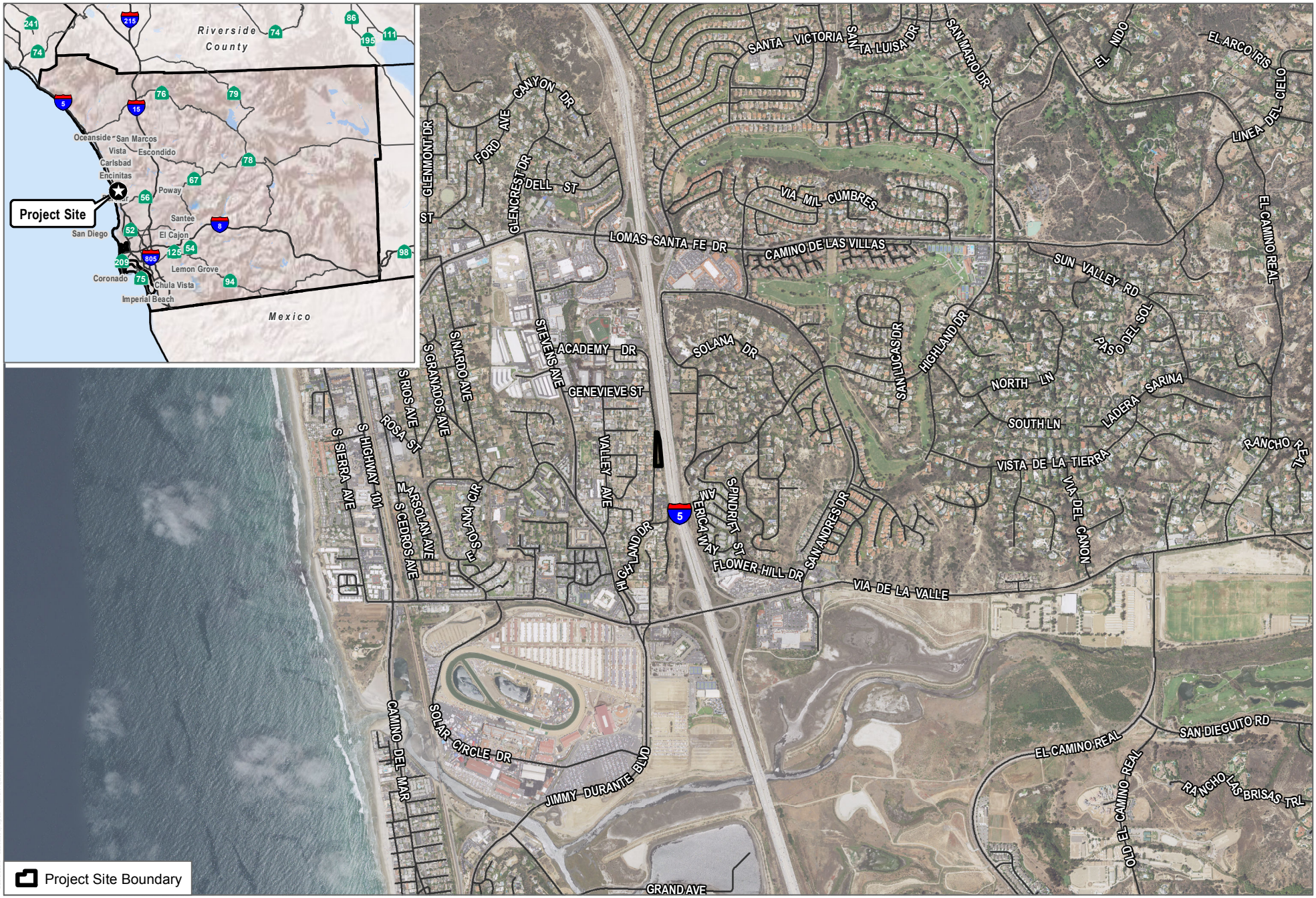
PDF-AQ-1 **Architectural Coating.** Low-volatile organic compound (VOC) paints shall be used in the interior and exterior of the residential buildings to meet a VOC content of 5 grams per liter or less and 50 grams per liter or less, respectively.

PDF-AQ-2 **Wood Burning Stoves and Fireplaces.** No wood burning stoves or natural gas fireplaces shall be constructed.

1.5 Dust Control Strategies

The project would include various construction dust control strategies as a PDF that would be subject to SDAPCD Rule 55. Compliance with these dust control measures would be identified on grading plan approvals. **PDF-AQ-3** provides for dust control strategies:

a. Active construction areas on site shall be watered at least two times daily.
b. Speeds on unpaved roads shall be reduced to less than 15 miles per hour.
c. All grading and excavation operations shall be halted when wind speeds exceed 25 miles per hour.
d. Dirt and debris spilled onto paved surfaces at the project site and on the adjacent roadways shall be swept, vacuumed, and/or washed at the end of each workday.
e. All trucks hauling dirt, sand, soil, or other loose material to and from the construction site shall be covered and/or a minimum 2 feet of freeboard shall be maintained.



SOURCE: NAIP 2016

DUDEK

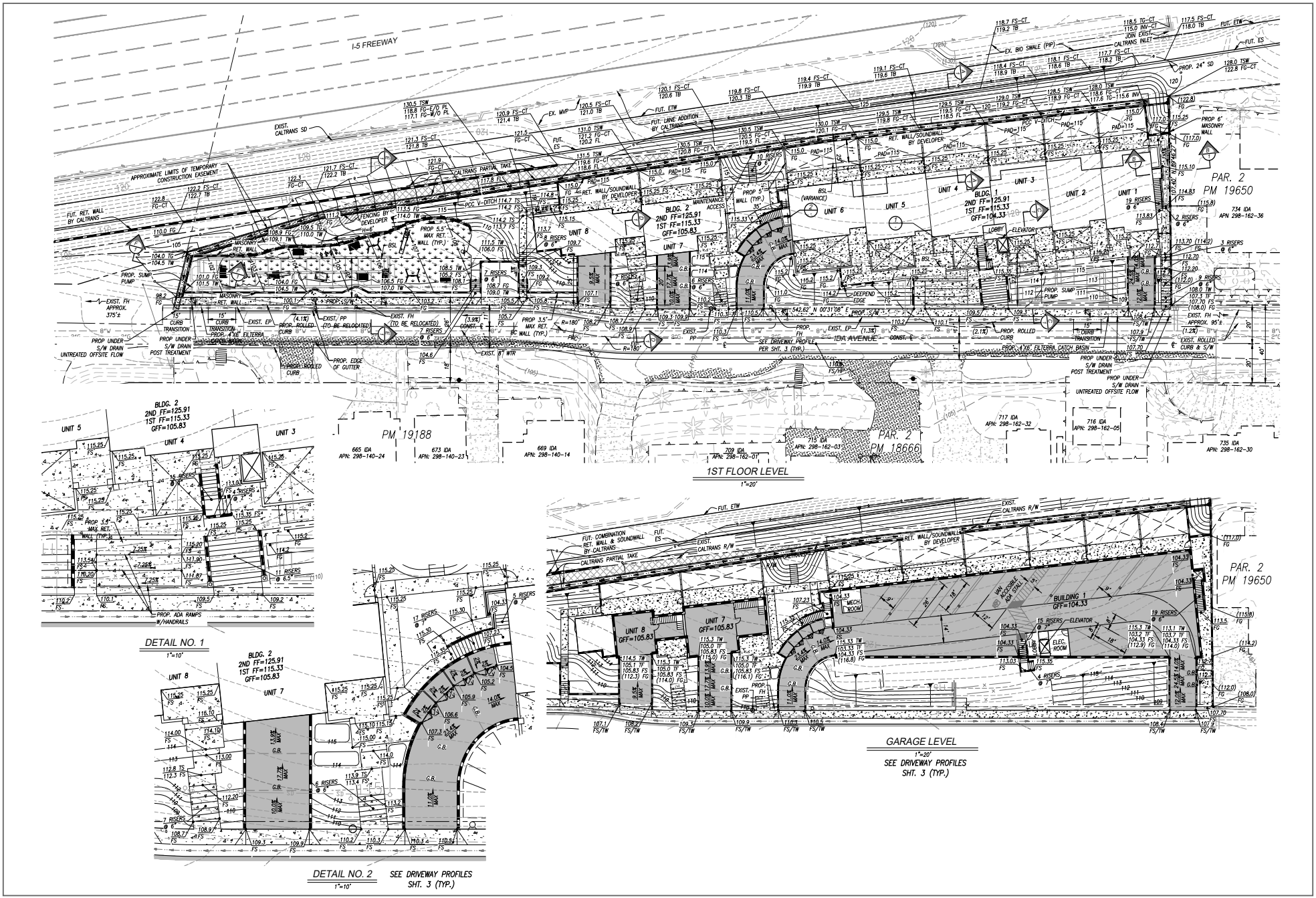
0 1,000 2,000 Feet

FIGURE 1

Project Location

Ida Avenue Apartments Project

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SOURCE: Chereskin Architecture 2018

FIGURE 2

Site Plan

Noise Technical Report for the Ida Avenue Project

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2 Air Quality

2.1 Environmental Setting

The project area is located within the San Diego Air Basin (SDAB) and is subject to SDAPCD guidelines and regulations. The SDAB is one of 15 air basins that geographically divide California. The SDAB lies in the southwest corner of California, comprises the entire San Diego region, and covers approximately 4,260 square miles.

2.1.1 Climate and Meteorology

The primary factors that determine air quality are the locations of air pollutant sources and the amount of pollutants emitted. Meteorological and topographical conditions, however, are also important. Factors such as wind speed and direction, air temperature gradients and sunlight, and precipitation and humidity interact with physical landscape features to determine the movement and dispersal of air pollutants. Meteorological and topographical factors that affect air quality in the SDAB are described below.[2]

Regional Climate and Meteorological Conditions

The climate of the San Diego region, as in most of Southern California, is influenced by the strength and position of the semi-permanent high-pressure system over the Pacific Ocean, known as the Pacific High. This high-pressure ridge over the West Coast often creates a pattern of late-night and early-morning low clouds, hazy afternoon sunshine, daytime onshore breezes, and little temperature variation year-round. The SDAB is characterized as a Mediterranean climate with dry, warm summers and mild, occasionally wet winters. Average temperature ranges (in °F) from the mid-40s to the high 90s, with an average of 201 days warmer than 70°F. The SDAB experiences 9 to 13 inches of rainfall annually, with most of the region's precipitation falling from November through March, with infrequent (approximately 10%) precipitation during the summer. El Niño and La Niña patterns have large effects on the annual rainfall received in San Diego; San Diego receives less than normal rainfall during La Niña years.

The interaction of ocean, land, and the Pacific High maintains clear skies for much of the year and influences the direction of prevailing winds (westerly to northwesterly). The winds tend to blow onshore during the day and offshore at night. Local terrain is often the dominant factor inland, and winds in inland mountainous areas tend to blow through the valleys during the day and down the hills and valleys at night.

The favorable climate of San Diego also works to create air pollution problems. Sinking, or subsiding, air from the Pacific High creates a temperature inversion known as a subsidence inversion, which acts as a "lid" to vertical dispersion of pollutants. Weak summertime pressure gradients further limit horizontal dispersion of pollutants in the mixed layer below the subsidence inversion. Poorly dispersed anthropogenic emissions combined with strong sunshine leads to photochemical reactions that result in the creation of ozone (O_3) at this surface layer. In addition, light winds during the summer further limit ventilation.

[2] The discussion of SDAB meteorological and topographical conditions is based on information provided in the SDAPCD 2016 Monitoring Plan (SDAPCD 2017a), the County of San Diego Guidelines for Determining Significance – Air Quality (County of San Diego 2007), the County of San Diego General Plan Update Environmental Impact Report (County of San Diego 2011), and the CARB Recommended Area Designation for the 2010 Federal Sulfur Dioxide Standard (CARB 2011).

In the fall months, the SDAB is often impacted by Santa Ana winds, which are the result of a high-pressure system over the Nevada and Utah regions that overcomes the westerly wind pattern and forces hot, dry winds from the east to the Pacific Ocean. The Santa Ana winds are powerful and can blow the SDAB's pollutants out to sea. However, a weak Santa Ana can transport air pollution from the South Coast Air Basin and greatly increase O_3 concentrations in the San Diego area.

Under certain conditions, atmospheric oscillation results in the offshore transport of air from the Los Angeles region to San Diego County. This often produces high O_3 concentrations, as measured at air pollutant monitoring stations within the County. The transport of air pollutants from Los Angeles to San Diego can also occur within the stable layer of the elevated subsidence inversion, where high levels of O_3 are transported.

Site-Specific Meteorological Conditions

The local climate within the project area is characterized as semi-arid with consistently mild, warmer temperatures throughout the year. The average summertime high temperature in the region is approximately 67.6°F, with highs reaching 73.6°F on average during the months of July through September. The average wintertime low temperature is approximately 52.9°F, reaching as low as 44.2°F on average during the months of November through March. Average precipitation in the local area is approximately 10.54 inches per year, with the bulk of precipitation falling between November and March (WRCC 2016).

2.1.2 Pollutants and Effects

2.1.2.1 Criteria Air Pollutants

Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. The federal and state standards have been set, with an adequate margin of safety, at levels above which concentrations could be harmful to human health and welfare. These standards are designed to protect the most sensitive persons from illness or discomfort. Pollutants of concern include O_3, nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM_{10}), particulate matter with an aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$), and lead. These pollutants, as well as toxic air contaminants (TACs), are discussed in the following paragraphs.[3] In California, sulfates, vinyl chloride, hydrogen sulfide, and visibility-reducing particles are also regulated as criteria air pollutants.

Ozone. O_3 is a strong-smelling, pale blue, reactive, toxic chemical gas consisting of three oxygen atoms. It is a secondary pollutant formed in the atmosphere by a photochemical process involving the sun's energy and O_3 precursors. These precursors are mainly oxides of nitrogen (NO_x) and volatile organic compounds (VOCs). The maximum effects of precursor emissions on O_3 concentrations usually occur several hours after they are emitted and many miles from the source. Meteorology and terrain play major roles in O_3 formation, and ideal conditions occur during summer and early autumn on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies. O_3 exists in the upper atmosphere O_3 layer (stratospheric O_3) and at the Earth's surface in the troposphere (ground-level O_3).[4] The O_3 that U.S. Environmental Protection Agency (EPA) and the California Air Resources Board

[3] The descriptions of each of the criteria air pollutants and associated health effects are based on the U.S. Environmental Protection Agency's (EPA) Criteria Air Pollutants (EPA 2018a) and the California Air Resources Board (CARB) Glossary of Air Pollutant Terms (CARB 2019a).

[4] The troposphere is the layer of the Earth's atmosphere nearest to the surface of the Earth. The troposphere extends outward about 5 miles at the poles and about 10 miles at the equator.

(CARB) regulate as a criteria air pollutant is produced close to the ground level, where people live, exercise, and breathe. Ground-level O_3 is a harmful air pollutant that causes numerous adverse health effects and is thus considered "bad" O_3. Stratospheric, or "good," O_3 occurs naturally in the upper atmosphere, where it reduces the amount of ultraviolet light (i.e., solar radiation) entering the Earth's atmosphere. Without the protection of the beneficial stratospheric O_3 layer, plant and animal life would be seriously harmed.

O_3 in the troposphere causes numerous adverse health effects; short-term exposures (lasting for a few hours) to O_3 at levels typically observed in Southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes (EPA 2013). These health problems are particularly acute in sensitive receptors such as the sick, the elderly, and young children.

Nitrogen Dioxide. NO_2 is a brownish, highly reactive gas that is present in all urban atmospheres. The major mechanism for the formation of NO_2 in the atmosphere is the oxidation of the primary air pollutant nitric oxide, which is a colorless, odorless gas. NO_x plays a major role, together with VOCs, in the atmospheric reactions that produce O_3. NO_x is formed from fuel combustion under high temperature or pressure. In addition, NO_x is an important precursor to acid rain and may affect both terrestrial and aquatic ecosystems. The two major emissions sources are transportation and stationary fuel combustion sources such as electric utility and industrial boilers.

NO_2 can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections (EPA 2018b).

Carbon Monoxide. CO is a colorless, odorless gas formed by the incomplete combustion of hydrocarbon or fossil fuels. CO is emitted almost exclusively from motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains. In urban areas such as the project location, automobile exhaust accounts for the majority of CO emissions. CO is a nonreactive air pollutant that dissipates relatively quickly; therefore, ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions—primarily wind speed, topography, and atmospheric stability. CO from motor vehicle exhaust can become locally concentrated when surface-based temperature inversions are combined with calm atmospheric conditions, which is a typical situation at dusk in urban areas from November to February. The highest levels of CO typically occur during the colder months of the year, when inversion conditions are more frequent.

In terms of adverse health effects, CO competes with oxygen, often replacing it in the blood, reducing the blood's ability to transport oxygen to vital organs. The results of excess CO exposure can include dizziness, fatigue, and impairment of central nervous system functions.

Sulfur Dioxide. SO_2 is a colorless, pungent gas formed primarily from incomplete combustion of sulfur-containing fossil fuels. The main sources of SO_2 are coal and oil used in power plants and industries; as such, the highest levels of SO_2 are generally found near large industrial complexes. In recent years, SO_2 concentrations have been reduced by the increasingly stringent controls placed on stationary source emissions of SO_2 and limits on the sulfur content of fuels.

SO_2 is an irritant gas that attacks the throat and lungs and can cause acute respiratory symptoms and diminished ventilator function in children. When combined with particulate matter, SO_2 can injure lung tissue and reduce visibility and the level of sunlight. SO_2 can also yellow plant leaves and erode iron and steel.

Particulate Matter. Particulate matter pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter can form when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. $PM_{2.5}$ and PM_{10} represent fractions of particulate matter. Coarse particulate matter (PM_{10}) consists of particulate matter that is 10 microns or less in diameter and is about 1/7 the thickness of a human hair. Major sources of PM_{10} include crushing or grinding operations; dust stirred up by vehicles traveling on roads; wood-burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions. Fine particulate matter ($PM_{2.5}$) consists of particulate matter that is 2.5 microns or less in diameter and is roughly 1/28 the diameter of a human hair. $PM_{2.5}$ results from fuel combustion (e.g., from motor vehicles and power generation and industrial facilities), residential fireplaces, and woodstoves. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases such as sulfur oxides (SO_x), NO_x, and VOCs.

$PM_{2.5}$ and PM_{10} pose a greater health risk than larger-size particles. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. $PM_{2.5}$ and PM_{10} can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. Very small particles of substances such as lead, sulfates, and nitrates can cause lung damage directly or be absorbed into the blood stream, causing damage elsewhere in the body. Additionally, these substances can transport adsorbed gases such as chlorides or ammonium into the lungs, also causing injury. PM_{10} tends to collect in the upper portion of the respiratory system, whereas $PM_{2.5}$ is so tiny that it can penetrate deeper into the lungs and damage lung tissue. Suspended particulates also damage and discolor surfaces on which they settle and produce haze and reduce regional visibility.

People with influenza, people with chronic respiratory and cardiovascular diseases, and the elderly may suffer worsening illness and premature death as a result of breathing particulate matter. People with bronchitis can expect aggravated symptoms from breathing in particulate matter. Children may experience a decline in lung function due to breathing in PM_{10} and $PM_{2.5}$ (EPA 2009).

Lead. Lead in the atmosphere occurs as particulate matter. Sources of lead include leaded gasoline; the manufacturing of batteries, paints, ink, ceramics, and ammunition; and secondary lead smelters. Prior to 1978, mobile emissions were the primary source of atmospheric lead. Between 1978 and 1987, the phaseout of leaded gasoline reduced the overall inventory of airborne lead by nearly 95%. With the phaseout of leaded gasoline, secondary lead smelters, battery recycling, and manufacturing facilities are becoming lead-emissions sources of greater concern.

Prolonged exposure to atmospheric lead poses a serious threat to human health. Health effects associated with exposure to lead include gastrointestinal disturbances, anemia, kidney disease, and, in severe cases, neuromuscular and neurological dysfunction. Of particular concern are low-level lead exposures during infancy and childhood. Such exposures are associated with decrements in neurobehavioral performance, including intelligence quotient performance, psychomotor performance, reaction time, and growth. Children are highly susceptible to the effects of lead.

Sulfates. Sulfates are the fully oxidized form of sulfur, which typically occur in combination with metals or hydrogen ions. Sulfates are produced from reactions of SO_2 in the atmosphere. Sulfates can result in respiratory impairment, as well as reduced visibility.

Vinyl Chloride. Vinyl chloride is a colorless gas with a mild, sweet odor, which has been detected near landfills, sewage plants, and hazardous waste sites, due to the microbial breakdown of chlorinated solvents. Short-term exposure to high levels of vinyl chloride in air can cause nervous system effects, such as dizziness, drowsiness, and headaches. Long-term exposure through inhalation can cause liver damage, including liver cancer.

Hydrogen Sulfide. Hydrogen sulfide is a colorless and flammable gas that has a characteristic odor of rotten eggs. Sources of hydrogen sulfide include geothermal power plants, petroleum refineries, sewers, and sewage treatment plants. Exposure to hydrogen sulfide can result in nuisance odors, as well as headaches and breathing difficulties at higher concentrations.

Visibility-Reducing Particles. Visibility-reducing particles are any particles in the air that obstruct the range of visibility. Effects of reduced visibility can include obscuring the viewshed of natural scenery, reducing airport safety, and discouraging tourism. Sources of visibility-reducing particles are the same as for $PM_{2.5}$ described above.

Volatile Organic Compounds. Hydrocarbons are organic gases that are formed from hydrogen and carbon and sometimes other elements. Hydrocarbons that contribute to formation of O_3 are referred to and regulated as VOCs (also referred to as reactive organic gases). Combustion engine exhaust, oil refineries, and fossil-fueled power plants are the sources of hydrocarbons. Other sources of hydrocarbons include evaporation from petroleum fuels, solvents, dry cleaning solutions, and paint.

The primary health effects of VOCs result from the formation of O_3 and its related health effects. High levels of VOCs in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen through displacement. Carcinogenic forms of hydrocarbons, such as benzene, are considered TACs. There are no separate health standards for VOCs as a group.

2.1.2.2 Non-Criteria Air Pollutants

Toxic Air Contaminants. A substance is considered toxic if it has the potential to cause adverse health effects in humans, including increasing the risk of cancer upon exposure, or acute and/or chronic non-cancer health effects. A toxic substance released into the air is considered a TAC. TACs are identified by federal and state agencies based on a review of available scientific evidence. In the State of California, TACs are identified through a two-step process that was established in 1983 under the Toxic Air Contaminant Identification and Control Act. This two-step process of risk identification and risk management and reduction was designed to protect residents from the health effects of toxic substances in the air. In addition, the California Air Toxics "Hot Spots" Information and Assessment Act, Assembly Bill (AB) 2588, was enacted by the legislature in 1987 to address public concern over the release of TACs into the atmosphere. The law requires facilities emitting toxic substances to provide local air pollution control districts with information that will allow an assessment of the air toxics problem, identification of air toxics emissions sources, location of resulting hotspots, notification of the public exposed to significant risk, and development of effective strategies to reduce potential risks to the public over 5 years.

Examples include certain aromatic and chlorinated hydrocarbons, certain metals, and asbestos. TACs are generated by a number of sources, including stationary sources such as dry cleaners, gas stations, combustion sources, and laboratories; mobile sources such as automobiles; and area sources such as landfills. Adverse health effects associated with exposure to TACs may include carcinogenic (i.e., cancer-causing) and noncarcinogenic effects. Noncarcinogenic effects typically affect one or more target organ systems and may be experienced on either short-term (acute) or long-term (chronic) exposure to a given TAC.

Diesel Particulate Matter. Diesel particulate matter (DPM) is part of a complex mixture that makes up diesel exhaust. Diesel exhaust is composed of two phases, gas and particle, both of which contribute to health risks. More than 90% of DPM is less than 1 micrometer in diameter (about 1/70th the diameter of a human hair), and thus is a subset of $PM_{2.5}$ (CARB 2019b). DPM is typically composed of carbon particles ("soot," also called black carbon) and numerous organic compounds, including over 40 known cancer-causing organic substances. Examples of these chemicals include polycyclic aromatic hydrocarbons, benzene, formaldehyde, acetaldehyde, acrolein, and 1,3-butadiene (CARB 2019b). CARB classified "particulate emissions from diesel-fueled engines" (i.e., DPM) (17 CCR 93000) as a TAC in August 1998. DPM is emitted from a broad range of diesel engines: on-road diesel engines of trucks, buses, and cars, and off-road diesel engines, including locomotives, marine vessels, and heavy-duty construction equipment, among others. Approximately 70% of all airborne cancer risk in California is associated with DPM (CARB 2000). To reduce the cancer risk associated with DPM, CARB adopted a diesel risk reduction plan in 2000 (CARB 2000). Because it is part of $PM_{2.5}$, DPM also contributes to the same non-cancer health effects as $PM_{2.5}$ exposure. These effects include premature death; hospitalizations and emergency department visits for exacerbated chronic heart and lung disease, including asthma; increased respiratory symptoms; and decreased lung function in children. Several studies suggest that exposure to DPM may also facilitate development of new allergies (CARB 2019b). Those most vulnerable to non-cancer health effects are children whose lungs are still developing and the elderly who often have chronic health problems.

Odorous Compounds. Odors are generally regarded as an annoyance rather than a health hazard. Manifestations of a person's reaction to odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache). The ability to detect odors varies considerably among the population and overall is subjective. People may have different reactions to the same odor. An odor that is offensive to one person may be perfectly acceptable to another (e.g., coffee roaster). An unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. Known as odor fatigue, a person can become desensitized to almost any odor, and recognition may only occur with an alteration in the intensity. The occurrence and severity of odor impacts depend on the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of receptors.

Valley Fever. Coccidioidomycosis, more commonly known as "valley fever," is an infection caused by inhalation of the spores of the *Coccidioides immitis* fungus, which grows in the soils of the southwestern United States. When fungal spores are present, any activity that disturbs the soil, such as digging, grading, or other earth-moving operations, can cause the spores to become airborne and thereby increase the risk of exposure. The ecologic factors that appear to be most conducive to survival and replication of the spores are high summer temperatures, mild winters, sparse rainfall, and alkaline sandy soils.

The County is not considered a highly endemic region for valley fever as the San Diego County Health and Human Services Agency is listed as having 5.5 cases per 100,000 people. The project site is located within the 92075 zip code; the incidence of Coccidioidomycosis was not reported there due to the number of cases reported being less than the minimum required (Nelson, pers. comm. 2019). For comparison, statewide incidences in 2018 were 18.8 per 100,000 people (CDPH 2019).

Even if present at a site, earth-moving activities may not result in increased incidence of valley fever. Propagation of *Coccidioides immitis* is dependent on climatic conditions, with the potential for growth and surface exposure highest following early seasonal rains and long dry spells. *Coccidioides immitis* spores can be released when filaments are disturbed by earth-moving activities, although receptors must be exposed to and inhale the spores to be at increased risk of developing valley fever. Moreover, exposure to *Coccidioides immitis* does not guarantee that an individual will become ill—approximately 60% of people exposed to the fungal spores are asymptomatic and show no signs of an infection (USGS 2000).

2.1.3 Sensitive Receptors

Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. People most likely to be affected by air pollution include children, the elderly, athletes, and people with cardiovascular and chronic respiratory diseases. Facilities and structures where these air pollution–sensitive people live or spend considerable amounts of time are known as sensitive receptors. Land uses where air pollution–sensitive individuals are most likely to spend time include schools and schoolyards, parks and playgrounds, daycare centers, nursing homes, hospitals, and residential communities (sensitive sites or sensitive land uses) (CARB 2005). The SDAPCD identifies sensitive receptors as those who are especially susceptible to adverse health effects from exposure to toxic air contaminants, such as children, the elderly, and the ill. Sensitive receptors include schools (grades kindergarten through 12), daycare centers, nursing homes, retirement homes, health clinics, and hospitals within 2 kilometers of the project site (SDAPCD 2015).

The closest sensitive receptors (residences) are located adjacent to the south boundary and across Ida Avenue to the west of the project site.

2.2 Regulatory Setting

2.2.1 Federal Regulations

2.2.1.1 Criteria Air Pollutants

The federal Clean Air Act, passed in 1970 and last amended in 1990, forms the basis for the national air pollution control effort. The EPA is responsible for implementing most aspects of the Clean Air Act, including setting National Ambient Air Quality Standards (NAAQS) for major air pollutants; setting hazardous air pollutant (HAP) standards; approving state attainment plans; setting motor vehicle emission standards; issuing stationary source emission standards and permits; and establishing acid rain control measures, stratospheric O_3 protection measures, and enforcement provisions. Under the Clean Air Act, NAAQS are established for the following criteria pollutants: O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead.

The NAAQS describe acceptable air quality conditions designed to protect the health and welfare of the citizens of the nation. The NAAQS (other than for O_3, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and those based on annual averages or arithmetic mean) are not to be exceeded more than once per year. NAAQS for O_3, NO_2, SO_2, PM_{10}, and $PM_{2.5}$ are based on statistical calculations over 1- to 3-year periods, depending on the pollutant. The Clean Air Act requires the EPA to reassess the NAAQS at least every 5 years to determine whether adopted standards are adequate to protect public health based on current scientific evidence. States with areas that exceed the NAAQS must prepare state implementation plans (SIPs) that demonstrate how those areas will attain the NAAQS within mandated time frames.

2.2.1.2 Hazardous Air Pollutants

The 1977 federal Clean Air Act amendments required the EPA to identify National Emission Standards for HAPs to protect public health and welfare. HAPs include certain VOCs, pesticides, herbicides, and radionuclides that present a tangible hazard, based on scientific studies of exposure to humans and other mammals. Under the 1990 federal Clean Air Act Amendments, which expanded the control program for HAPs, 189 substances and chemical families were identified as HAPs.

2.2.2 State Regulations

2.2.2.1 Criteria Air Pollutants

The federal Clean Air Act delegates the regulation of air pollution control and the enforcement of the NAAQS to the states. In California, the task of air quality management and regulation has been legislatively granted to CARB, with subsidiary responsibilities assigned to air quality management districts and air pollution control districts at the regional and county levels. CARB, which became part of the California Environmental Protection Agency in 1991, is responsible for ensuring implementation of the California Clean Air Act of 1988, responding to the federal Clean Air Act, and regulating emissions from motor vehicles and consumer products.

CARB has established California Ambient Air Quality Standards (CAAQS), which are generally more restrictive than the NAAQS. As stated previously, an ambient air quality standard defines the maximum amount of a pollutant averaged over a specified period of time that can be present in outdoor air without harm to the public's health. For each pollutant, concentrations must be below the relevant CAAQS before a basin can attain the corresponding CAAQS. Air quality is considered "in attainment" if pollutant levels are continuously below the CAAQS and violate the standards no more than once each year. The CAAQS for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, PM_{10}, $PM_{2.5}$, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded.

California air districts have based their thresholds of significance for CEQA purposes on the levels that scientific and factual data demonstrate that the air basin can accommodate without affecting the attainment date for the NAAQS or CAAQS. Since an ambient air quality standard is based on maximum pollutant levels in outdoor air that would not harm the public's health, and air district thresholds pertain to attainment of the ambient air quality standard, this means that the thresholds established by air districts are also protective of human health. The NAAQS and CAAQS are presented in Table 1.

Table 1. Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
		Concentration[c]	*Primary*[c,d]	*Secondary*[c,e]
O_3	1 hour	0.09 ppm (180 μg/m³)	—	Same as Primary Standard[f]
	8 hours	0.070 ppm (137 μg/m³)	0.070 ppm (137 μg/m³)[f]	
NO_2[g]	1 hour	0.18 ppm (339 μg/m³)	0.100 ppm (188 μg/m³)	Same as Primary Standard
	Annual Arithmetic Mean	0.030 ppm (57 μg/m³)	0.053 ppm (100 μg/m³)	
CO	1 hour	20 ppm (23 mg/m³)	35 ppm (40 mg/m³)	None
	8 hours	9.0 ppm (10 mg/m³)	9 ppm (10 mg/m³)	
SO_2[h]	1 hour	0.25 ppm (655 μg/m³)	0.075 ppm (196 μg/m³)	—
	3 hours	—	—	0.5 ppm (1,300 μg/m³)
	24 hours	0.04 ppm (105 μg/m³)	0.14 ppm (for certain areas)[g]	—
	Annual	—	0.030 ppm (for certain areas)[g]	—

Table 1. Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
		Concentration[c]	*Primary*[c,d]	*Secondary*[c,e]
PM_{10}[i]	24 hours	50 µg/m³	150 µg/m³	Same as Primary Standard
	Annual Arithmetic Mean	20 µg/m³	—	
$PM_{2.5}$[i]	24 hours	—	35 µg/m³	Same as Primary Standard
	Annual Arithmetic Mean	12 µg/m³	12.0 µg/m³	15.0 µg/m³
Lead[j,k]	30-day Average	1.5 µg/m³	—	—
	Calendar Quarter	—	1.5 µg/m³ (for certain areas)[k]	Same as Primary Standard
	Rolling 3-Month Average	—	0.15 µg/m³	
Hydrogen sulfide	1 hour	0.03 ppm (42 µg/m³)	—	—
Vinyl chloride[j]	24 hours	0.01 ppm (26 µg/m³)	—	—
Sulfates	24- hours	25 µg/m³	—	—
Visibility reducing particles	8 hour (10:00 a.m. to 6:00 p.m. PST)	Insufficient amount to produce an extinction coefficient of 0.23 per kilometer due to the number of particles when the relative humidity is less than 70%	—	—

Source: CARB 2018a.

Notes: O_3 = ozone; ppm = parts per million by volume; µg/m³ = micrograms per cubic meter; mg/m³= milligrams per cubic meter; NO_2 = nitrogen dioxide; CO = carbon monoxide; SO_2 = sulfur dioxide; PM_{10} = particulate matter with an aerodynamic diameter less than or equal to 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter less than or equal to 2.5 microns.

a California standards for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, suspended particulate matter (PM_{10}, $PM_{2.5}$), and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

b National standards (other than O_3, NO_2, SO_2, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once per year. The O_3 standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m³ is equal to or less than 1. For $PM_{2.5}$, the 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

c Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based on a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

d National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

e National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

f On October 1, 2015, the national 8-hour O_3 primary and secondary standards were lowered from 0.075 to 0.070 ppm.

g To attain the national 1-hour standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 parts per billion (ppb). Note that the national 1-hour standard is in units of ppb. California standards are in units of ppm. To directly compare the national 1-hour standard to the California standards, the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

h On June 2, 2010, a new 1-hour SO_2 standard was established, and the existing 24-hour and annual primary standards were revoked. To attain the national 1-hour standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until 1 year after an

area is designated for the 2010 standard, except that in areas designated nonattainment of the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

[i] On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 μg/m³ to 12.0 μg/m³. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 μg/m³, as was the annual secondary standard of 15 μg/m³. The existing 24-hour PM_{10} standards (primary and secondary) of 150 μg/m³ were also retained. The form of the annual primary and secondary standards is the annual mean averaged over 3 years.

[j] CARB has identified lead and vinyl chloride as TACs with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[k] The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 μg/m³ as a quarterly average) remains in effect until 1 year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

2.2.2.2 Toxic Air Contaminants

The state Air Toxics Program was established in 1983 under AB 1807. The California TAC list identifies more than 700 pollutants, of which carcinogenic and noncarcinogenic toxicity criteria have been established for a subset of these pollutants pursuant to the California Health and Safety Code. In accordance with AB 2728, the state list includes the (federal) HAPs. In 1987, the legislature enacted the Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588) to address public concern over the release of TACs into the atmosphere. AB 2588 requires facilities emitting toxic substances to provide local air pollution control districts with information that will allow an assessment of the air toxics problem, identification of air toxics emissions sources, location of resulting hotspots, notification of the public exposed to significant risk, and development of effective strategies to reduce potential risks to the public over 5 years. TAC emissions from individual facilities are quantified and prioritized. High-priority facilities are required to perform a health risk assessment, and if specific thresholds are exceeded, the facility operator is required to communicate the results to the public in the form of notices and public meetings.

In 2000, CARB approved a comprehensive Diesel Risk Reduction Plan to reduce diesel emissions from both new and existing diesel-fueled vehicles and engines (CARB 2000). The regulation is anticipated to result in an 80% decrease in statewide diesel health risk in 2020 compared with the diesel risk in 2000. Additional regulations apply to new trucks and diesel fuel, including the On-Road Heavy Duty Diesel Vehicle (In-Use) Regulation, the On-Road Heavy Duty (New) Vehicle Program, the In-Use Off-Road Diesel Vehicle Regulation, and the New Off-Road Compression-Ignition (Diesel) Engines and Equipment program. These regulations and programs have timetables by which manufacturers must comply and existing operators must upgrade their diesel-powered equipment. There are several Airborne Toxic Control Measures that reduce diesel emissions, including In-Use Off-Road Diesel-Fueled Fleets (13 CCR 2449 et seq.) and In-Use On-Road Diesel-Fueled Vehicles (13 CCR 2025).

California Health and Safety Code Section 41700

Section 41700 of the California Health and Safety Code states that a person shall not discharge from any source whatsoever quantities of air contaminants or other materials that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; that endanger the comfort, repose, health, or safety of any of those persons or the public; or that cause, or have a natural tendency to cause, injury or damage to business or property. This section also applies to sources of objectionable odors.

2.2.3 Local Regulations

2.2.3.1 San Diego Air Pollution Control District

The SDAPCD is the regional agency responsible for the regulation and enforcement of federal regulations. CARB is responsible for the regulation of mobile emissions sources within the state, local air quality management districts and air pollution control districts are responsible for enforcing standards and regulating stationary sources. The project area is located within the SDAB and is subject to the guidelines and regulations of the SDAPCD.

Federal Attainment Plans

In December 2016, the SDAPCD adopted an update to the Eight-Hour Ozone Attainment Plan for San Diego County (2008 O_3 NAAQS). The 2016 Eight-Hour Ozone Attainment Plan for San Diego County indicated that local controls and state programs would allow the region to reach attainment of the federal 8-hour O_3 standard (1997 O_3 NAAQS) by 2018 (SDAPCD 2016b). In this plan, SDAPCD relied on the Regional Air Quality Strategy (RAQS) to demonstrate how the region would comply with the federal O_3 standard. The RAQS details how the region will manage and reduce O_3 precursors (NOx and VOCs) by identifying measures and regulations intended to reduce these pollutants. The control measures identified in the RAQS generally focus on stationary sources; however, the emissions inventories and projections in the RAQS address all potential sources, including those under the authority of CARB and the EPA. Incentive programs for reduction of emissions from heavy-duty diesel vehicles, off-road equipment, and school buses are also established in the RAQS.

As documented in the 2016 8-Hour Ozone Attainment Plan for San Diego County, the County has a likely chance of obtaining attainment due to the transition to low emission cars, stricter new source review rules, and continuing the requirement of general conformity for military growth and the San Diego International Airport. The County will also continue emission control measures including ongoing implementation of existing regulations in ozone precursor reduction to stationary and area-wide sources, subsequent inspections of facilities and sources, and the adoption of laws requiring Best Available Retrofit Control Technology for control of emissions (SDAPCD 2016b).

State Attainment Plans

SDAPCD and SANDAG are responsible for developing and implementing the clean air plan for attainment and maintenance of the ambient air quality standards in the SDAB. The RAQS for the SDAB was initially adopted in 1991 and is updated on a triennial basis, most recently in 2016 (SDAPCD 2016b). The RAQS outlines SDAPCD's plans and control measures designed to attain the state air quality standards for O_3. The RAQS relies on information from CARB and SANDAG, including mobile and area source emissions, as well as information regarding projected growth in the County and the cities in the county, to forecast future emissions and then determine from that the strategies necessary for the reduction of emissions through regulatory controls. CARB mobile source emission projections and SANDAG growth projections are based on population, vehicle trends, and land use plans developed by the County and the cities in the county as part of the development of their general plans (SANDAG 2011, 2017).

In December 2016, SDAPCD adopted the revised RAQS for the County. Since 2007, the San Diego region reduced daily VOC emissions and NO_x emissions by 3.9% and 7.0% respectively; SDAPCD expects to continue reductions through 2035 (SDAPCD 2016b). These reductions were achieved through implementation of six VOC control measures and three NO_x control measures adopted in SDAPCD's 2009 RAQS (SDAPCD 2009a); in addition, SDAPCD

is considering additional measures, including three VOC measures and four control measures to reduce 0.3 daily tons of VOC and 1.2 daily tons of NO_x, provided they are found to be feasible region-wide. In addition, SDAPCD has implemented nine incentive-based programs, has worked with SANDAG to implement regional transportation control measures, and has reaffirmed the state emission offset repeal.

In regards to particulate matter emissions reduction efforts, in December 2005, SDAPCD prepared a report titled Measures to Reduce Particulate Matter in San Diego County to address implementation of Senate Bill (SB) 656 in San Diego County (SB 656 required additional controls to reduce ambient concentrations of PM_{10} and $PM_{2.5}$) (SDAPCD 2005). In the report, SDAPCD evaluated implementation of source-control measures that would reduce particulate matter emissions associated with residential wood combustion; various construction activities including earth-moving, demolition, and grading; bulk material storage and handling; carryout and trackout removal and cleanup methods; inactive disturbed land; disturbed open areas; unpaved parking lots/staging areas; unpaved roads; and windblown dust (SDAPCD 2005).

SDAPCD Rules and Regulations

As stated above, SDAPCD is responsible for planning, implementing, and enforcing federal and state ambient standards in the SDAB. The following rules and regulations apply to all sources in the jurisdiction of SDAPCD, and would apply to the project.

SDAPCD Regulation IV: Prohibitions; Rule 50: Visible Emissions. Prohibits discharge into the atmosphere from any single source of emissions whatsoever any air contaminant for a period or periods aggregating more than 3 minutes in any period of 60 consecutive minutes that is darker in shade than that designated as Number 1 on the Ringelmann Chart, as published by the United States Bureau of Mines, or of such opacity as to obscure an observer's view to a degree greater than does smoke of a shade designated as Number 1 on the Ringelmann Chart (SDAPCD 1997).

SDAPCD Regulation IV: Prohibitions; Rule 51: Nuisance. Prohibits the discharge, from any source, of such quantities of air contaminants or other materials that cause or have a tendency to cause injury, detriment, nuisance, annoyance to people and/or the public, or damage to any business or property (SDAPCD 1976).

SDAPCD Regulation IV: Prohibitions; Rule 55: Fugitive Dust. Regulates fugitive dust emissions from any commercial construction or demolition activity capable of generating fugitive dust emissions, including active operations, open storage piles, and inactive disturbed areas, as well as track-out and carry-out onto paved roads beyond a project site (SDAPCD 2009b).

SDAPCD Regulation IV: Prohibitions; Rule 67.0.1: Architectural Coatings. Requires manufacturers, distributors, and end users of architectural and industrial maintenance coatings to reduce VOC emissions from the use of these coatings, primarily by placing limits on the VOC content of various coating categories (SDAPCD 2015).

SDAPCD Regulation XII: Toxic Air Contaminates; Rule 1200: Toxic Air Contaminants – New Source Review. Requires new or modified stationary source units with the potential to emit TACs above rule threshold levels to either demonstrate that they will not increase the maximum incremental cancer risk above 1 in 1 million at every receptor location, or demonstrate that toxics best available control technology (T-BACT) will be employed if maximum incremental cancer risk is equal to or less than 10 in 1 million, or demonstrate compliance with SDAPCD's protocol for those sources with an increase in maximum incremental cancer risk at any receptor location of greater than 10 in 1 million but less than 100 in 1 million (SDAPCD 2017b).

SDAPCD Regulation XII: Toxic Air Contaminates; Rule 1210: Toxic Air Contaminant Public Health Risks – Public Notification and Risk Reduction. Requires each stationary source that is required to prepare a public risk assessment to provide written public notice of risks at or above the following levels: maximum incremental cancer risks equal to or greater than 10 in 1 million, or cancer burden equal to or greater than 1.0, or total acute non-cancer health hazard index equal to or greater than 1.0, or total chronic non-cancer health hazard index equal to or greater than 1.0 (SDAPCD 2017c).

2.2.3.2 San Diego Association of Governments

SANDAG is the regional planning agency for the County and serves as a forum for regional issues relating to transportation, the economy, community development, and the environment. SANDAG serves as the federally designated metropolitan planning organization (MPO) for the County. With respect to air quality planning and other regional issues, SANDAG has prepared San Diego Forward: The Regional Plan (Regional Plan) for the San Diego region (SANDAG 2015). The Regional Plan combines the big-picture vision for how the San Diego region will grow over the next 35 years with an implementation program to help make that vision a reality. The Regional Plan, including its Sustainable Communities Strategy (SCS), is built on an integrated set of public policies, strategies, and investments to maintain, manage, and improve the transportation system so that it meets the diverse needs of the San Diego region through 2050.

In regard to air quality, the Regional Plan sets the policy context in which SANDAG participates and responds to the air district's air quality plans and builds off plan processes that are designed to meet health-based criteria pollutant standards in several ways (SANDAG 2015). First, it complements air quality plans by providing guidance and incentives for public agencies to consider best practices that support the technology-based control measures in air quality plans. Second, the Regional Plan emphasizes the need for better coordination of land use and transportation planning, which heavily influence the emissions inventory from the transportation sectors of the economy. This also minimizes land use conflicts, such as residential development near freeways, industrial areas, or other sources of air pollution.

On September 23, 2016, SANDAG's Board of Directors adopted the final 2016 Regional Transportation Improvement Program (RTIP). The 2016 RTIP is a multibillion dollar, multiyear program of projects for major transportation projects in the San Diego region. Transportation projects supported through federal, state, and TransNet (the San Diego transportation sales tax program) funds must be included in an approved RTIP. Locally funded projects may also be programmed at the discretion of the agency. The 2016 RTIP covers 5 fiscal years and incrementally implements the Regional Plan (SANDAG 2016). The 2018 RTIP was adopted on September 28, 2018.

In February 2019, the SANDAG Board of Directors approved an action plan that extended development of a new vision for the 2021 Regional Plan to late 2021. While work progresses, SANDAG prepared a 2019 Federal Transportation Plan (2019 Federal RTP) that builds on San Diego Forward: The Regional Plan with updated project costs and revenues and a new regional growth forecast. The 2019 Federal RTP is consistent with the Final EIR for the 2015 Regional Plan (SANDAG 2019).

2.2.3.3 City of Solana Beach

The City of Solana Beach General Plan includes various policies related to improving air quality (both directly and indirectly) (City of Solana Beach 2014). Applicable policies include the following.

Conservation and Open Space Element

Policy 7.a: The City shall require new developments to incorporate energy conservation measures and promote alternative energy systems.

Housing Element

Policy H-6.2: Encourage the use of building placement, design, and construction techniques that minimize energy consumption.

Policy H-6.3: Promote the use of green building practices in new and existing development to minimize energy efficiency and conservation.

Policy H-6.4: Consistent with the California Public Utilities Commission's California Long Term Energy Efficiency Strategy Plan, strive to achieve zero net energy use for new residential development by 2020 and zero net energy use for new commercial development by 2030.

Circulation Element

Policy C-1.1: Allow, encourage, and facilitate transit-oriented development, mixed-use, and infill projects in appropriate locations, especially near the transit station and along key corridors such as Highway 101.

Policy C-1.2: Require new development to provide and enhance connectivity to existing transportation facilities via the provision of key roadway connections, sidewalks (where appropriate or desired in residential neighborhoods), and bicycle facilities.

Policy C-1.3: Require new development and redevelopment to provide good internal circulation facilities that meet the needs of pedestrians, bicyclists, children, seniors, and persons with disabilities.

Policy C-2.3: Require new developments to be served by roads of adequate capacity and design standards to provide reasonable access by cars, trucks, transit, pedestrians, and/or bicycles.

Policy C-3.3: Enhance connectivity by eliminating gaps and barriers in roadway, bikeway, and pedestrian networks.

Policy C-3.4: Implement traffic calming techniques, where appropriate, as a means to improve safety, increase efficiency of pick-up and drop-off operations at schools, and provide greater separation between pedestrians and vehicles.

Policy C-9.6: Require new development and redevelopment to provide safe, secure bicycle parking facilities.

Policy C-10.4: Require new development and redevelopment to provide adequate pedestrian access and, where appropriate, incorporate pedestrian-oriented street designs that provide a pleasant environment for walking.

2.3 Regional and Local Air Quality Conditions

2.3.1 San Diego Air Basin Attainment Designation

Pursuant to the 1990 federal Clean Air Act amendments, the EPA classifies air basins (or portions thereof) as "attainment" or "nonattainment" for each criteria air pollutant, based on whether the NAAQS have been achieved. Generally, if the recorded concentrations of a pollutant are lower than the standard, the area is classified as "attainment"

for that pollutant. If an area exceeds the standard, the area is classified as "nonattainment" for that pollutant. If there is not enough data available to determine whether the standard is exceeded in an area, the area is designated as "unclassified" or "unclassifiable." The designation of "unclassifiable/attainment" means that the area meets the standard or is expected to be meet the standard despite a lack of monitoring data. Areas that achieve the standards after a nonattainment designation are re-designated as maintenance areas and must have approved maintenance plans to ensure continued attainment of the standards. The California Clean Air Act, like its federal counterpart, called for the designation of areas as "attainment" or "nonattainment," but based on CAAQS rather than the NAAQS. Table 2 depicts the current attainment status of the project site with respect to the NAAQS and CAAQS.

Table 2. San Diego Air Basin Attainment Classification

Pollutant	Designation/Classification	
	National Standards	*California Standards*
Ozone (O_3) – 1 hour[a]	Attainment[a]	**Nonattainment**
O_3 (8-hour – 1997) (8-hour – 2008)	Attainment (Maintenance) **Nonattainment (Moderate)**	**Nonattainment**
Nitrogen Dioxide (NO_2)	Unclassifiable/Attainment	Attainment
Carbon Monoxide (CO)	Attainment (Maintenance)	Attainment
Sulfur Dioxide (SO_2)	Unclassifiable/Attainment	Attainment
Coarse Particulate Matter (PM_{10})	Unclassifiable/Attainment	**Nonattainment**
Fine Particulate Matter ($PM_{2.5}$)	Unclassifiable/Attainment	**Nonattainment**
Lead (Pb)	Unclassifiable/Attainment	Attainment
Hydrogen Sulfide	No National standard	Attainment
Sulfates	No National standard	Unclassified
Visibility-Reducing Particles	No National standard	Unclassified
Vinyl Chloride	No National standard	No designation

Sources: EPA 2018b (national); CARB 2018a (California).
Notes:
Attainment = meets the standards; Attainment (Maintenance) = achieve the standards after a nonattainment designation; Nonattainment = does not meet the standards; Unclassified or Unclassifiable = insufficient data to classify; Unclassifiable/Attainment = meets the standard or is expected to be meet the standard despite a lack of monitoring data.

[a] The federal 1-hour standard of 0.12 ppm was in effect from 1979 through June 15, 2005. The revoked standard is referenced here because it was employed for such a long period and because this benchmark is addressed in SIPs.

In summary, the SDAB is designated as an attainment area for the 1997 8-hour O_3 NAAQS and as a nonattainment area for the 2008 8-hour O_3 NAAQS. The SDAB is designated as a nonattainment area for O_3, PM_{10}, and $PM_{2.5}$ CAAQS. The portion of the SDAB where the project is located in is designated as attainment or unclassifiable/unclassified for all other criteria pollutants under the NAAQS and CAAQS.

2.3.2 Air Quality Monitoring Data

CARB, air districts, and other agencies monitor ambient air quality at approximately 250 air quality monitoring stations across the state. Local ambient air quality is monitored by SDAPCD. SDAPCD operates a network of ambient air monitoring stations throughout the County that measure ambient concentrations of pollutants and determine whether the ambient air quality meets the CAAQS and the NAAQS. The nearest SDAPCD-operated monitoring station is the Camp Pendleton monitoring station, which is located approximately 21 miles north of the project site. This site was used to show the background ambient air quality for O_3 and NO_2. The closest monitoring site that measures CO, SO_2, PM_{10}, and $PM_{2.5}$ for years 2016 and 2017 is the First Street – El Cajon

monitoring station located at 533 First Street, El Cajon, and for year 2018 is the Floyd Smith Drive – El Cajon monitoring station located at 10537 Floyd Smith Drive, El Cajon, which are about 23 miles southeast of the site. The most recent background ambient air quality data and number of days exceeding the ambient air quality standards from 2016 to 2018 are presented in Table 3.

Table 3. Local Ambient Air Quality Data

Averaging Time	Unit	Agency/ Method	Ambient Air Quality Standard	Measured Concentration by Year			Exceedances by Year		
				2016	*2017*	*2018*	*2016*	*2017*	*2018*
Ozone (O_3) – Camp Pendleton									
Maximum 1-hour concentration	ppm	State	0.09	0.083	0.094	0.084	0	0	0
Maximum 8-hour concentration	ppm	State	0.070	0.073	0.081	0.068	4	4	0
		Federal	0.070	0.073	0.081	0.068	4	4	0
Nitrogen Dioxide (NO_2) – Camp Pendleton									
Maximum 1-hour concentration	ppm	State	0.18	0.072	0.063	0.045	0	0	0
		Federal	0.100	0.072	0.063	0.045	0	0	0
Annual concentration	ppm	State	0.030	0.006	0.006	0.008	—	—	—
		Federal	0.053	0.006	0.006	0.008	—	—	—
Carbon Monoxide (CO) – El Cajon – First Street; Floyd Smith Drive									
Maximum 1-hour concentration	ppm	State	20	1.6	1.5	1.4	0	0	0
		Federal	35	1.6	1.5	1.4	0	0	0
Maximum 8-hour concentration	ppm	State	9.0	1.3	1.4	1.1	0	0	0
		Federal	9	1.3	1.4	1.1	0	0	0
Sulfur Dioxide (SO_2) – El Cajon – First Street; Floyd Smith Drive									
Maximum 1-hour concentration	ppm	Federal	0.075	0.0006	0.0011	0.0035	0	0	0
Maximum 24-hour concentration	ppm	Federal	0.14	0.0002	0.0004	0.0004	0	0	0
Annual concentration	ppm	Federal	0.030	0.00008	0.00011	0.00010	0	0	0
Coarse Particulate Matter (PM_{10})[a] – El Cajon – First Street; Floyd Smith Drive									
Maximum 24-hour concentration	µg/m³	State	50	50	50	43	0.0 (0)	0.0 (0)	0.0 (0)
		Federal	150	50	50	43	0.0 (0)	0.0 (0)	0.0 (0)
Annual concentration	µg/m³	State	20	—	—	—	—	—	—
Fine Particulate Matter ($PM_{2.5}$)[a] – El Cajon – First Street; Floyd Smith Drive									
Maximum 24-hour concentration	µg/m³	Federal	35	23.9	31.8	36.2	0.0 (0)	0.0 (0)	1.0 (1)
Annual concentration	µg/m³	State	12	7.4	9.6	9.6	0.0 (0)	0.0 (0)	0.0 (0)
		Federal	12.0	7.4	9.6	9.6	0.0 (0)	0.0 (0)	0.0 (0)

Sources: CARB 2019c; EPA 2019a.
Notes: ppm = parts per million; — = not available; μg/m³ = micrograms per cubic meter;
Data taken from CARB iADAM (CARB 2019c) and EPA AirData (EPA 2019a) represent the highest concentrations experienced over a given year. Daily exceedances for particulate matter are estimated days because PM_{10} and $PM_{2.5}$ are not monitored daily. All other criteria pollutants did not exceed federal or state standards during the years shown. There is no federal standard for 1-hour O_3, annual PM_{10}, or 24-hour SO_2, nor is there a state 24-hour standard for $PM_{2.5}$.
Camp Pendleton monitoring station is located at 21441 West B Street, Camp Pendleton, California.
El Cajon – First Street monitoring station is located at 533 First Street, El Cajon, California.
El Cajon – Floyd Smith Drive monitoring station is located at 10537 Floyd Smith Drive, El Cajon, California.
[a] Measurements of PM_{10} and $PM_{2.5}$ are usually collected every 6 days and every 1 to 3 days, respectively. Number of days exceeding the standards is a mathematical estimate of the number of days concentrations would have been greater than the level of the standard had each day been monitored. The numbers in parentheses are the measured number of samples that exceeded the standard.

2.4 Significance Criteria and Methodology

2.4.1 Thresholds of Significance

Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.) provides guidance for evaluating whether a development project may result in significant impacts. Based on Appendix G of the CEQA Guidelines, the project would have a significant impact on air quality it would:

1. Conflict with or obstruct implementation of the applicable air quality plan.
2. 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.
3. Expose sensitive receptors to substantial pollutant concentrations.
4. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.) indicates that, where available, the significance criteria established by the applicable air quality management district or pollution control district may be relied upon to determine whether the project would have a significant impact on air quality.

As part of its air quality permitting process, SDAPCD has established thresholds in Rule 20.2 requiring the preparation of Air Quality Impact Assessments for permitted stationary sources (SDAPCD 2016a). SDAPCD sets forth quantitative emission thresholds below which a stationary source would not have a significant impact on ambient air quality. Although these trigger levels do not generally apply to mobile sources or general land development projects, for comparative purposes these levels may be used to evaluate the increased emissions that would be discharge to the SDAB from proposed land development projects (County of San Diego 2007). Project-related air quality impacts estimated in this environmental analysis would be considered significant if any of the applicable significance thresholds presented in Table 4 are exceeded.

Table 4. SDAPCD Air Quality Significance Thresholds

Construction Emissions	
Pollutant	*Total Emissions (Pounds per Day)*
Respirable Particulate Matter (PM_{10})	100
Fine Particulate Matter ($PM_{2.5}$)	55
Oxides of Nitrogen (NO_x)	250

Table 4. SDAPCD Air Quality Significance Thresholds

Construction Emissions			
Pollutant	*Total Emissions (Pounds per Day)*		
Oxides of Sulfur (SO_x)	250		
Carbon Monoxide (CO)	550		
Volatile Organic Compounds (VOC)	75*		
Operational Emissions			
	Total Emissions		
Pollutant	*Pounds per Hour*	*Pounds per Day*	*Tons per Year*
Respirable Particulate Matter (PM_{10})	—	100	15
Fine Particulate Matter ($PM_{2.5}$)	—	55	10
Oxides of Nitrogen (NO_x)	25	250	40
Sulfur Oxides (SO_x)	25	250	40
Carbon Monoxide (CO)	100	550	100
Lead and Lead Compounds	—	3.2	0.6
Volatile Organic Compounds (VOC)	—	75*	13.7

Sources: SDAPCD Rules 1501 (SDAPCD 1995) and 20.2(d)(2) (SDAPCD 2016a).

* VOC threshold based on the threshold of significance for VOCs from the South Coast Air Quality Management District for the Coachella Valley as stated in the San Diego County Guidelines for Determining Significance.

The thresholds listed in Table 4 represent screening-level thresholds that can be used to evaluate whether proposed-project-related emissions could cause a significant impact on air quality. Emissions below the screening-level thresholds would not cause a significant impact. The emissions-based thresholds for O_3 precursors are intended to serve as a surrogate for an "O_3 significance threshold" (i.e., the potential for adverse O_3 impacts to occur). This approach is used because O_3 is not emitted directly (see the discussion of O_3 and its sources in Section 2.1.2.1, Criteria Air Pollutants), and the effects of an individual project's emissions of O_3 precursors (VOC and NO_x) on O_3 levels in ambient air cannot be determined through air quality models or other quantitative methods. For nonattainment pollutants, if emissions exceed the thresholds shown in Table 4, the project could have the potential to result in a cumulatively considerable net increase in these pollutants and thus could have a significant impact on the ambient air quality.

With respect to odors, SDAPCD Rule 51 (Public Nuisance) prohibits emission of any material that causes nuisance to a considerable number of persons or endangers the comfort, health, or safety of any person. A project that involves a use that would produce objectionable odors would be deemed to have a significant odor impact if it would affect a considerable number of off-site receptors.

2.4.2 Approach and Methodology

2.4.2.1 Construction Emissions

Emissions from the construction phase of the project were estimated using the California Emissions Estimator Model (CalEEMod) Version 2016.3.2 (CAPCOA 2017). Construction scenario assumptions, including phasing, equipment mix, and vehicle trips, were based on information provided by the project applicant and CalEEMod default values when project specifics were not known.

For purposes of estimating project emissions, and based on information provided by the project applicant, it is assumed that construction of the project would occur 5 days per week and commence in July 2021[5] and would last approximately 11 months, ending in May 2022. The analysis contained herein is based on the following assumptions (duration of phases is approximate):

- Site Preparation: 2 days (July 2021– July 2021)
- Grading: 1 week (July 2021– July 2021)
- Building Construction: 2 months (July 2021– April 2022)
- Paving: 2 weeks (April 2022– April 2022)
- Architectural Coating: 2 weeks (April 2022– May 2022)

Construction-worker and vendor trip estimates by construction phase were based on CalEEMod default data. Grading would include 1.44 acres, including 0.94 acres project onsite and 0.19 acres Caltrans ROW offsite, and 8,795 cubic yards of soil export. CalEEMod default trip length values were used for the distances for all construction-related trips. The project would implement **PDF-AQ-1** by using low-VOC paints during construction for interior and exterior of the residential buildings to meet a VOC content of 5 grams per liter (g/L) or less and 50 g/L or less, respectively.

The construction equipment mix and vehicle trips used for estimating the project-generated construction emissions are shown in Table 5.

Table 5. Construction Scenario Assumptions

Construction Phase	One-Way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Site Preparation	8	0	0	Graders	1	8
				Rubber-tired dozers	1	7
				Tractors/loaders/ backhoes	1	8
Grading	8	0	1,100	Graders	1	8
				Rubber-tired dozers	1	8
				Tractors/loaders/dozers	2	8
Building Construction	9	2	0	Cranes	1	6
				Forklifts	1	6
				Generator sets	1	8
				Tractors/loaders/ backhoes	1	6
				Welders	3	8

[5] The analysis assumes a construction start date of July 2021, which represents the earliest date construction would initiate. Assuming the earliest start date for construction represents the worst-case scenario for criteria air pollutant and GHG emissions because equipment and vehicle emission factors for later years would be slightly less due to more stringent standards for in-use off-road equipment and heavy-duty trucks, as well as fleet turnover replacing older equipment and vehicles in later years.

Table 5. Construction Scenario Assumptions

Construction Phase	One-Way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Paving	13	0	0	Pavers	1	6
				Cement and mortar mixers	1	6
				Paving equipment	1	8
				Tractors/loaders/back hoes	1	8
				Rollers	1	7
Architectural Coating	2	0	0	Air compressors	1	6

Notes: See Appendix A for details.

As discussed in Section 1.5, Dust Control Strategies, the project would implement dust control strategies as **PDF-AQ-3**. To reflect implementation of proposed dust control strategies, the following quantifiable dust control strategies were assumed in CalEEMod:

- Water exposed area two times per day (55% reduction in PM_{10} and $PM_{2.5}$).
- Limit vehicle travel on unpaved roads to 15 miles per hour.
- Dirt and debris spilled onto paved surfaces at the project site and on the adjacent roadways shall be swept, vacuumed, and/or washed at the end of each workday (26% reduction in particulate matter).

2.4.2.2 Operational Emissions

Emissions from the operational phase of the project were estimated using CalEEMod Version 2016.3.2 (CAPCOA 2017). Operational year 2023 was assumed consistent with the first full year of operation following completion of project construction.

Area Sources

CalEEMod was used to estimate operational emissions from area sources, including emissions from consumer product use, architectural coatings, and landscape maintenance equipment. Emissions associated with natural gas usage in space heating and water heating are calculated in the building energy use module of CalEEMod, as described in the following text.

Consumer products are chemically formulated products used by household and institutional consumers, including detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; aerosol paints; and automotive specialty products. Other paint products, furniture coatings, or architectural coatings are not considered consumer products (CAPCOA 2017). The CalEEMod default values for consumer products were assumed.

VOC off-gassing emissions result from evaporation of solvents contained in surface coatings such as in paints and primers used during building maintenance. CalEEMod calculates the VOC evaporative emissions from application of surface coatings based on the VOC emission factor, the building square footage, the assumed fraction of surface area, and the reapplication rate. VOC emissions were estimated based on implementation of **PDF-AQ-1**, which provides VOC content limits for various coatings. The project would use low-VOC paints during construction for interior and exterior of the residential buildings to meet a VOC content of 5 g/L or less and 50 g/L or less, respectively. The model default reapplication rate of 10% of area per year is assumed. Consistent with CalEEMod defaults, it is assumed that the surface area for painting equals 2.7 times the floor square footage, with 75% assumed for interior coating and 25% assumed for exterior surface coating (CAPCOA 2017). For parking lot land uses, 250 g/L VOC was assumed, consistent with CalEEMod default VOC rates.

The project would not construct any wood burning stoves or natural gas fireplaces, as implemented by **PDF-AQ-2**.

Landscape maintenance includes fuel combustion emissions from equipment such as lawn mowers, rototillers, shredders/grinders, blowers, trimmers, chainsaws, and hedge trimmers. The emissions associated from landscape equipment use are estimated based on CalEEMod default values for emission factors (grams per square foot of building space per day) and number of summer days (when landscape maintenance would generally be performed) and winter days.

Energy Sources

As represented in CalEEMod, energy sources include emissions associated with building electricity and natural gas usage. Electricity use would contribute indirectly to criteria air pollutant emissions; however, the emissions from electricity use are only quantified for GHGs in CalEEMod, since criteria pollutant emissions occur at the site of the power plant, which is typically off site.

CalEEMod default values for energy consumption were applied for the project analysis. The energy use from residential buildings was calculated based on CalEEMod energy intensity values (natural gas usage per square foot per year) from the Residential Appliance Saturation Survey database.

Mobile Sources

To quantify emissions associated with project operational mobile sources, trip generation rates for the project residential land use were adjusted in CalEEMod to match the overall weekday daily trips (48 trips) based on the Traffic Impact Analysis (LLG 2020). CalEEMod default data, including trip characteristics, tip lengths, variable start information and emissions factors were used for the model inputs.[6] Project-related traffic was assumed to include a mixture of vehicles consistent with CalEEMod default vehicle fleet assumptions. Emission factors for 2023 (the first full year of project operation) were used to estimate emissions associated with full buildout of the project.

2.4.2.3 Carbon Monoxide Hotspots

Mobile source impacts occur on two scales of motion: regional and local. Regionally, proposed-project-related travel would add to regional trip generation and increase the vehicle miles traveled within the local airshed and the SDAB. Locally, project-generated traffic would be added to the City's roadway system near the project area. If such traffic (1) occurs during periods of poor atmospheric ventilation, (2) is composed of a large number of vehicles "cold-started" and operating at pollution-

[6] The default CalEEMod weighted emission rates for gasoline vehicles have not been adjusted for Safer Affordable Fuel-Efficient Vehicles Rule; however, the redistribution of vehicle miles traveled between electric vehicles, gasoline vehicles, and diesel vehicles would cause a very small change in the weighted emission rates.

inefficient speeds, and (3) is operating on roadways already congested with non-proposed-project traffic, there is a potential for the formation of microscale CO hotspots in the area immediately around points of congested traffic.

In addition to the numerous factors that would need to be present for a CO hotspot to occur, the potential for CO hotspots in the SDAB is steadily decreasing because of the continued improvement in vehicular emissions at a rate faster than the rate of vehicle growth and/or congestion and the already very low ambient CO concentrations. Furthermore, CO transport is extremely limited and disperses rapidly with distance from the source. Under certain extreme meteorological conditions, however, CO concentrations near a congested roadway or intersection may reach unhealthy levels, affecting sensitive receptors such as residents, school children, hospital patients, and the elderly. Typically, high CO concentrations are associated with roadways or intersections operating at an unacceptable level of service. Projects contributing to adverse traffic impacts may result in the formation of CO hotspots.

Because the City does not have CO hotspot guidance, the guidance recommended by the County was applied to evaluate the potential for CO hotspots to occur as a result of the project. As indicated in the County of San Diego Guidelines for Determining Significance and Report Format and Content Requirements Air Quality (County of San Diego 2007), a site-specific CO hotspot analysis should be performed if a proposed development would cause road intersections to operate at or below a level of service E with intersection peak-hour trips exceeding 3,000.

2.5 Impact Analysis

Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.) provides guidance for evaluating whether a development project may result in significant impacts. Based on Appendix G of the CEQA Guidelines, the project impacts are discussed below.

2.5.1 Threshold 1

Would the project conflict with or obstruct implementation of the applicable air quality plan?

As mentioned in Section 2.2.3, Local Regulations, SDAPCD and SANDAG are responsible for developing and implementing the clean air plans for attainment and maintenance of the ambient air quality standards in the basin—specifically, the SIP and RAQS.[7] The federal O_3 maintenance plan, which is part of the SIP, was adopted in 2012. The most recent O_3 attainment plan was adopted in 2016. The SIP includes a demonstration that current strategies and tactics will maintain acceptable air quality in the basin based on the NAAQS. The RAQS was initially adopted in 1991 and is updated on a triennial basis (most recently in 2016). The RAQS outlines SDAPCD's plans and control measures designed to attain the state air quality standards for O_3. The SIP and RAQS rely on information from CARB and SANDAG, including mobile and area source emissions as well as information regarding projected growth in the County as a whole and the cities in the County, to project future emissions and determine the strategies necessary for the reduction of emissions through regulatory controls. CARB mobile source emission projections and SANDAG growth projections are based on population, vehicle trends, and land use plans developed by the County and the cities in the County as part of the development of their general plans.

[7] For the purpose of this discussion, the relevant federal air quality plan is the ozone maintenance plan (SDAPCD 2012). The RAQS is the applicable plan for purposes of state air quality planning. Both plans reflect growth projections in the basin.

If a project involves development that is greater than that anticipated in the local plan and SANDAG's growth projections, the project might be in conflict with the SIP and RAQS and may contribute to a potentially significant cumulative impact on air quality.

The project site is zoned Medium-High Residential 8–12 dwelling units per acre in the City's General Plan. The project is proposing to develop eight dwelling units per 0.94 acres[8]; thus, the project would be in conformance with the zoning and land use designated in the City's General Plan. Thus, the project is consistent with the zoning designation and is anticipated in the local plan and SANDAG's growth projections. Furthermore, SANDAG's Regional Plan population, employee population, and housing estimates for the years 2020 and 2035 were compared to the estimated increase in population, employees, and housing generated by the project. The project would not conflict with or obstruct implementation of the applicable air quality plan, and impacts would be **less than significant**.

Mitigation Measures

No mitigation is required.

Level of Significance After Mitigation

Impacts would be less than significant without mitigation.

2.5.2 Threshold 2

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?

Construction Emissions

Construction of the project would result in the temporary addition of pollutants to the local airshed caused by on-site sources (i.e., off-road construction equipment, rock crushing, soil disturbance, and VOC off-gassing) and off-site sources (i.e., on-road haul trucks, vendor trucks, and worker vehicle trips). Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and for dust, the prevailing weather conditions. Therefore, such emission levels can only be approximately estimated with a corresponding uncertainty in precise ambient air quality impacts.

As discussed in Section 2.4.2.1, Construction Emissions, criteria air pollutant emissions associated with temporary construction activity were quantified using CalEEMod. Construction emissions were calculated for the estimated worst-case day over the construction period associated with each phase and reported as the maximum daily emissions estimated during each year of construction (2021 and 2022). The construction start date was based on information provided by the project applicant and is intended to represent a reasonable scenario based on the best information available. Default values provided in CalEEMod were used where detailed project information was not available.

Implementation of the project would generate air pollutant emissions from entrained dust, off-road equipment, vehicle emissions, architectural coatings, and asphalt pavement application. Entrained dust results from the exposure of earth surfaces to wind from the direct disturbance and movement of soil, resulting in PM_{10} and $PM_{2.5}$ emissions. The project

[8] Project grading would total 1.44 acres, which includes 0.94 acres on-site and 0.5 acres off-site.

would implement various dust control strategies (**PDF-AQ-3**) and would be required to comply with SDAPCD Rule 55 to control dust emissions generated during, but not limited to, the grading activities. Proposed construction practices that would be employed to reduce fugitive dust emissions include watering of the active sites and unpaved roads two times per day depending on weather conditions and restricting vehicle speed on unpaved roads to 15 miles per hour. Internal combustion engines used by construction equipment, vendor trucks (i.e., delivery trucks), and worker vehicles would result in emissions of VOCs, NO_x, CO, PM_{10}, and $PM_{2.5}$. The application of architectural coatings, such as exterior application/interior paint and other finishes, and application of asphalt pavement would also produce VOC emissions; however, the contractor is required to use low-VOC paints for interior and exterior to meet the VOC limits specified in **PDF-AQ-1**.

Table 6 presents the estimated maximum daily construction emissions generated during construction of the project. The values shown are the maximum summer or winter daily emissions results from CalEEMod. Details of the emission calculations are provided in Appendix A.

Table 6. Estimated Maximum Daily Construction Criteria Air Pollutant Emissions – Unmitigated

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	pounds per day					
2021	3.42	85.45	24.86	0.23	7.08	3.05
2022	2.40	12.72	13.00	0.02	0.66	0.59
Maximum	3.42	85.45	24.86	0.23	7.08	3.05
SDAPCD Threshold	75	250	550	250	100	55
Threshold Exceeded?	No	No	No	No	No	No

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SDAPCD = San Diego Air Pollution Control District.
See Appendix A for complete results.
The values shown are the maximum summer or winter daily emissions results from CalEEMod. These emissions reflect CalEEMod "mitigated" output, which accounts for compliance with low-VOC paints and implementation of the project's fugitive dust control strategies, including watering of the project site and unpaved roads two times per day, restricting vehicle speed on unpaved roads to 15 miles per hour, and removing dirt and debris spilled onto paved surfaces at the project site and on adjacent roadways.

As shown in Table 6, daily construction emissions would not exceed the SDAPCD significance thresholds for VOC, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$ during construction in all construction years. Construction-generated emissions would be temporary and would not represent a long-term source of criteria air pollutant emissions. Thus, impacts would be **less than significant.**

Operational Emissions

The project involves construction of a residential land use. Operation of the project would generate VOC, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$ emissions from mobile sources, area sources, consumer products, architectural coatings for repainting, landscape maintenance equipment, and energy sources, including combustion of fuels used for space and water heating and cooking appliances. As discussed in Section 2.4.2.2, Operational Emissions, pollutant emissions associated with long-term operations were quantified using CalEEMod. Implementation of **PDF-AQ-2** would require the project to not construct wood burning stoves and natural gas fireplaces. Project-generated mobile source emissions were estimated in CalEEMod based on project-specific trip rates. CalEEMod default values were used to estimate emissions from the project area and energy sources. Implementation of **PDF-AQ-1** would require the applicant to use low-VOC paints for reapplication.

Table 7 presents the maximum daily area, energy, and mobile source emissions associated with operation (year 2023) of the project. Operational year 2023, the first full year of operation, was assumed upon completion of construction. The values shown are the maximum summer or winter daily emissions results from CalEEMod and are compared to the SDAPCD thresholds of significance. Details of the emission calculations are provided in Appendix A.

Table 7. Estimated Maximum Daily Operational Criteria Air Pollutant Emissions – Unmitigated

Emission Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	pounds per day					
Area	0.20	<0.01	0.66	<0.01	<0.01	<0.01
Energy	<0.01	0.02	<0.01	<0.01	<0.01	<0.01
Mobile	0.08	0.30	0.95	<0.01	0.32	0.09
Total	**0.28**	**0.32**	**1.62**	**<0.01**	**0.32**	**0.09**
SDAPCD Threshold	*75*	*250*	*550*	*250*	*100*	*55*
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SDAPCD = San Diego Air Pollution Control District; <0.01 = reported emissions are less than 0.01.
See Appendix A for complete results.
Totals may not sum due to rounding.
Residential units were not equipped with fireplaces or woodstoves. Low-VOC paints were assumed for re-application.
The values shown are the maximum summer or winter daily emissions results from CalEEMod. These emissions reflect operational year 2023.

As shown in Table 7, the combined daily area, energy, and mobile source emissions would not exceed the SDAPCD operational thresholds for VOC, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$. Thus, impacts associated with project-generated operational criteria air pollutant emissions would be **less than significant.**

Air pollution is largely a cumulative impact. The nonattainment status of regional pollutants is a result of past and present development, and SDAPCD develops and implements plans for future attainment of ambient air quality standards. Based on these considerations, project-level thresholds of significance for criteria pollutants are relevant in the determination of whether a project's individual emissions would have a cumulatively significant impact on air quality. As described above, the project would have a less-than-significant impact for short-term construction and long-term operations.

The SDAB is a nonattainment area for O_3 under the NAAQS and CAAQS. The poor air quality in the SDAB is the result of cumulative emissions from motor vehicles, off-road equipment, commercial and industrial facilities, and other emission sources. Projects that emit these pollutants or their precursors (i.e., VOCs and NO_x for O_3) potentially contribute to poor air quality. In analyzing cumulative impacts from a project, the analysis must specifically evaluate the project's contribution to the cumulative increase in pollutants for which the SDAB is designated as nonattainment for the CAAQS and NAAQS. If the project does not exceed thresholds and is determined to have less-than-significant project-specific impacts, it may still contribute to a significant cumulative impact on air quality if the emissions from the project, in combination with the emissions from other proposed or reasonably foreseeable future projects, are in excess of established thresholds. However, a project would only be considered to have a significant cumulative impact if the project's contribution accounts for a significant proportion of the cumulative total emissions (i.e., it represents a "cumulatively considerable contribution" to the cumulative air quality impact).

Additionally, for the basin, the RAQS serves as the long-term regional air quality planning document for the purpose of assessing cumulative operational emissions in the basin to ensure the SDAB continues to make progress toward

NAAQS- and CAAQS-attainment status. As such, cumulative projects located in the San Diego region would have the potential to result in a cumulative impact to air quality if, in combination, they would conflict with or obstruct implementation of the RAQS. Similarly, individual projects that are inconsistent with the regional planning documents upon which the RAQS is based would have the potential to result in cumulative operational impacts if they represent development and population increases beyond regional projections.

The SDAB has been designated as a federal nonattainment area for O_3 and a state nonattainment area for O_3, PM_{10}, and $PM_{2.5}$. The nonattainment status is the result of cumulative emissions from all sources of these air pollutants and their precursors within the SDAB. As discussed previously, the project would not exceed significance thresholds during construction or operation. As such, the project would result in **less-than-significant impacts** to air quality relative to emissions.

Regarding long-term cumulative operational emissions in relation to consistency with local air quality plans, the SIP and RAQS serve as the primary air quality planning documents for the state and SDAB, respectively. The SIP and RAQS rely on SANDAG growth projections based on population, vehicle trends, and land use plans developed by the cities and the County as part of the development of their general plans. Therefore, projects that involve development consistent with the growth anticipated by local plans would be consistent with the SIP and RAQS and would not be considered to result in cumulatively considerable impacts from operational emissions. As stated previously, the project would be consistent with the zoning designation and would not result in significant regional growth that is not accounted for within the RAQS. As a result, the project would not result in a cumulatively considerable contribution to regional O_3 concentrations or other criteria pollutant emissions. Cumulative impacts would be **less than significant** during operation.

Mitigation Measures

No mitigation is required.

Level of Significance After Mitigation

Impacts would be less than significant without mitigation.

2.5.3 Threshold 3

Would the project expose sensitive receptors to substantial pollutant concentrations?

Air quality varies as a direct function of the amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. Air quality problems arise when the rate of pollutant emissions exceeds the rate of dispersion. Reduced visibility, eye irritation, and adverse health impacts upon those persons termed sensitive receptors are the most serious hazards of existing air quality conditions in the area. Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. Sensitive receptors include residences, schools, playgrounds, child-care centers, athletic facilities, long-term health-care facilities, rehabilitation centers, convalescent centers, and retirement homes. The closest sensitive receptors (residences) are located adjacent to the south boundary and across Ida Avenue to the west of the project site.

Health Impacts of Toxic Air Contaminants

"Incremental cancer risk" is the net increased likelihood that a person continuously exposed to concentrations of TACs resulting from a project over a 9-, 30-, and 70-year exposure period would contract cancer based on the use of standard Office of Environmental Health Hazard Assessment risk-assessment methodology (OEHHA 2015). In addition, some TACs have noncarcinogenic effects. TACs that would potentially be emitted during construction activities would be DPM emitted from heavy-duty construction equipment and heavy-duty trucks. The project will not require the extensive use of heavy-duty construction equipment, which is subject to CARB Airborne Toxic Control Measures to reduce DPM emissions. According to the Office of Environmental Health Hazard Assessment, health risk assessments should be based on a 30-year exposure duration based on typical residency period; however, such assessments should be limited to the period/duration of activities associated with the project (OEHHA 2015). Thus, the duration of proposed construction activities (approximately 11 months) would only constitute a small percentage of the total long-term exposure period and would not result in exposure of proximate sensitive receptors to substantial TACs.

After construction is completed, there would be no long-term source of TAC emissions during operation. No residual TAC emissions and corresponding cancer risk are anticipated after construction, and no long-term sources of TAC emissions are anticipated during operation of the project. Implementation of the project would not expose sensitive receptors to substantial TAC concentrations and impacts would be **less than significant**.

Valley Fever

As discussed in Section 2.1.2.2, valley fever is not highly endemic to the County, and within the County the incidents rate in the project area is below the County average as well as the statewide average. The project would be consistent with SDAPCD Rule 55, which limits the amount of fugitive dust generated during construction and would also control the release of the *Coccidioides immitis* fungus from construction activities by watering two times per day and limiting speed on unpaved roads to 15 miles per hour. The closest sensitive receptors (mobile homes) are located adjacent to the west and south boundary of the project site. Based on the low incidence rate of Coccidioidomycosis in the project area and in greater San Diego County, and the project's implementation of dust control strategies, it is not anticipated that earth-moving activities during project construction would result in exposure of nearby sensitive receptors to valley fever. Therefore, the project would have a **less-than-significant impact** with respect to valley fever exposure to sensitive receptors.

Health Impacts of Carbon Monoxide

The Traffic Impact Analysis (LLG 2020) showed that the project would generate less than 1,000 average daily trips or less than 100 peak hour trips; thus, a traffic impact study was not required. Furthermore, the project would generate 48 average daily trips, which would not likely generate significant daily or peak hour traffic, Therefore, the project operation would not exceed the screening threshold and would not result in a CO hotspot and would not have the potential to result in CO emissions that when totalled with the ambient concentrations would exceed a 1-hour concentration of 20 parts per million or an 8-hour average of 9 parts per million. The impact would be **less than significant.**

Health Effects of Other Criteria Air Pollutants

Project construction and operation would not exceed SDAPCD thresholds for VOC, NO_x, CO, SO_x, $PM_{10,}$ or $PM_{2.5}$.

Table 8 presents a list of the criteria pollutants and other related pollutants of concern, emission sources, associated health effects, and current SDAB attainment status.

Table 8. Pollutants, Sources, Health Effects, and Attainment Status

Pollutant	Sources	Health Effects	Attainment Status	
			NAAQS	*CAAQS*
O_3	Formed when VOCs and NO_x react in the presence of sunlight. VOC sources include any source that burns fuels (e.g., gasoline, natural gas, wood, oil); solvents; petroleum processing and storage.	Breathing difficulties, lung tissue damage, vegetation damage, damage to rubber and some plastics.	Nonattainment	Nonattainment
PM_{10}	Road dust, windblown dust, agriculture and construction, fireplaces. Also formed from other pollutants (NO_x, SO_x, organics). Incomplete combustion.	Increased respiratory disease, lung damage, cancer, premature death, reduced visibility, surface soiling.	Unclassifiable/ Attainment	Nonattainment
$PM_{2.5}$	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning. Also formed from reaction of other pollutants (NO_x, SO_x, organics, and NH_3).	Increases respiratory disease, lung damage, cancer, and premature death, reduced visibility, surface soiling. Particles can aggravate heart diseases such as congestive heart failure and coronary artery disease.	Unclassifiable/ Attainment	Nonattainment
CO	Any source that burns fuel such as automobiles, trucks, heavy construction and farming equipment, residential heating.	Chest pain in heart patients, headaches, reduced mental alertness.	Attainment	Attainment
NO_2	See carbon monoxide.	Lung irritation and damage. Reacts in the atmosphere to form ozone and acid rain.	Unclassifiable/ Attainment	Attainment
Lead	Metal smelters, resource recovery, leaded gasoline, deterioration of lead paint.	Learning disabilities, brain and kidney damage.	Unclassifiable/ Attainment	Attainment
SO_2	Coal or oil burning power plants and industries, refineries, diesel engines.	Increases lung disease and breathing problems for asthmatics. Reacts in the atmosphere to form acid rain.	Unclassifiable/ Attainment	Attainment
Sulfates	Produced by reaction in the air of SO_2, (see SO_2 sources), a component of acid rain.	Breathing difficulties aggravates asthma, reduced visibility.	(no federal standard)	Attainment
Hydrogen Sulfide	Geothermal power plants, petroleum production and refining, sewer gas.	Nuisance odor (rotten egg smell), headache and breathing difficulties (higher concentrations).	(no federal standard)	Unclassified

Table 8. Pollutants, Sources, Health Effects, and Attainment Status

Pollutant	Sources	Health Effects	Attainment Status	
			NAAQS	*CAAQS*
Visibly Reducing Particles	See $PM_{2.5}$	Reduced visibility (e.g., obscures mountains and other scenery), reduced airport safety.	(no federal standard)	Unclassified
Vinyl Chloride	Exhaust gases from factories that manufacture or process vinyl chloride (construction, packaging, and transportation industries)	Central nervous system effects (e.g., dizziness, drowsiness, headaches), kidney irritation, liver damage, liver cancer.	N/A	N/A

Sources: County of San Diego 2007 (pollutant descriptions); EPA 2018b (federal); CARB 2019a (state).
Notes: O_3 = ozone; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; CO = carbon monoxide; NO_2 = nitrogen dioxide; SO_2 = sulfur dioxide.

VOCs and NO_x are precursors to O_3, for which the SDAB is designated as nonattainment with respect to the NAAQS and CAAQS. The health effects associated with O_3 are generally associated with reduced lung function. The contribution of VOCs and NO_x to regional ambient O_3 concentrations is the result of complex photochemistry. The increases in O_3 concentrations in the SDAB due to O_3 precursor emissions tend to be found downwind from the source location to allow time for the photochemical reactions to occur. However, the potential for exacerbating excessive O_3 concentrations would also depend on the time of year that the VOC emissions would occur because exceedances of the O_3 CAAQS/NAAQS tend to occur between April and October when solar radiation is highest. Due to the lack of quantitative methods to assess this complex photochemistry, the holistic effect of a single project's emissions of O_3 precursors is speculative. Construction and operation of the project would not exceed SDAPCD thresholds for VOC and NO_x; thus, implementation of the project would not contribute significant health effects associated with O_3. SDAPCD Rule 67.0.1 restricts the VOC content of coatings for both construction and operational applications. Furthermore, the project would utilize low-VOC paints.

Health effects associated with NO_x include lung irritation and enhanced allergic responses (CARB 2019a). Construction of the project would not contribute to exceedances of the NAAQS and CAAQS for NO_2. Health effects that result from NO_2 and NO_x include respiratory irritation, which could be experienced by nearby receptors during the periods of heaviest use of off-road construction equipment. Project construction would be relatively short-term, and off-road construction equipment would be operating at various portions of the site and would not be concentrated in one portion of the site at any one time. In addition, existing NO_2 concentrations in the area are well below the NAAQS and CAAQS standards. Operation of the project would not require use of any stationary sources (e.g., diesel generators and boilers) that would create substantial, localized NO_x impacts.

Health effects associated with CO include chest pain in patients with heart disease, headache, light-headedness, and reduced mental alertness (CARB 2019a). CO tends to be a localized impact associated with congested intersections. The associated potential for CO hotspots was discussed previously and is determined to be a less-than-significant impact. Thus, the project's CO emissions would not contribute to significant health effects associated with this pollutant.

Health effects associated with PM_{10} include premature death and hospitalization, primarily for worsening of respiratory disease (CARB 2019a). Construction and operation of the project would also not exceed thresholds for PM_{10} or $PM_{2.5}$ and would not contribute to exceedances of the NAAQS and CAAQS for particulate matter or obstruct the SDAB from coming into attainment for these pollutants. The project would also not result in substantial DPM emissions during construction and operation, and therefore would not result in significant health effects related to DPM exposure.

Additionally, the project would implement dust control strategies and be required to comply with SDAPCD Rule 55, which limits the amount of fugitive dust generated during construction. Due to the minimal contribution of particulate matter during construction and operation, the project is not anticipated to result in health effects associated with PM_{10} or $PM_{2.5}$.

In summary, because construction of the project would not result in exceedances of the SDAPCD significance thresholds, the potential health effects associated with criteria air pollutants would be **less than significant.**

Mitigation Measures

No mitigation is required.

Level of Significance After Mitigation

Impacts would be less than significant without mitigation.

2.5.4 Threshold 4

Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

The State of California Health and Safety Code, Division 26, Part 4, Chapter 3, Section 41700 SDAPCD Rule 51 prohibits emissions from any source whatsoever in such quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to the public health or damage to property. Projects required to obtain permits from SDAPCD are evaluated by SDAPCD staff for potential odor nuisance, and conditions may be applied (or control equipment required) where necessary to prevent occurrence of public nuisance.

SDAPCD Rule 51 (Public Nuisance) also prohibits emission of any material that causes nuisance to a considerable number of persons or endangers the comfort, health, or safety of any person. A project that involves a use that would produce objectionable odors would be deemed to have a significant odor impact if it would affect a considerable number of off-site receptors. Odor issues are very subjective by the nature of odors themselves and due to the fact that their measurements are difficult to quantify. As a result, this guideline is qualitative and will focus on the existing and potential surrounding uses and location of sensitive receptors.

The occurrence and severity of potential odor impacts depends on numerous factors. The nature, frequency, and intensity of the source; the wind speeds and direction; and the sensitivity of receiving location each contribute to the intensity of the impact. Although offensive odors seldom cause physical harm, they can be annoying and cause distress among the public and generate citizen complaints.

Odors would be potentially generated from vehicles and equipment exhaust emissions during construction of the project. Potential odors produced during construction would be attributable to concentrations of unburned hydrocarbons from tailpipes of construction equipment, architectural coatings, and asphalt pavement application. Such odors would disperse rapidly from the project site and generally occur at magnitudes that would not affect substantial numbers of people. Therefore, impacts associated with other emissions (such as those leading to odors) during construction would be less than significant.

Land uses and industrial operations that are associated with odor complaints include agricultural uses, wastewater treatment plants, food-processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding facilities. The project entails residential buildings and would not result in the creation of a land use that is commonly associated with odors. Therefore, project operations would not result in odor emissions, and the project impact would be **less than significant.**

Mitigation Measures

No mitigation is required.

Level of Significance After Mitigation

Impacts would be less than significant without mitigation.

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3 Greenhouse Gas Emissions

3.1 Environmental Setting

3.1.1 Climate Change Overview

Climate change refers to any significant change in measures of climate, such as temperature, precipitation, or wind patterns, lasting for an extended period of time (i.e., decades or longer). The Earth's temperature depends on the balance between energy entering and leaving the planet's system. Many factors, both natural and human, can cause changes in Earth's energy balance, including variations in the sun's energy reaching Earth, changes in the reflectivity of Earth's atmosphere and surface, and changes in the greenhouse effect, which affects the amount of heat retained by Earth's atmosphere (EPA 2017a).

The greenhouse effect is the trapping and build-up of heat in the atmosphere (troposphere) near the Earth's surface. The greenhouse effect traps heat in the troposphere through a threefold process as follows: Short-wave radiation emitted by the Sun is absorbed by the Earth, the Earth emits a portion of this energy in the form of long-wave radiation, and GHGs in the upper atmosphere absorb this long-wave radiation and emit it into space and toward the Earth. The greenhouse effect is a natural process that contributes to regulating the Earth's temperature and creates a pleasant, livable environment on the Earth. Human activities that emit additional GHGs to the atmosphere increase the amount of infrared radiation that gets absorbed before escaping into space, thus enhancing the greenhouse effect and causing the Earth's surface temperature to rise.

The scientific record of the Earth's climate shows that the climate system varies naturally over a wide range of time scales and that, in general, climate changes prior to the Industrial Revolution in the 1700s can be explained by natural causes such as changes in solar energy, volcanic eruptions, and natural changes in GHG concentrations. Recent climate changes, in particular the warming observed over the past century, however, cannot be explained by natural causes alone. Rather, it is extremely likely that human activities have been the dominant cause of that warming since the mid-twentieth century and are the most significant driver of observed climate change (IPCC 2013; EPA 2017a). Human influence on the climate system is evident from the increasing GHG concentrations in the atmosphere, positive radiative forcing, observed warming, and improved understanding of the climate system (IPCC 2013). The atmospheric concentrations of GHGs have increased to levels unprecedented in the last 800,000 years, primarily from fossil fuel emissions and secondarily from emissions associated with land use changes (IPCC 2013). Continued emissions of GHGs will cause further warming and changes in all components of the climate system, which is discussed further in Section 3.3.2, Potential Effects of Climate Change.

3.1.2 Greenhouse Gases

A GHG is any gas that absorbs infrared radiation in the atmosphere; in other words, GHGs trap heat in the atmosphere. As defined in California Health and Safety Code, Section 38505(g), for purposes of administering many of the state's primary GHG emissions reduction programs, GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride.

(See also 14 CCR 15364.5.)[9] Some GHGs, such as CO_2, CH_4, and N_2O, occur naturally and are emitted into the atmosphere through natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Manufactured GHGs, which have a much greater heat-absorption potential than CO_2, include fluorinated gases, such as HFCs, PFCs, and SF_6, which are associated with certain industrial products and processes. The following paragraphs provide a summary of the most common GHGs and their sources.[10]

Carbon Dioxide. CO_2 is a naturally occurring gas and a by-product of human activities and is the principal anthropogenic GHG that affects the Earth's radiative balance. Natural sources of CO_2 include respiration of bacteria, plants, animals, and fungus; evaporation from oceans; volcanic out-gassing; and decomposition of dead organic matter. Human activities that generate CO_2 are the combustion of fuels such as coal, oil, natural gas, and wood and changes in land use.

Methane. CH_4 is produced through both natural and human activities. CH_4 is a flammable gas and is the main component of natural gas. CH_4 is produced through anaerobic (without oxygen) decomposition of waste in landfills, flooded rice fields, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.

Nitrous Oxide. N_2O is produced through natural and human activities, mainly through agricultural activities and natural biological processes, although fuel burning and other processes also create N_2O. Sources of N_2O include soil cultivation practices (microbial processes in soil and water), especially the use of commercial and organic fertilizers, manure management, industrial processes (such as in nitric acid production, nylon production, and fossil-fuel-fired power plants), vehicle emissions, and using N_2O as a propellant (e.g., rockets, racecars, and aerosol sprays).

Fluorinated Gases. Fluorinated gases (also referred to as F-gases) are powerful synthetic GHGs emitted from many industrial processes. Fluorinated gases are commonly used as substitutes for stratospheric ozone-depleting substances (e.g., chlorofluorocarbons [CFCs], hydrochlorofluorocarbons [HCFCs], and halons). The most prevalent fluorinated gases include the following:

- **Hydrofluorocarbons:** HFCs are compounds containing only hydrogen, fluorine, and carbon atoms. HFCs are synthetic chemicals used as alternatives to ozone-depleting substances in serving many industrial, commercial, and personal needs. HFCs are emitted as by-products of industrial processes and are used in manufacturing.
- **Perfluorocarbons:** PFCs are a group of human-made chemicals composed of carbon and fluorine only. These chemicals were introduced as alternatives, with HFCs, to the ozone-depleting substances. The two main sources of PFCs are primary aluminum production and semiconductor manufacturing. Since PFCs have stable molecular structures and do not break down through the chemical processes in the lower atmosphere, these chemicals have long lifetimes, ranging between 10,000 and 50,000 years.
- **Sulfur Hexafluoride:** SF_6 is a colorless gas soluble in alcohol and ether and slightly soluble in water. SF_6 is used for insulation in electric power transmission and distribution equipment, semiconductor manufacturing, the magnesium industry, and as a tracer gas for leak detection.

[9] Climate-forcing substances include GHGs and other substances such as black carbon and aerosols. This discussion focuses on the seven GHGs identified in California Health and Safety Code Section 38505, as impacts associated with other climate-forcing substances are not evaluated herein.

[10] The descriptions of GHGs are summarized from the Intergovernmental Panel on Climate Change Second Assessment Report (IPCC 1995), Intergovernmental Panel on Climate Change Fourth Assessment Report (2007), CARB's Glossary of Terms Used in GHG Inventories (2018b), and EPA's Glossary of Climate Change Terms (2016d).

- **Nitrogen Trifluoride:** Nitrogen trifluoride is used in the manufacture of a variety of electronics, including semiconductors and flat panel displays.
- **Chlorofluorocarbons.** CFCs are synthetic chemicals that have been used as cleaning solvents, refrigerants, and aerosol propellants. CFCs are chemically unreactive in the lower atmosphere (troposphere), and the production of CFCs was prohibited in 1987 due to the chemical destruction of stratospheric O_3.
- **Hydrochlorofluorocarbons**. HCFCs are a large group of compounds, whose structure is very close to that of CFCs—containing hydrogen, fluorine, chlorine, and carbon atoms. Like HFCs, HCFCs are used in refrigerants and propellants. HCFCs were also used in place of CFCs for some applications; however, their use in general is being phased out.

Black Carbon. Black carbon is a component of fine particulate matter ($PM_{2.5}$) that has been identified as a leading environmental risk factor for premature death. It is produced from the incomplete combustion of fossil fuels and biomass burning, particularly from older diesel engines and forest fires. Black carbon warms the atmosphere by absorbing solar radiation, influences cloud formation, and darkens the surface of snow and ice, which accelerates heat absorption and melting. Black carbon is a short-lived substance that varies spatially, which makes it difficult to quantify the global warming potential (GWP). DPM emissions are a major source of black carbon and are TACs that have been regulated and controlled in California for several decades to protect public health. In relation to declining DPM from CARB's regulations pertaining to diesel engines, diesel fuels, and burning activities, CARB estimates that annual black carbon emissions in California have reduced by 70% between 1990 and 2010, with 95% control expected by 2020 (CARB 2014).

Water Vapor. The primary source of water vapor is evaporation from the ocean, with additional vapor generated by sublimation (change from solid to gas) from ice and snow, evaporation from other water bodies, and transpiration from plant leaves. Water vapor is the most important, abundant, and variable GHG in the atmosphere and maintains a climate necessary for life.

Ozone. Tropospheric O_3, which is created by photochemical reactions involving gases from both natural sources and human activities, acts as a GHG. Stratospheric O_3, which is created by the interaction between solar ultraviolet radiation and molecular oxygen (O_2), plays a decisive role in the stratospheric radiative balance. Depletion of stratospheric O_3, due to chemical reactions that may be enhanced by climate change, results in an increased ground-level flux of ultraviolet-B radiation.

Aerosols. Aerosols are suspensions of particulate matter in a gas emitted into the air through burning biomass (plant material) and fossil fuels. Aerosols can warm the atmosphere by absorbing and emitting heat and can cool the atmosphere by reflecting light.

3.1.3 Global Warming Potential

Gases in the atmosphere can contribute to climate change both directly and indirectly. Direct effects occur when a gas itself absorbs radiation. Indirect radiative forcing occurs when chemical transformations of a substance produce other GHGs, when a gas influences the atmospheric lifetimes of other gases, and/or when a gas affects atmospheric processes that alter the radiative balance of the Earth (e.g., affect cloud formation or albedo) (EPA 2016d). The Intergovernmental Panel on Climate Change developed the GWP concept to compare the ability of each GHG to trap heat in the atmosphere relative to another gas. The GWP of a GHG is defined as the ratio of the time-integrated radiative forcing from the instantaneous release of 1 kilogram of a trace substance relative to that of 1 kilogram of a reference gas (IPCC 2014a). The reference gas used is CO_2; therefore, GWP-weighted emissions are measured in MT CO_2e.

The current version of CalEEMod (version 2016.3.2) assumes that the GWP for CH_4 is 25 (so emissions of 1 MT of CH_4 are equivalent to emissions of 25 MT of CO_2), and the GWP for N_2O is 298, based on the Intergovernmental Panel on Climate Change Fourth Assessment Report (IPCC 2007). The GWP values identified in CalEEMod were applied to the project.

3.2 Regulatory Setting

3.2.1 Federal Regulations

Massachusetts v. EPA. In *Massachusetts v. EPA* (April 2007), the U.S. Supreme Court directed the EPA administrator to determine whether GHG emissions from new motor vehicles cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. In December 2009, the administrator signed a final rule with the following two distinct findings regarding GHGs under Section 202(a) of the federal Clean Air Act:

- The administrator found that elevated concentrations of GHGs—CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6—in the atmosphere threaten the public health and welfare of current and future generations. This is the "endangerment finding."
- The administrator further found the combined emissions of GHGs—CO_2, CH_4, N_2O, and HFCs—from new motor vehicles and new motor vehicle engines contribute to the GHG air pollution that endangers public health and welfare. This is the "cause or contribute finding."

These two findings were necessary to establish the foundation for regulation of GHGs from new motor vehicles as air pollutants under the Clean Air Act.

Energy Independence and Security Act of 2007. The Energy Independence and Security Act of 2007 (December 2007), among other key measures, would do the following, which would aid in the reduction of national GHG emissions (EPA 2007):

- Increase the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard requiring fuel producers to use at least 36 billion gallons of biofuel in 2022.
- Set a target of 35 miles per gallon for the combined fleet of cars and light trucks by model year 2020, and directs National Highway Traffic Safety Administration (NHTSA) to establish a fuel economy program for medium- and heavy-duty trucks and create a separate fuel economy standard for work trucks.
- Prescribe or revise standards affecting regional efficiency for heating and cooling products and procedures for new or amended standards, energy conservation, energy-efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances.

Federal Vehicle Standards. In response to the U.S. Supreme Court ruling previously discussed, the Bush administration issued Executive Order (EO) 13432 in 2007 directing the EPA, the Department of Transportation, and the Department of Energy to establish regulations that reduce GHG emissions from motor vehicles, non-road vehicles, and non-road engines by 2008. In 2009, the NHTSA issued a final rule regulating fuel efficiency and GHG emissions from cars and light-duty trucks for model year 2011, and in 2010, the EPA and NHTSA issued a final rule regulating cars and light-duty trucks for model years 2012–2016 (75 FR 25324–25728).

In 2010, President Barack Obama issued a memorandum directing the Department of Transportation, Department of Energy, EPA, and NHTSA to establish additional standards regarding fuel efficiency and GHG reduction, clean fuels, and advanced vehicle infrastructure. In response to this directive, EPA and NHTSA proposed stringent, coordinated federal GHG and fuel economy standards for model years 2017–2025 light-duty vehicles. The proposed standards projected to achieve 163 grams per mile of CO_2 in model year 2025, on an average industry fleet-wide basis, which is equivalent to 54.5 miles per gallon if this level were achieved solely through fuel efficiency. The final rule was adopted in 2012 for model years 2017–2021 (77 FR 62624–63200). On January 12, 2017, the EPA finalized its decision to maintain the current GHG emissions standards for model years 2022–2025 cars and light trucks (EPA 2017b).

In addition to the regulations applicable to cars and light-duty trucks described above, in 2011, the EPA and NHTSA announced fuel economy and GHG standards for medium- and heavy-duty trucks for model years 2014–2018 (76 FR 57106–57513). The standards for CO_2 emissions and fuel consumption are tailored to three main vehicle categories: combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles. According to the EPA, this regulatory program will reduce GHG emissions and fuel consumption for the affected vehicles by 6%–23% over the 2010 baselines.

On September 27, 2019, EPA and NHTSA published the Safer Affordable Fuel-Efficient Vehicles Rule Part One: One National Program (84 FR 51310), which became effective November 26, 2019. The Part One Rule revokes California's authority to set its own GHG emissions standards and set zero-emission vehicle mandates in California. The Part One Rule impacts some of the underlying assumptions in the CARB EMFAC 2014 and EMFAC 2017 models for criteria air pollutant emissions from gasoline light-duty vehicles, which CARB released off-model adjustment factors for on November 20, 2019, primarily for use in federal Clean Air Act conformity demonstration analyses. California expects Part Two of these regulations to be adopted later in the fall of 2019. Because CARB does not know the full impacts of these rules until Part Two is released, no off-model adjustments factors are available for GHG emissions at this time. In addition, the EMFAC off-model adjustments have not yet been incorporated into CalEEMod. This issue is evolving as California and 22 other states, as well as the District of Columbia and two cities, filed suit against the EPA over the vehicle waiver revocation on November 15, 2019, and a petition for reconsideration of the rule was filed on November 26, 2019, by California and 22 other states, the District of Columbia, and four cities.

Clean Power Plan and New Source Performance Standards for Electric Generating Units. On October 23, 2015, EPA published a final rule (effective December 22, 2015) establishing the Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units (80 FR 64510–64660), also known as the Clean Power Plan. These guidelines prescribe how states must develop plans to reduce GHG emissions from existing fossil-fuel-fired electric generating units. The guidelines establish CO_2 emission performance rates representing the best system of emission reduction for two subcategories of existing fossil-fuel-fired electric generating units: (1) fossil-fuel-fired electric utility steam-generating units, and (2) stationary combustion turbines. Concurrently, the EPA published a final rule (effective October 23, 2015) establishing Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units (80 FR 64661–65120). The rule prescribes CO_2 emission standards for newly constructed, modified, and reconstructed affected fossil-fuel-fired electric utility generating units. In 2016, the U.S. Supreme Court stayed implementation of the Clean Power Plan pending resolution of several lawsuits.

3.2.2 State Regulations

The statewide GHG emissions regulatory framework is summarized below by category: state climate change targets, building energy, renewable energy and energy procurement, mobile sources, solid waste, water, and other state regulations and goals. The following text describes EOs, legislation, regulations, and other plans and policies that would directly or indirectly reduce GHG emissions and/or address climate change issues.

State Climate Change Targets

The state has taken a number of actions to address climate change. These include EOs, legislation, and CARB plans and requirements. These are summarized below.

EO S-3-05. EO S-3-05 (June 2005) established California's GHG emissions reduction targets and laid out responsibilities among the state agencies for implementing the EO and for reporting on progress toward the targets. This EO established the following targets:

- By 2010, reduce GHG emissions to 2000 levels
- By 2020, reduce GHG emissions to 1990 levels
- By 2050, reduce GHG emissions to 80% below 1990 levels

EO S-3-05 also directed the California Environmental Protection Agency to report biannually on progress made toward meeting the GHG targets and the impacts to California due to global warming, including impacts to water supply, public health, agriculture, the coastline, and forestry. The Climate Action Team was formed, which subsequently issued reports from 2006 to 2010 (CAT 2016).

AB 32. In furtherance of the goals established in EO S-3-05, the legislature enacted AB. The bill is referred to as the California Global Warming Solutions Act of 2006. AB 32 provided initial direction on creating a comprehensive multiyear program to limit California's GHG emissions at 1990 levels by 2020 and initiate the transformations required to achieve the state's long-range climate objectives.

SB 32 and AB 197. SB 32 and AB 197 (enacted in 2016) are companion bills. SB 32 codified the 2030 emissions reduction goal of EO B-30-15 by requiring CARB to ensure that statewide GHG emissions are reduced to 40% below 1990 levels by 2030. AB 197 established the Joint Legislative Committee on Climate Change Policies, consisting of at least three members of the senate and three members of the assembly, in order to provide ongoing oversight over implementation of the state's climate policies. AB 197 also added two members of the legislature to CARB as nonvoting members; requires CARB to make available and update (at least annually via its website) emissions data for GHGs, criteria air pollutants, and TACs from reporting facilities; and requires CARB to identify specific information for GHG emissions reduction measures when updating the scoping plan.

CARB's 2007 Statewide Limit. In 2007, in accordance with California Health and Safety Code Section 38550, CARB approved a statewide limit on the GHG emissions level for year 2020 consistent with the determined 1990 baseline (427 million metric tons [MMT] CO_2e).

CARB's Climate Change Scoping Plan. One specific requirement of AB 32 is for CARB to prepare a scoping plan for achieving the maximum technologically feasible and cost-effective GHG emission reductions by 2020 (California Health and Safety Code Section 38561[a]), and to update the plan at least once every 5 years. In 2008, CARB approved the first scoping plan. The Climate Change Scoping Plan: A Framework for Change (Scoping Plan) included

a mix of recommended strategies that combined direct regulations, market-based approaches, voluntary measures, policies, and other emission reduction programs calculated to meet the 2020 statewide GHG emission limit and initiate the transformations needed to achieve the state's long-range climate objectives. The key elements of the Scoping Plan include the following (CARB 2008):

1. Expanding and strengthening existing energy efficiency programs as well as building and appliance standards.
2. Achieving a statewide renewable energy mix of 33%.
3. Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85% of California's GHG emissions.
4. Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets.
5. Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard (17 CCR 95480 et seq.).
6. Creating targeted fees, including a public goods charge on water use, fees on high GWP gases, and a fee to fund the administrative costs of the State of California's long-term commitment to AB 32 implementation.

The Scoping Plan also identified local governments as essential partners in achieving California's goals to reduce GHG emissions because they have broad influence and, in some cases, exclusive authority over activities that contribute to significant direct and indirect GHG emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations. Specifically, the Scoping Plan encouraged local governments to adopt a reduction goal for municipal operations and for community emissions to reduce GHGs by approximately 15% from then levels (2008) by 2020. Many local governments developed community-scale local GHG reduction plans based on this Scoping Plan recommendation.

In 2014, CARB approved the first update to the Scoping Plan. The First Update to the Climate Change Scoping Plan: Building on the Framework (First Update) defined the state's GHG emission reduction priorities for the next 5 years and laid the groundwork to start the transition to the post-2020 goals set forth in EOs S-3-05 and B-16-2012. The First Update concluded that California is on track to meet the 2020 target, but recommended a 2030 mid-term GHG reduction target be established to ensure a continuum of action to reduce emissions. The First Update recommended a mix of technologies in key economic sectors to reduce emissions through 2050, including energy demand reduction through efficiency and activity changes; large-scale electrification of on-road vehicles, buildings, and industrial machinery; decarbonizing electricity and fuel supplies; and the rapid market penetration of efficient and clean energy technologies. As part of the First Update, CARB recalculated the state's 1990 emissions level, using more recent GWPs identified by the Intergovernmental Panel on Climate Change, from 427 MMT CO_2e to 431 MMT CO_2e.

In 2015, as directed by EO B-30-15, CARB began working on an update to the Scoping Plan to incorporate the 2030 target of 40% below 1990 levels by 2030 to keep California on its trajectory toward meeting or exceeding the long-term goal of reducing GHG emissions to 80% below 1990 levels by 2050 as set forth in S-3-05. The governor called on California to pursue a new and ambitious set of strategies, in line with the five climate change pillars from his inaugural address, to reduce GHG emissions and prepare for the unavoidable impacts of climate change. In the summer of 2016, the legislature affirmed the importance of addressing climate change through passage of SB 32.

In January 2017, CARB released the 2017 Climate Change Scoping Plan Update (2030 Scoping Plan) for public review and comment (CARB 2017). The 2030 Scoping Plan builds on the successful framework established in the initial Scoping Plan and First Update, while identifying new, technologically feasible, and cost-effective strategies that will serve as the framework to achieve the 2030 GHG target and define the state's climate change priorities to 2030 and beyond. The strategies' "known commitments" include implementing renewable energy and energy efficiency (including the mandates of SB 350), increased stringency of the Low Carbon Fuel Standard, measures identified in the Mobile Source and Freight Strategies, measures identified in the proposed Short-Lived Climate Pollutant Plan, and increased stringency of SB 375 targets. To fill the gap in additional reductions needed to achieve the 2030 target, it recommends continuing the Cap-and-Trade Program and a measure to reduce GHGs from refineries by 20%.

For local governments, the 2030 Scoping Plan replaced the initial Scoping Plan's 15% reduction goal with a recommendation to aim for a community-wide goal of no more than 6 MT CO_2e per capita by 2030 and no more than 2 MT CO_2e per capita by 2050, which are consistent with the state's long-term goals. These goals are also consistent with the Global Climate Leadership Memorandum of Understanding (Under 2 MOU) (Under 2 2017) and the Paris Agreement, which are developed around the scientifically based levels necessary to limit global warming below 2°C. The 2030 Scoping Plan recognizes the benefits of local government GHG planning (e.g., through climate action plans [CAPs]) and provides more information regarding tools CARB is working on to support those efforts. It also recognizes the CEQA streamlining provisions for project-level review where there is a legally adequate CAP.[11] The 2030 Scoping Plan was approved by CARB's Governing Board on December 14, 2017.

The 2030 Scoping Plan recommends strategies for implementation at the statewide level to meet the goals of AB 32, SB 32, and the EOs and establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions. A project is considered consistent with the statutes and EOs if it meets the general policies in reducing GHG emissions to facilitate the achievement of the state's goals and does not impede attainment of those goals. As discussed in several cases, a given project need not be in perfect conformity with every planning policy or goals to be consistent. A project would be consistent if it would further the objectives and not obstruct their attainment.

CARB's Regulations for the Mandatory Reporting of Greenhouse Gas Emissions. CARB's Regulation for the Mandatory Reporting of Greenhouse Gas Emissions (17 CCR 95100–95157) incorporated by reference certain requirements that EPA promulgated in its Final Rule on Mandatory Reporting of Greenhouse Gases (Title 40 Code of Federal Regulations, Part 98). Specifically, Section 95100(c) of the Mandatory Reporting Regulation incorporated those requirements that EPA promulgated in the Federal Register on October 30, 2009; July 12, 2010; September 22, 2010; October 28, 2010; November 30, 2010; December 17, 2010; and April 25, 2011. In general, entities subject to the Mandatory Reporting Regulation that emit over 10,000 MT CO_2e per year are required to report annual GHGs through the California Electronic GHG Reporting Tool. Certain sectors, such as refineries and cement plants, are required to report regardless of emission levels. Entities that emit more than the 25,000 MT CO_2e per year threshold are required to have their GHG emissions report verified by a CARB-accredited third party.

EO B-18-12. EO B-18-12 (April 2012) directed state agencies, departments, and other entities under the governor's executive authority to take action to reduce entity-wide GHG emissions by at least 10% by 2015 and 20% by 2020, as measured against a 2010 baseline. EO B-18-12 also established goals for existing state buildings for reducing grid-based energy purchases and water use.

[11] *Sierra Club v. County of Napa* (2004) 121 Cal.App.4th 1490; *San Francisco Tomorrow et al. v. City and County of San Francisco* (2015) 229 Cal.App.4th 498; *San Franciscans Upholding the Downtown Specific Plan v. City and County of San Francisco* (2002) 102 Cal.App.4th 656; *Sequoyah Hills Homeowners Assn. v. City of Oakland* (1993) 23 Cal.App.4th 704, 719.

EO B-30-15. EO B-30-15 (April 2015) identified an interim GHG reduction target in support of targets previously identified under S-3-05 and AB 32. EO B-30-15 set an interim target goal of reducing GHG emissions to 40% below 1990 levels by 2030 to keep California on its trajectory toward meeting or exceeding the long-term goal of reducing GHG emissions to 80% below 1990 levels by 2050 as set forth in S-3-05. To facilitate achieving this goal, EO B-30-15 called for CARB to update the Scoping Plan to express the 2030 target in terms of MMT CO_2e. The EO also called for state agencies to continue to develop and implement GHG emission reduction programs in support of the reduction targets.

SB 605 and SB 1383. SB 605 (2014) required CARB to complete a comprehensive strategy to reduce emissions of short-lived climate pollutants (SLCPs) in the state; and SB 1383 (2016) required CARB to approve and implement that strategy by January 1, 2018. SB 1383 also establishes specific targets for the reduction of SLCPs (40% below 2013 levels by 2030 for methane and HFCs, and 50% below 2013 levels by 2030 for anthropogenic black carbon), and provides direction for reductions from dairy and livestock operations and landfills. Accordingly, and as mentioned above, CARB adopted its Short-Lived Climate Pollutant Reduction Strategy (SLCP Reduction Strategy) in March 2017. The SLCP Reduction Strategy establishes a framework for the statewide reduction of emissions of black carbon, methane, and fluorinated gases.

EO B-55-18. EO B-55-18 (September 2018) establishes a new statewide goal "to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter." This executive order directs CARB to "work with relevant state agencies to ensure future Scoping Plans identify and recommend measures to achieve the carbon neutrality goal."

Building Energy

Title 24, Part 6. Title 24 of the California Code of Regulations was established in 1978 and serves to enhance and regulate California's building standards. While not initially promulgated to reduce GHG emissions, Part 6 of Title 24 specifically established Building Energy Efficiency Standards that are designed to ensure new and existing buildings in California achieve energy efficiency and preserve outdoor and indoor environmental quality. These energy efficiency standards are reviewed every few years by the Building Standards Commission and the California Energy Commission (CEC) (and revised if necessary) (California Public Resources Code, Section 25402[b][1]). The regulations receive input from members of industry, as well as the public, with the goal of "reducing of wasteful, uneconomic, inefficient, or unnecessary consumption of energy" (California Public Resources Code, Section 25402). These regulations are carefully scrutinized and analyzed for technological and economic feasibility (California Public Resources Code, Section 25402[d]) and cost effectiveness (California Public Resources Code, Sections 25402[b][2] and [b][3]). As a result, these standards save energy, increase electricity supply reliability, increase indoor comfort, avoid the need to construct new power plants, and help preserve the environment. The 2016 Title 24 building energy efficiency standards became effective January 1, 2017. The 2019 Title 24 Building Energy Efficiency Standards became effective on January 1, 2020, which will further reduce energy used and associated GHG emissions compared to the 2016 Title 24 building energy standards. Residential buildings built to the 2019 standards are anticipated to use an estimated 53% less energy than those built to the 2016 standards (CEC 2018).

Title 24, Part 11. In addition to the CEC's efforts, in 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (Part 11 of Title 24) is commonly referred to as California's Green Building Standards (CALGreen), and establishes minimum mandatory standards as well as voluntary standards pertaining to the planning and design of sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation,

and interior air quality. The CALGreen standards took effect in January 2011 and instituted mandatory minimum environmental performance standards for all ground-up, new construction of commercial, low-rise residential and state-owned buildings and schools and hospitals. The CALGreen 2016 standards became effective January 1, 2017 (CALGreen 2016). The mandatory standards require the following (24 CCR Part 11):

- Mandatory reduction in indoor water use through compliance with specified flow rates for plumbing fixtures and fittings.
- Mandatory reduction in outdoor water use through compliance with a local water efficient landscaping ordinance or the California Department of Water Resources' Model Water Efficient Landscape Ordinance.
- 65% of construction and demolition waste must be diverted from landfills.
- Mandatory inspections of energy systems to ensure optimal working efficiency.
- Inclusion of electric vehicle charging stations or designated spaces capable of supporting future charging stations.
- Low-pollutant emitting exterior and interior finish materials, such as paints, carpets, vinyl flooring, and particle boards.

The CALGreen standards also include voluntary efficiency measures that are provided at two separate tiers and implemented at the discretion of local agencies and applicants. CALGreen's Tier 1 standards call for a 15% improvement in energy requirements, stricter water conservation, 65% diversion of construction and demolition waste, 10% recycled content in building materials, 20% permeable paving, and 20% cement reduction. CALGreen's more rigorous Tier 2 standards call for a 30% improvement in energy requirements, stricter water conservation, 80% diversion of construction and demolition waste, 15% recycled content in building materials, 30% permeable paving, and 25% cement reduction.

The California Public Utilities Commission (CPUC), CEC, and CARB also have a shared, established goal of achieving zero net energy performance for new construction in California. The key policy timelines include (1) all new residential construction in California will be zero net energy by 2020 and (2) all new commercial construction in California will be zero net energy by 2030.[12]

Title 20. Title 20 of the California Code of Regulations requires manufacturers of appliances to meet state and federal standards for energy and water efficiency. The CEC certifies an appliance based on a manufacturer's demonstration that the appliance meets the standards. New appliances regulated under Title 20 include refrigerators, refrigerator-freezers, and freezers; room air conditioners and room air-conditioning heat pumps; central air conditioners; spot air conditioners; vented gas space heaters; gas pool heaters; plumbing fittings and plumbing fixtures; fluorescent lamp ballasts; lamps; emergency lighting; traffic signal modules; dishwashers; clothes washers and dryers; cooking products; electric motors; low-voltage dry-type distribution transformers; power supplies; televisions and consumer audio and video equipment; and battery charger systems. Title 20 presents protocols for testing each type of appliance covered under the regulations, and appliances must meet the standards for energy performance, energy design, water performance and water design. Title 20 contains three types of standards for appliances: federal and state standards for federally regulated appliances, state standards for federally regulated appliances, and state standards for non-federally regulated appliances.

[12] See for example, CPUC 2013. It is expected that achievement of the zero net energy goal will occur via revisions to the Title 24 standards.

SB 1. SB 1 (August 2006) established a $3 billion rebate program to support the goal of the state to install rooftop solar energy systems with a generation capacity of 3,000 megawatts through 2016. SB 1 added sections to the California Public Resources Code, including Chapter 8.8 (California Solar Initiative), that require building projects applying for ratepayer-funded incentives for photovoltaic systems to meet minimum energy efficiency levels and performance requirements. Section 25780 established that it is a goal of the state to establish a self-sufficient solar industry. The goals included establishing solar energy systems as a viable mainstream option for both homes and businesses within 10 years of adoption, and placing solar energy systems on 50% of new homes within 13 years of adoption. SB 1, also termed "Go Solar California," was previously titled "Million Solar Roofs."

AB 1470 (Solar Water Heating). This bill established the Solar Water Heating and Efficiency Act of 2007. The bill makes findings and declarations of the legislature relating to the promotion of solar water heating systems and other technologies that reduce natural gas demand. The bill defines several terms for purposes of the act. The bill requires the commission to evaluate the data available from a specified pilot program, and, if it makes a specified determination, to design and implement a program of incentives for the installation of 200,000 solar water heating systems in homes and businesses throughout the state by 2017.

Renewable Energy and Energy Procurement

SB 1078. SB 1078 (September 2002) established the Renewables Portfolio Standard (RPS) program, which required an annual increase in renewable generation by utilities equivalent to at least 1% of sales, with an aggregate goal of 20% by 2017. This goal was subsequently accelerated, requiring utilities to obtain 20% of their power from renewable sources by 2010 (see SB 107, EO S-14-08, and S-21-09).

SB 1368. SB 1368 (September 2006) required the CEC to develop and adopt regulations for GHG emission performance standards for the long-term procurement of electricity by local publicly owned utilities. These standards must be consistent with the standards adopted by the CPUC.

AB 1109. Enacted in 2007, AB 1109 required the CEC to adopt minimum energy efficiency standards for general-purpose lighting and to reduce electricity consumption 50% for indoor residential lighting and 25% for indoor commercial lighting.

EO S-14-08. EO S-14-08 (November 2008) focused on the contribution of renewable energy sources to meet the electrical needs of California while reducing the GHG emissions from the electrical sector. This EO required that all retail suppliers of electricity in California serve 33% of their load with renewable energy by 2020. Furthermore, the EO directed state agencies to take appropriate actions to facilitate reaching this target. The California Natural Resources Agency (CNRA), through collaboration with the CEC and California Department of Fish and Wildlife, was directed to lead this effort.

EO S-21-09 and SB X1-2. EO S-21-09 (September 2009) directed CARB to adopt a regulation consistent with the goal of EO S-14-08 by July 31, 2010. CARB was further directed to work with the CPUC and CEC to ensure that the regulation builds upon the RPS program and was applicable to investor-owned utilities, publicly owned utilities, direct access providers, and community choice providers. Under this order, CARB was to give the highest priority to those renewable resources that provide the greatest environmental benefits with the least environmental costs and impacts on public health and can be developed the most quickly in support of reliable, efficient, cost-effective electricity system operations. On September 23, 2010, CARB initially approved regulations to implement a Renewable Electricity Standard. However, this regulation was not finalized because of subsequent legislation (SB X1-2) signed by Governor Brown in April 2011.

SB X1-2 expanded the RPS by establishing a renewable energy target of 20% of the total electricity sold to retail customers in California per year by December 31, 2013, and 33% by December 31, 2020, and in subsequent years. Under the bill, a renewable electrical generation facility is one that uses biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric generation (30 megawatts or less), digester gas, municipal solid waste conversion, landfill gas, ocean wave, ocean thermal, or tidal current, and that meets other specified requirements with respect to its location.

SB X1-2 applies to all electricity retailers in the state including publicly owned utilities, investor-owned utilities, electricity service providers, and community choice aggregators. All of these entities must meet the renewable energy goals previously listed.

Supreme Court Ruling in Center for Biological Diversity v. Department of Fish and Wildlife

In its 2015 decision, *Center for Biological Diversity v. Department of Fish and Wildlife*, S217763 (Newhall),[13] the California Supreme Court evaluated the California Department of Fish and Wildlife's analysis of potential impacts caused by GHG emissions contained in the environmental impact report (EIR) for the proposed land development called Newhall Ranch. In the EIR, the California Department of Fish and Wildlife analyzed GHG emissions under AB 32, using the business-as-usual comparison as its sole criterion of significance.

In Newhall, the California Supreme Court concluded that a finding of consistency with meeting statewide emission reduction goals is a legally permissible criterion of significance when analyzing potential impacts of GHG emissions under CEQA. However, the Court found that the EIR's conclusion that the project's emissions would be less than significant under that criterion was not supported by substantial evidence, and remanded back to the appellate court the narrow issue of whether substantial evidence supported the application of AB 32 statewide GHG reduction goal of 29% to new land use projects.

The Court then identified potential options for lead agencies evaluating cumulative significance of a proposed land use development's GHG emissions in future CEQA documents:

1. Business-As-Usual Model: While the Court cautions that the Scoping Plan may not be appropriate at the project level, the business-as-usual model might be used to determine what level of reduction from business-as-usual a new land use development at the proposed location must contribute in order to comply with statewide goals pursuant to AB 32.
2. Compliance With Regulatory Programs Designed To Reduce Greenhouse Gas Emissions: The Court suggests that a lead agency could rely on a showing of compliance with regulatory programs designed to reduce GHG emissions. The Court clarifies that a significance analysis based on compliance with such statewide regulations only goes to impacts within the area governed by the regulations.
3. Local CAP or Other "Geographically Specific Greenhouse Gas Emission Reduction Plans": The Court points out that these plans may provide a basis for the tiering or streamlining of project-level CEQA analysis, so long as the plan is "sufficiently detailed and adequately supported." Increase the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard requiring fuel producers to use at least 36 billion gallons of biofuel in 2022.

[13] The Newhall decision is available at https://caselaw.findlaw.com/ca-supreme-court/1719578.html (accessed November 2018).

4. Regional SCS: The Court also articulates that a lead agency need not additionally analyze GHG emissions from cars and light trucks in CEQA documents for certain residential, mixed-use, and transit priority projects that are consistent with an applicable SCS adopted pursuant to SB 375.
5. Numerical GHG Significance Thresholds: The Court noted the use of such thresholds are GHG significance thresholds, which are based on compliance with AB 32, and use a "service population" GHG ratio threshold for land use projects and a 10,000-ton annual GHG emission threshold for industrial projects. The Court remanded for further consideration the application of the 29% overall Scoping Plan metric, which is used by several air districts and, like the favorably cited Bay Area Air Quality Management District metric, is based on AB 32.

Citing to EOs S-3-05 and B-30-15, the Court cautioned that those EIRs taking a goal-consistency approach to CEQA significance may in the future need to consider the project's effects on meeting emissions reduction targets beyond 2020.

SB 350. SB 350 (October 2015) further expanded the RPS by establishing a goal of 50% of the total electricity sold to retail customers in California per year by December 31, 2030. In addition, SB 350 included the goal to double the energy-efficiency savings in electricity and natural gas final end uses (e.g., heating, cooling, lighting, or class of energy uses on which an energy-efficiency program is focused) of retail customers through energy conservation and efficiency. The bill also requires the CPUC, in consultation with the CEC, to establish efficiency targets for electrical and gas corporations consistent with this goal.

SB 100. SB 100 (2018) increased the standards set forth in SB 350 establishing that 44% of the total electricity sold to retail customers in California per year by December 31, 2024, 52% by December 31, 2027, and 60% by December 31, 2030, be secured from qualifying renewable energy sources. SB 100 states that it is the policy of the state that eligible renewable energy resources and zero-carbon resources supply 100% of the retail sales of electricity to California. This bill requires that the achievement of 100% zero-carbon electricity resources do not increase the carbon emissions elsewhere in the western grid and that the achievement not be achieved through resource shuffling.

Mobile Sources

AB 1493. AB 1493 (July 2002) was enacted in a response to the transportation sector accounting for more than half of California's CO_2 emissions. AB 1493 required CARB to set GHG emission standards for passenger vehicles, light-duty trucks, and other vehicles determined by the state board to be vehicles that are primarily used for noncommercial personal transportation in the state. The bill required that CARB set GHG emission standards for motor vehicles manufactured in 2009 and all subsequent model years. CARB adopted the standards in September 2004. The near-term (2009–2012) standards result in a reduction of about 22% in GHG emissions compared to the emissions from the 2002 fleet, while the mid-term (2013–2016) standards result in a reduction of about 30%.

Heavy Duty Diesel. CARB adopted the final Heavy Duty Truck and Bus Regulation, Title 13, Division 3, Chapter 1, Section 2025, on December 31, 2014, to reduce PM and NO_x emissions from heavy-duty diesel vehicles. The rule requires PM filters be applied to newer heavier trucks and buses by January 1, 2012, with older vehicles required to comply by January 1, 2015. The rule will require nearly all diesel trucks and buses to be compliant with the 2010 model year engine requirement by January 1, 2023. CARB also adopted an Airborne Toxic Control Measure to limit idling of diesel-fueled commercial vehicles on December 12, 2013. This rule requires diesel-fueled vehicles with gross vehicle weights greater than 10,000 pounds to idle no more than 5 minutes at any location (13 CCR 2485).

EO S-1-07. EO S-1-07 (January 2007, implementing regulation adopted in April 2009) sets a declining Low Carbon Fuel Standard for GHG emissions measured in CO_2e grams per unit of fuel energy sold in California. The target of the Low Carbon Fuel Standard is to reduce the carbon intensity of California passenger vehicle fuels by at least 10% by 2020 (17 CCR 95480 et seq.). The carbon intensity measures the amount of GHG emissions in the lifecycle of a fuel, including extraction/feedstock production, processing, transportation, and final consumption, per unit of energy delivered.

SB 375. SB 375 (September 2008) addresses GHG emissions associated with the transportation sector through regional transportation and sustainability plans. SB 375 requires CARB to adopt regional GHG reduction targets for the automobile and light-truck sector for 2020 and 2035 and to update those targets every 8 years. SB 375 requires the state's 18 regional MPOs to prepare an SCS as part of their Regional Transportation Plan (RTP) that will achieve the GHG reduction targets set by CARB. If an MPO is unable to devise an SCS to achieve the GHG reduction target, the MPO must prepare an Alternative Planning Strategy demonstrating how the GHG reduction target would be achieved through alternative development patterns, infrastructure, or additional transportation measures or policies.

Pursuant to California Government Code Section 65080(b)(2)(K), an SCS does not (1) regulate the use of land; (2) supersede the land use authority of cities and counties; or (3) require that a city's or county's land use policies and regulations, including those in a general plan, be consistent with it. Nonetheless, SB 375 makes regional and local planning agencies responsible for developing those strategies as part of the federally required metropolitan transportation planning process and the state-mandated housing element process.

In 2010, CARB adopted the SB 375 targets for the regional MPOs. The targets for SANDAG are a 7% reduction in emissions per capita by 2020 and a 13% reduction by 2035.

SANDAG completed and adopted its 2050 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) in October 2011 (SANDAG 2011). In November 2011, CARB, by resolution, accepted SANDAG's GHG emissions quantification analysis and determination that, if implemented, the SCS would achieve CARB's 2020 and 2035 GHG emissions reduction targets for the region.

After SANDAG's 2050 RTP/SCS was adopted, a lawsuit was filed by the Cleveland National Forest Foundation and others. The case was decided in July 2017, and the court found that the EIR did not have to use EO S-3-05's 2050 goal of an 80% reduction in GHG emissions from 1990 levels as a threshold because the EIR sufficiently informed the public of the potential impacts.

Although the EIR for SANDAG's 2050 RTP/SCS is pending before the California Supreme Court, in 2015, SANDAG adopted the next iteration of its RTP/SCS in accordance with statutorily mandated timelines, and no subsequent litigation challenge was filed. More specifically, in October 2015, SANDAG adopted San Diego Forward: The Regional Plan. Like the 2050 RTP/SCS, this planning document meets CARB's 2020 and 2035 reduction targets for the region (SANDAG 2015). In December 2015, CARB, by resolution, accepted SANDAG's GHG emissions quantification analysis and determination that, if implemented, the SCS would achieve CARB's 2020 and 2035 GHG emissions reduction targets for the region. In March 2018, CARB approved updates to the SB 375 GHG emission reduction targets, including a reduction of 15% reduction in emissions per capita by 2020 and a 19% reduction by 2035 for SANDAG. SANDAG will demonstrate progress towards meeting the updated GHG emission reduction targets in the next update to the RTP/SCS.

In February 2019, the SANDAG Board of Directors approved an action plan that extended development of a new vision for the 2021 Regional Plan to late 2021. While work progresses, SANDAG prepared a 2019 Federal

Transportation Plan (2019 Federal RTP) that builds on San Diego Forward: The Regional Plan with updated project costs and revenues and a new regional growth forecast. The 2019 Federal RTP is consistent with the Final EIR for the 2015 Regional Plan.

Advanced Clean Cars Program and Zero-Emissions Vehicle Program. The Advanced Clean Cars Program (January 2012) is an emissions-control program for model years 2015 through 2025. The program combines the control of smog- and soot-causing pollutants and GHG emissions into a single coordinated package. The package includes elements to reduce smog-forming pollution, reduce GHG emissions, promote clean cars, and provide the fuels for clean cars (CARB 2011). To improve air quality, CARB has implemented new emission standards to reduce smog-forming emissions beginning with 2015 model year vehicles. It is estimated that in 2025 cars will emit 75% less smog-forming pollution than the average new car sold today. To reduce GHG emissions, CARB, in conjunction with the EPA and the NHTSA, adopted new GHG standards for model year 2017 to 2025 vehicles; the new standards are estimated to reduce GHG emissions by 34% in 2025. The Zero-Emission Vehicle Program will act as the focused technology of the Advanced Clean Cars Program by requiring manufacturers to produce increasing numbers of zero-emission vehicles and plug-in hybrid electric vehicles in the 2018 to 2025 model years.

EO B-16-12. EO B-16-12 (March 2012) required that state entities under the governor's direction and control support and facilitate the rapid commercialization of zero-emission vehicles. It ordered CARB, CEC, CPUC, and other relevant agencies to work with the Plug-in Electric Vehicle Collaborative and the California Fuel Cell Partnership to establish benchmarks to help achieve benchmark goals by 2015, 2020, and 2025. On a statewide basis, EO B-16-12 established a target reduction of GHG emissions from the transportation sector equaling 80% less than 1990 levels by 2050. This directive did not apply to vehicles that have special performance requirements necessary for the protection of the public safety and welfare.

AB 1236. AB 1236 (October 2015) required a city, county, or city and county to approve an application for the installation of electric vehicle charging stations, as defined, through the issuance of specified permits unless the city or county makes specified written findings based upon substantial evidence in the record that the proposed installation would have a specific, adverse impact upon the public health or safety, and there is no feasible method to satisfactorily mitigate or avoid the specific, adverse impact. The bill provided for appeal of that decision to the planning commission, as specified. The bill provided that the implementation of consistent statewide standards to achieve the timely and cost-effective installation of electric vehicle charging stations is a matter of statewide concern. The bill required electric vehicle charging stations to meet specified standards. The bill required a city, county, or city and county with a population of 200,000 or more residents to adopt an ordinance, by September 30, 2016, that created an expedited and streamlined permitting process for electric vehicle charging stations, as specified. The bill also required a city, county, or city and county with a population of less than 200,000 residents to adopt this ordinance by September 30, 2017.

Water

EO B-29-15. In response to the ongoing drought in California, EO B-29-15 (April 2015) set a goal of achieving a statewide reduction in potable urban water usage of 25% relative to water use in 2013. The term of the EO extended through February 28, 2016, although many of the directives have become permanent water-efficiency standards and requirements. The EO includes specific directives that set strict limits on water usage in the state. In response to EO B-29-15, the California Department of Water Resources has modified and adopted a revised version of the Model Water Efficient Landscape Ordinance that, among other changes, significantly increases the requirements for landscape water use efficiency and broadens its applicability to include new development projects with smaller landscape areas.

Solid Waste

AB 939 and AB 341. In 1989, AB 939, known as the Integrated Waste Management Act (California Public Resources Code, Sections 40000 et seq.), was passed because of the increase in waste stream and the decrease in landfill capacity. The statute established the California Integrated Waste Management Board, which oversees a disposal reporting system. AB 939 mandated a reduction of waste being disposed where jurisdictions were required to meet diversion goals of all solid waste through source reduction, recycling, and composting activities of 25% by 1995 and 50% by the year 2000.

AB 341 amended the California Integrated Waste Management Act of 1989 to include a provision declaring that it is the policy goal of the state that not less than 75% of solid waste generated be source-reduced, recycled, or composted by the year 2020, and annually thereafter. In addition, AB 341 required the California Department of Resources Recycling and Recovery (CalRecycle) to develop strategies to achieve the state's policy goal. CalRecycle conducted several general stakeholder workshops and several focused workshops, and in August 2015 published a discussion document titled AB 341 Report to the Legislature, which identifies five priority strategies that CalRecycle believes would assist the state in reaching the 75% goal by 2020, legislative and regulatory recommendations, and an evaluation of program effectiveness (CalRecycle 2015).

Other State Actions

SB 97. SB 97 (August 2007) directed the Governor's Office of Planning and Research to develop guidelines under CEQA for the mitigation of GHG emissions. In 2008, Office of Planning and Research issued a technical advisory as interim guidance regarding the analysis of GHG emissions in CEQA documents. The advisory indicated that the lead agency should identify and estimate a project's GHG emissions, including those associated with vehicular traffic, energy consumption, water usage, and construction activities (OPR 2008). The advisory further recommended that the lead agency determine significance of the impacts and impose all mitigation measures necessary to reduce GHG emissions to a level that is less than significant. The CNRA adopted the CEQA Guidelines amendments in December 2009, which became effective in March 2010.

Under the amended CEQA Guidelines, a lead agency has the discretion to determine whether to use a quantitative or qualitative analysis or apply performance standards to determine the significance of GHG emissions resulting from a particular project (14 CCR 15064.4[a]). The CEQA Guidelines require a lead agency to consider 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 (14 CCR 15064.4[b]). The CEQA Guidelines also allow a lead agency to consider feasible means of mitigating the significant effects of GHG emissions, including reductions in emissions through the implementation of project features or off-site measures. The adopted amendments do not establish a GHG emission threshold, instead allowing a lead agency to develop, adopt, and apply its own thresholds of significance or those developed by other agencies or experts. The CNRA also acknowledges that a lead agency may consider compliance with regulations or requirements implementing AB 32 in determining the significance of a project's GHG emissions.

With respect to GHG emissions, the CEQA Guidelines state in Section 15064.4(a) that lead agencies should "make a good faith effort, to the extent possible on scientific and factual data, to describe, calculate or estimate" GHG emissions. The CEQA Guidelines note that an agency may identify emissions by either selecting a "model or methodology" to quantify the emissions or by relying on "qualitative analysis or other performance based standards" (14 CCR 15064.4[a]). Section 15064.4(b) states that the lead agency should consider the following when assessing the significance of impacts from GHG emissions on the environment: (1) the extent a project may

increase or reduce GHG emissions as compared to the existing environmental setting; (2) whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; and (3) 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 (14 CCR 15064.4[b]).

EO S-13-08. EO S-13-08 (November 2008) is intended to hasten California's response to the impacts of global climate change, particularly sea-level rise. Therefore, the EO directs state agencies to take specified actions to assess and plan for such impacts. The final 2009 California Climate Adaptation Strategy report was issued in December 2009 (CNRA 2009), and an update, Safeguarding California: Reducing Climate Risk, followed in July 2014 (CNRA 2014). To assess the state's vulnerability, the report summarizes key climate change impacts to the state for the following areas: agriculture, biodiversity and habitat, emergency management, energy, forestry, ocean and coastal ecosystems and resources, public health, transportation, and water. Issuance of the Safeguarding California: Implementation Action Plans followed in March 2016 (CNRA 2016). In January 2018, the CNRA released the Safeguarding California Plan: 2018 Update, which communicates current and needed actions that state government should take to build climate change resiliency (CNRA 2018a).

2015 State of the State Address. In January 2015, Governor Brown in his inaugural address and annual report to the legislature established supplementary goals that would further reduce GHG emissions over the next 15 years. These goals include an increase in California's renewable energy portfolio from 33% to 50%, a reduction in vehicle petroleum use for cars and trucks by up to 50%, doubling the efficiency of existing buildings, and decreasing emissions associated with heating fuels.

2016 State of the State Address. In his January 2016 address, Governor Brown established a statewide goal to bring per-capita GHG emissions down to 2 tons per person, which reflects the goal of the Under 2 MOU to limit global warming to less than 2°C by 2050. The Under 2 MOU agreement pursues emission reductions of 80% to 95% below 1990 levels by 2050 and/or reaching a per-capita annual emissions goal of less than 2 MT by 2050. A total of 135 jurisdictions representing 32 countries and 6 continents, including California, have signed or endorsed the Under 2 MOU (Under 2 2017).

3.2.3 Local Regulations

3.2.3.1 San Diego Air Pollution Control District

SDAPCD does not have established GHG rules, regulations, or policies.

3.2.3.2 City of Solana Beach

General Plan

The City's General Plan (City of Solana Beach 2014) includes smart growth and land use planning principles designed to reduce vehicle miles traveled and result in a reduction in GHG emissions. As discussed in the General Plan, climate change and GHG reduction policies are addressed in plans and programs in multiple elements of the General Plan.

The policies for reduction of GHG emissions in the General Plan are as follows:

- **Policy LU-1.6:** Encourage the establishment of mixed-uses that provide for housing and jobs near transit routes, shopping areas, and recreational uses to promote public transit use, walking, and biking.

- **Policy LU-2.2** Encourage appropriate smart growth, transit, residential, or mixed-use projects.
- **Policy LU-3.1** Concentrate commercial, mixed-use, and medium to high density residential development along transit corridors and near activity centers that can be served efficiently by public transit and alternative transportation modes.
- **Policy LU-3.2** Enable residents to reduce their commutes by allowing and encouraging the creation of live/work units for artists, craftspeople, and other professions, promoting home occupations and telecommuting, and supporting other means of achieving a jobs/housing balance.
- **Policy LU-3.3** Identify and prioritize infrastructure improvements needed to support increased use of alternatives to private vehicle travel, including transit, bicycle, and pedestrian modes.

City of Solana Beach Climate Action Plan

The City adopted its CAP on July 12, 2017 (City of Solana Beach 2017). The CAP acts as a roadmap to address challenges of climate change within the City. The CAP includes a baseline GHG emissions inventory for 2010, GHG emissions forecasts for 2020 and 2035 (as recommended by the 2008 CARB Scoping Plan), local GHG emissions reduction strategies and measures to help the City achieve the 2035 target, climate adaptation measures for the City, and implementation and monitoring mechanisms to ensure the City's measures and targets are achieved. The CAP established GHG emissions reduction goals of 15% below 2010 levels by 2020 and 50% below 2010 levels by 2035. It should be noted that the 2030 state goal was not available when the CAP process was initiated by the City but the 2030 goal would lie along with the trajectory to meet 2035 goals. The CAP was not prepared in accordance with the requirements within CEQA Guidelines Section 15183.5 and thus is not considered a qualified GHG emission reduction plan and cannot be used to tier from for CEQA.

3.3 Greenhouse Gas Inventories and Climate Change Conditions

3.3.1 Sources of Greenhouse Gas Emissions

Per the EPA's Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2017, total U.S. GHG emissions were approximately 6,457 MMT CO_2e in 2017 (EPA 2019b). The primary GHG emitted by human activities in the United States was CO_2, which represented approximately 81.6% of total GHG emissions (6,457 MMT CO_2e). The largest source of CO_2, and of overall GHG emissions, was fossil-fuel combustion, which accounted for approximately 93.2% of CO_2 emissions in 2017 (4,912.0 MMT CO_2e). Relative to the 1990 emissions level, gross U.S. GHG emissions in 2017 were 1.3% higher; however, the gross emissions are down from a high of 15.7% above the 1990 level that occurred in 2007. GHG emissions decreased from 2016 to 2017 by 0.5% (35.5 MMT CO_2e) and, overall, net emissions in 2017 were 13% below 2005 levels (EPA 2019b).

According to California's 2000–2017 GHG emissions inventory (2018 edition), California emitted 429.4 MMT CO_2e in 2016, including emissions resulting from out-of-state electrical generation (CARB 2018a). The sources of GHG emissions in California include transportation, industrial uses, electric power production from both in-state and out-of-state sources, commercial and residential uses, agriculture, high GWP substances, and recycling and waste. The California GHG emission source categories (as defined in CARB's 2008 Scoping Plan) and their relative contributions in 2016 are presented in Table 9.

Table 9. Greenhouse Gas Emissions Sources in California

Source Category	Annual GHG Emissions (MMT CO_2e)	Percent of Total[a]
Transportation	169.38	41%
Industrial	89.61	23%
Electric power[b]	68.58	16%
Commercial and residential	39.36	12%
Agriculture	33.84	8%
High GWP substances	19.78	4%
Recycling and waste	8.81	2%
Total	**429.4**	**100%**

Source: CARB 2018a.
Notes: GHG = greenhouse gas; MMT CO_2e = million metric tons of carbon dioxide equivalent; GWP = global warming potential. Emissions reflect the 2016 California GHG inventory.
[a] Percentage of total has been rounded, and total may not sum due to rounding.
[b] Includes emissions associated with imported electricity, which account for 26.28 MMT CO_2e annually.

During the 2000 to 2016 period, per-capita GHG emissions in California have continued to drop from a peak in 2001 of 14.0 MT per person to 10.8 MT per person in 2016, representing a 23% decrease. In addition, total GHG emissions in 2016 were approximately 12 MMT CO_2e less than 2015 emissions. The declining trend in GHG emissions, coupled with programs that will continue to provide additional GHG reductions going forward, demonstrates that California is just below the 2020 target of 431 MMT CO_2e (CARB 2018a).

The City's community-wide GHG emissions baseline inventory in 2010 was estimated to be 139,216 MT CO_2e (City of Solana Beach 2017) Transportation is the largest contributor to the emissions, accounting for 63% (or 88,049 MT CO_2e) of the City's 2010 total, followed by electricity at 20% (or 27,182 MT CO_2e) of the emissions. Accounting for future population and economic growth, the City projects GHG emissions of 131,868 MT CO_2e in 2020 and 142,707 MT CO_2e in 2035. The projections assume population, housing, employment, and transportation activity will continue to grow over time and does not account for GHG emission reductions associated with implementation of the City's Climate Action Plan or legislative reductions (City Solana Beach 2017).

3.3.2 Potential Effects of Climate Change

Globally, climate change has the potential to affect numerous environmental resources through uncertain impacts related to future air temperatures and precipitation patterns. The 2014 Intergovernmental Panel on Climate Change Synthesis Report indicated that warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. Signs that global climate change has occurred include warming of the atmosphere and ocean, diminished amounts of snow and ice, and rising sea levels (IPCC 2014b).

In California, climate change impacts have the potential to affect sea-level rise, agriculture, snowpack and water supply, forestry, wildfire risk, public health, and electricity demand and supply. The primary effect of global climate change has been a rise in average global tropospheric temperature. The primary effect of global climate change has been a rise in average global tropospheric temperature. Reflecting the long-term warming trend since pre-industrial times, observed mean surface temperature for the decade 2006–2015 was 0.87°C (likely between 0.75°C and 0.99°C) higher than the average over the 1850–1900 period (IPCC 2018). Scientific modeling predicts that continued emissions of GHGs at or above current rates would induce more extreme climate changes during the twenty-first century than were observed during the twentieth century. Human activities are estimated to have caused approximately 1.0°C (1.8°F) of global warming above pre-industrial levels, with a likely range of 0.8°C to

1.2°C (1.4°F to 2.2°F) (IPCC 2018). Global warming is likely to reach 1.5°C (2.7°F) between 2030 and 2052 if it continues to increase at the current rate (IPCC 2018).

Although climate change is driven by global atmospheric conditions, climate change impacts are felt locally. A scientific consensus confirms that climate change is already affecting California. The Office of Environmental Health Hazard Assessment identified various indicators of climate change in California, which are scientifically based measurements that track trends in various aspects of climate change. Many indicators reveal discernible evidence that climate change is occurring in California and is having significant, measurable impacts in the state. Changes in the state's climate have been observed, including an increase in annual average air temperature with record warmth from 2012 to 2016, more frequent extreme heat events, more extreme drought, a decline in winter chill, an increase in cooling degree days and a decrease in heating degree days, and an increase in variability of statewide precipitation (OEHHA 2018).

Warming temperatures and changing precipitation patterns have altered California's physical systems—the ocean, lakes, rivers, and snowpack—upon which the state depends. Winter snowpack and spring snowmelt runoff from the Sierra Nevada and southern Cascade Mountains provide approximately one-third of the state's annual water supply. Impacts of climate on physical systems have been observed, such as high variability of snow-water content (i.e., amount of water stored in snowpack), decrease in snowmelt runoff, glacier change (loss in area), rise in sea levels, increase in average lake water temperature and coastal ocean temperature, and a decrease in dissolved oxygen in coastal waters (OEHHA 2018).

Impacts of climate change on biological systems, including humans, wildlife, and vegetation, have also been observed, including climate change impacts on terrestrial, marine, and freshwater ecosystems. As with global observations, species responses include those consistent with warming: elevational or latitudinal shifts in range, changes in the timing of key plant and animal life cycle events, and changes in the abundance of species and in community composition. Humans are better able to adapt to a changing climate than plants and animals in natural ecosystems. Nevertheless, climate change poses a threat to public health as warming temperatures and changes in precipitation can affect vector-borne pathogen transmission and disease patterns in California as well as the variability of heat-related deaths and illnesses. In addition, since 1950, the area burned by wildfires each year has been increasing.

The CNRA has released four California Climate Change Assessments (2006, 2009, 2012, and 2018), which have addressed the following: acceleration of warming across the state, more intense and frequent heat waves, greater riverine flows, accelerating sea level rise, more intense and frequent drought, more severe and frequent wildfires, more severe storms and extreme weather events, shrinking snowpack and less overall precipitation, and ocean acidification, hypoxia, and warming. To address local and regional governments need for information to support action in their communities, the Fourth Assessment (2018) includes reports for nine regions of the state, including the San Diego Region, where the project is located. Key projected climate changes for the San Diego Region include the following (CNRA 2018b):

- Temperature is projected to increase substantially, by 5°F to 10°F by the end of the twenty-first century. Along with mean temperature, heat wave frequency will increase and have more intensity and longer duration. Marine layer clouds can help to mitigate the impacts of temperature change in the coastal regions, though these clouds are not well represented in climate models, requiring further research.
- Precipitation will remain highly variable but will change in character, with wetter winters, drier springs, and more frequent and severe droughts punctuated by more intense individual precipitation events. Effects of an alter precipitation regime on ecosystems, water demand and supply, water quality, and flooding emergencies are incompletely known and will benefit from cross-disciplinary investigation.

- Broadly, wildfire risk will likely increase in the future as climate warms. The risk for large catastrophic wildfires driven by Santa Ana wind events will also likely increase as a result of a drier autumns leading to low antecedent precipitation before the height of the Santa Ana wind season (December and January).
- Sea level along the San Diego County coast is expected to rise approximately 1 foot or by mid-twenty-first century, and 3 feet or potentially much higher by 2100. For the next several decades, high tides combined with elevated shoreline water levels produced by both locally and distantly generated wind-driven waves will drive extreme events. Longer-term sea level rise will increase rapidly in the second half of the century and will be punctuated by short periods of storm-driven extreme sea levels that will imperil existing infrastructure, structures, and ecosystems with increasing frequency. San Diego is testing adaptation approaches, but sustained and improved observations in combination with physics based modeling are needed to evaluate these adaptations measures and guide future planning.
- Development in the San Diego County region is concentrated in the western third of the country with approximately 60% of the land remaining undeveloped. Climate change, along with development and fragmentation, will act as significant stressors to San Diego's natural lands, which are some of the most biodiverse in the United States. SANDAG's regional planning emphasis on smart growth to concentrate urban development near city and transit centers supports conservation while using mitigating GHG emissions.
- The San Diego County Water Authority, the region's water wholesaler, continues to diversify its supply by developing and negotiating local and nearby imported sources, developing more recycled water, and encouraging greater water conservation. There are several coordinated efforts in the region to build resilience to climate change and holistic water management adaptations are becoming more prevalent throughout communities. Continued science and regional coordination to evaluate climate change impacts on future water supply, demand, and quality are needed in order to inform adaptation to future climate changes.
- San Diego's energy supply is rapidly changing with renewable energy sources, mostly photovoltaic arrays, increasing by more than 30% since 2010, which introduces novel sensitivities to weather variation and evolving vulnerability to climate changes. San Diego Gas & Electric (SDG&E) has installed a high-density weather station network that provides a more detailed, real-time awareness of weather conditions that could damage the energy system and/or produce unusual supply or demand.
- Recent work in San Diego showed that heat-related health impacts are observed at lower temperatures in the coastal region than in the inland and desert regions. This is in part due to coastal residents being less acclimated to heat and less likely to have air conditioning.
- Climate changes felt by San Diego County will also occur in northern Baja, Mexico. Binational coordination of climate adaptation measures presents potential for significant benefit to communities on both sides of the border. However, to be effective the approaches must navigate the complexity posed by different governance and community structures.

A summary of current and future climate change impacts to resource areas in California, as discussed in the Safeguarding California: Reducing Climate Risk (CNRA 2014), is provided below.

Agriculture. Some of the specific challenges faced by the agricultural sector and farmers include more drastic and unpredictable precipitation and weather patterns; extreme weather events that range from severe flooding to extreme drought to destructive storm events; significant shifts in water availably and water quality; changes in pollinator lifecycles; temperature fluctuations, including extreme heat stress and decreased chill hours; increased risks from invasive species and weeds, agricultural pests and plant diseases; and disruptions to the transportation and energy infrastructure supporting agricultural production.

Biodiversity and Habitat. Specific climate change challenges to biodiversity and habitat include species migration in response to climatic changes, range shift, and novel combinations of species; pathogens, parasites and disease; invasive species; extinction risks; changes in the timing of seasonal life-cycle events; food web disruptions; and threshold effects (i.e., a change in the ecosystem that results in a "tipping point" beyond which irreversible damage or loss has occurred).

Energy. Specific climate change challenges for the energy sector include temperature, fluctuating precipitation patterns, increasing extreme weather events, and sea level rise.

Forestry. The most significant climate change–related risk to forests is accelerated risk of wildfire and more frequent and severe droughts. Droughts have resulted in more large-scale mortalities and combined with increasing temperatures have led to an overall increase in wildfire risks. Increased wildfire intensity subsequently increases public safety risks, property damage, fire suppression and emergency response costs, watershed and water quality impacts, and vegetation conversions.

Ocean and Coastal Ecosystems and Resources. Sea level rise, changing ocean conditions, and other climate change stressors are likely to exacerbate long-standing challenges related to ocean and coastal ecosystems in addition to threatening people and infrastructure located along the California coastline and in coastal communities. Sea level rise in addition to more frequent and severe coastal storms and erosion are threatening vital infrastructure such as roads, bridges, power plants, ports and airports, gasoline pipes, and emergency facilities as well as negatively impacting the coastal recreational assets such as beaches and tidal wetlands.

Public Health. Climate change can impact public health through various environmental changes and is the largest threat to human health in the twenty-first century. Changes in precipitation patterns affect public health primarily through potential for altered water supplies and extreme events such as heat, floods, droughts, and wildfires. Increased frequency, intensity, and duration of extreme heat and heat waves are likely to increase the risk of mortality due to heat-related illness, as well as exacerbate existing chronic health conditions. Other extreme weather events are likely to negatively impact air quality and increase or intensify respiratory illness such as asthma and allergies.

Transportation. While the transportation industry is a source of GHG emissions, it is also vulnerable to climate change risks. Increasing temperatures and extended periods of extreme heat threaten the integrity of the roadways and rail lines. High temperatures cause the road surfaces to expand, which leads to increased pressure and pavement buckling. High temperatures can also cause rail breakages, which could lead to train derailment. Other forms of extreme weather events, such as extreme storm events, can negatively impact infrastructure, which can impair movement of peoples and goods, or potentially block evacuation routes and emergency access roads. Increased wildfires, flooding, erosion risks, landslides, mudslides, and rockslides can all profoundly impact the transportation system and pose a serious risk to public safety.

Water. Climate change could seriously impact the timing, form, amount of precipitation, runoff patterns, and frequency and severity of precipitation events. Higher temperatures reduce the amount of snowpack and lead to earlier snowmelt, which can impact water supply availability, natural ecosystems, and winter recreation. Water supply availability during the intense dry summer months is heavily dependent on the snowpack accumulated during the wintertime. Increased risk of flooding has a variety of public health concerns including water quality, public safety, property damage, displacement, and post-disaster mental health problems. Prolonged and intensified droughts can also negatively impact groundwater reserves and result in increased overdraft and subsidence. The higher risk of wildfires can lead to increased erosion, which can negatively impact watersheds and result in poor water quality.

In March 2016, the CNRA released Safeguarding California: Implementation Action Plans, a document that shows how California is acting to convert the recommendations contained in the 2014 Safeguarding California plan into action (CNRA 2016). Additionally, in May 2017, CNRA released the draft Safeguarding California Plan: 2017 Update, which is a survey of current programmatic responses for climate change and contains recommendations for further actions (CNRA 2017).

The CNRA released Safeguarding California Plan: 2018 Update in January 2018, which provides a roadmap for state agencies to protect communities, infrastructure, services, and the natural environment from climate change impacts. The 2018 Safeguarding California Plan includes 69 recommendations across 11 sectors and more than 1,000 ongoing actions and next steps developed by scientific and policy experts across 38 state agencies (CNRA 2018a). As with previous state adaptation plans, the 2018 Update addresses the following: acceleration of warming across the state, more intense and frequent heat waves, greater riverine flows, accelerating sea level rise, more intense and frequent drought, more severe and frequent wildfires, more severe storms and extreme weather events, shrinking snowpack and less overall precipitation, and ocean acidification, hypoxia, and warming.

3.4 Significance Criteria and Methodology

3.4.1 Thresholds of Significance

The significance criteria used to evaluate the project's GHG emissions impacts are based on the recommendations provided in Appendix G of the CEQA Guidelines. For the purposes of this GHG emissions analysis, the project would have a significant environmental impact if it would (14 CCR 15000 et seq.):

1. Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.
2. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

As stated in CEQA Guidelines Section 15064.4(b)(1)-(3),

> a lead agency should consider the following factors, among others, when assessing the significance of impacts from GHG emissions on the environment: (1) the extent to which a project may increase or reduce GHG emissions as compared to the existing environmental setting; (2) whether project emissions exceed a threshold of significance that the lead agency determines applies to the project; and, (3) 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 greenhouse gas emissions.

Section 15064(h)(3) of the CEQA Guidelines also states that "A lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program that provides specific requirements that will avoid or substantially lessen the cumulative problem within the geographic area in which the project is located."

The CEQA Guidelines do not prescribe specific methodologies for performing an assessment, do not establish specific quantitative thresholds of significance, and do not mandate specific mitigation measures. Rather, the CEQA Guidelines emphasize the lead agency's discretion to determine the appropriate methodologies and thresholds of significance consistent with the manner in which other impact areas are handled in CEQA.

The Office of Planning and Research Technical Advisory titled CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act Review states that "public agencies are encouraged but not required to adopt thresholds of significance for environmental impacts. Even in the absence of clearly defined thresholds for GHG emissions, the law requires that such emissions from CEQA projects must be disclosed and mitigated to the extent feasible whenever the lead agency determines that the project contributes to a significant, cumulative climate change impact" (OPR 2008). Furthermore, the advisory document indicates that "in the absence of regulatory standards for GHG emissions or other scientific data to clearly define what constitutes a 'significant impact,' individual lead agencies may undertake a project-by-project analysis, consistent with available guidance and current CEQA practice."

Global climate change is a cumulative impact; a project participates in this potential impact through its incremental contribution combined with the cumulative increase of all other sources of GHGs. There are currently no established quantitative thresholds for assessing whether the GHG emissions of a project, such as the project, would be considered a cumulatively considerable contribution to global climate change; however, all reasonable efforts should be made to minimize a project's contribution to global climate change. In addition, while GHG impacts are recognized exclusively as cumulative impacts (CAPCOA 2008), GHG emissions impacts must also be evaluated on a project-level under CEQA.

City of Solana Beach

No bright-line threshold has been formally adopted by an air district or other lead agencies for use in the San Diego region. The California Air Pollution Control Officers Association (CAPCOA) recommended an interim 900 MT CO_2e screening level as a theoretical approach to identify projects that require further analysis and potential mitigation (CAPCOA 2008). The 900 MT CO_2e per year screening threshold was developed by CAPCOA based on data collection on various development applications submitted among four diverse cities, including the Cities of Los Angeles, Pleasanton, Dublin, and Livermore. Following the review of numerous pending applications within these four cities, an analysis was conducted to determine the threshold that would capture 90% or more of applications that would be required to conduct a full GHG analysis and implement GHG emission reduction measures as part of final project design. Following CAPCOA's analysis of development applications in various cities, it was determined that the threshold of 900 MT CO2E per year would achieve the objective of 90% capture and ensure that new development projects would keep the State of California on track to meet the goals of AB 32.

This 900 MT CO_2e screening level threshold is considered appropriate for small redevelopment projects. Consequently, the interim screening level recommended by the CAPCOA would be appropriate for the proposed project. The stationary bright-line threshold of 10,000 MT CO_2e, however, is inappropriate for the project because the project is not an industrial stationary permitted source with a single point of emissions (e.g., single exhaust pipe or release point). The 900 MT CO_2e threshold is applied to evaluate whether the project would generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.

The analysis for compliance with regulatory programs only applies to the individual area addressed by the regulatory program. If the proposed project is determined to have GHG emissions less than 900 MT CO_2e per year, then the project's cumulative contribution of GHG emissions would be considered less than significant. Conversely, if the proposed project is determined to exceed the 900 MT CO2E per year threshold, then the project's cumulative contribution of GHG emissions would be considered significant and feasible mitigation measures would be required.

Section 15183.5 also specifies that the project's CEQA analysis "must identify those requirements specified in the plan that apply to the project, and, if those requirements are not otherwise binding and enforceable, incorporate

those requirements as mitigation measures applicable to the project." As discussed in Section 3.2, there is no CAP that applies to this project.

3.4.2 Approach and Methodology

3.4.2.1 Construction

CalEEMod Version 2016.3.2 was used to estimate potential project-generated GHG emissions during construction. Construction of the project would result in GHG emissions primarily associated with use of off-road construction equipment, vendor (material delivery) trucks, and worker vehicles. All details for construction criteria air pollutants discussed in Section 2.4.2.1 are also applicable for the estimation of construction-related GHG emissions. As such, see Section 2.4.2.1 for a discussion of construction emissions calculation methodology and assumptions.

3.4.2.2 Operation

CalEEMod Version 2016.3.2 was used to estimate potential project-generated operational GHG emissions from area sources (landscape maintenance), energy sources (natural gas and electricity), mobile sources, solid waste, and water supply and wastewater treatment. Emissions from each category are discussed in the following text with respect to the project. For additional details, see Section 2.4.2.2, Operational Emissions, for a discussion of operational emission calculation methodology and assumptions, specifically for area, energy (natural gas and electricity), and mobile sources.

Area Sources

CalEEMod was used to estimate GHG emissions from the project's area sources, which include operation of gasoline-powered landscape maintenance equipment, which produce minimal GHG emissions. See Section 2.4.2.2 for a discussion of landscaping equipment emissions calculations. Consumer product use and architectural coatings result in VOC emissions, which are analyzed in air quality analysis only, and little to no GHG emissions.

Energy Sources

The estimation of operational energy emissions was based on CalEEMod land use defaults and total area (i.e., square footage) of the project's residential land use. The energy use from residential buildings were calculated based on CalEEMod energy intensity values (natural gas usage per square foot per year) from the Residential Appliance Saturation Survey database. The CalEEMod default assumes 2016 Title 24 Building Energy Efficiency Standards, but the project would be constructed when the 2019 Title 24 building energy standards would be effective. However, the reduction in energy was not quantified. Emissions are calculated by multiplying the energy use by the utility carbon intensity (pounds of GHGs per kilowatt-hour for electricity or 1,000 British thermal units for natural gas) for CO_2 and other GHGs. Annual natural gas and electricity emissions were estimated in CalEEMod using the emissions factors for SDG&E, which would be the energy source provider for the project.

CalEEMod default energy intensity factors (CO_2, CH_4, and N_2O mass emissions per kilowatt hour) for SDG&E are based on the value for SDG&E's energy mix in 2009. As explained in Section 3.2.2, SB X1-2 established a target of 33% from renewable energy sources for all electricity providers in California by 2020, and SB 350 calls for further development of renewable energy, with a target of 50% by 2030. The CO_2 emissions intensity factor for utility energy use in CalEEMod was adjusted consistent with SDG&E's 2017 Power Content Label, which reported that 44% of the power mix was generated by eligible renewable sources (CEC 2018). Because

SDG&E is striving to meet the 50% RPS by 2030, the CO_2 emissions intensity factor is to be less than assumed in CalEEMod at project operation (2023), which would reflect the increase in percentage of renewable energy in SDG&E's energy portfolio.

Mobile Sources

All details for criteria air pollutants discussed in Section 2.4.2.2 are also applicable for the estimation of operational mobile source GHG emissions.

Regulatory measures related to mobile sources include AB 1493 and related federal standards. AB 1493 required that CARB establish GHG emission standards for automobiles, light-duty trucks, and other vehicles determined by CARB to be vehicles that are primarily used for noncommercial personal transportation in the state. In addition, the NHTSA and EPA have established corporate fuel economy standards and GHG emission standards, respectively, for automobiles and light-, medium-, and heavy-duty vehicles. Implementation of these standards and fleet turnover (replacement of older vehicles with newer ones) will gradually reduce emissions from the project's motor vehicles. The effectiveness of fuel economy improvements was evaluated by using the CalEEMod emission factors for motor vehicles in 2023 to the extent it was captured in EMFAC 2014.[14]

Solid Waste

The project would generate solid waste and therefore result in CO_2e emissions associated with landfill off-gassing. CalEEMod default values for solid waste generation were used to estimate GHG emissions associated with solid waste. Project compliance with statewide solid waste diversion goals, including the 75% diversion rate by 2020 consistent with AB 341 (25% increase from the solid waste diversion requirements of AB 939, Integrated Waste Management Act), would reduce project-generated GHG emissions associated with solid waste disposal.

Water and Wastewater

Supply, conveyance, treatment, and distribution of water for the project require the use of electricity, which would result in associated indirect GHG emissions. Similarly, wastewater generated by the project would require the use of electricity for conveyance and treatment, along with GHG emissions generated during wastewater treatment. Water consumption estimates for both indoor and outdoor water use and associated electricity consumption from water use and wastewater generation were estimated using CalEEMod default values.

[14] The default CalEEMod weighted emission rates for gasoline vehicles have not been adjusted for Safer Affordable Fuel-Efficient Vehicles Rule; however, the redistribution of vehicle miles traveled between electric vehicles, gasoline vehicles, and diesel vehicles would cause a very small change in the weighted emission rates.

3.5 Impact Analysis

3.5.1 Threshold 1

Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Construction Emissions

Construction of the project would result in GHG emissions, which are primarily associated with the use of off-road construction equipment, on-road vendor trucks, and worker vehicles.

CalEEMod was used to calculate the annual GHG emissions based on the construction scenario described in Section 2.4.2.1. Construction of the project is anticipated to commence in July 2021 and reach completion in May 2022, lasting a total of 11 months. Table 10 presents construction emissions for the project in 2021 and 2022 from construction emission sources.

Table 10. Estimated Annual Construction Greenhouse Gas Emissions

	CO_2	CH_4	N_2O	CO_2e
Year	*Metric Tons*			
2021	167.69	0.03	0.00	168.33
2022	79.01	0.01	0.00	79.36
Total	**246.70**	**0.04**	**0.00**	**247.69**
30-year Amortized Construction Emissions (MT CO_2e per year)				**8.26**

Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent; MT = metric tons.
See Appendix A for complete results.
Totals may not add due to rounding.

As shown in Table 10, the estimated total GHG emissions during construction of would be approximately 248 MT CO_2e over the construction period (2021 and 2022). Estimated project-generated construction emissions amortized over 30 years would be approximately 8 MT CO_2e per year. As with project-generated construction criteria air pollutant emissions, GHG emissions generated during construction of the project would be short term in nature, lasting only for the duration of the construction period (11 months), and would not represent a long-term source of GHG emissions. Because there is no separate GHG threshold for construction, the evaluation of significance is discussed in the operational emissions analysis in the following text.

Operational Emissions

Operation of the project would generate GHG emissions through motor vehicle trips to and from the project site; landscape maintenance equipment operation; energy use (natural gas and generation of electricity consumed by the project); solid waste disposal; and generation of electricity associated with water supply, treatment, and distribution and wastewater treatment. CalEEMod was used to calculate the annual GHG emissions based on the operational assumptions described in Section 3.4.2.2, Operation.

The estimated operational (year 2023) project-generated GHG emissions from area sources, energy usage, motor vehicles, solid waste generation, and water usage and wastewater generation are shown in Table 11.

Table 11. Estimated Annual Operational Greenhouse Gas Emissions

Emission Source	CO_2	CH_4	N_2O	CO_2e
	metric tons per year			
Area	0.10	<0.01	0.00	0.10
Energy	13.05	<0.01	<0.01	13.11
Mobile	51.95	<0.01	0.00	52.02
Solid waste	0.75	0.04	0.00	1.85
Water supply and wastewater	2.53	<0.01	<0.01	2.67
Operational Emissions				69.75
30-Year Amortized Construction Emissions				*8.26*
Operation plus Amortized Construction Total				**78.01**

Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent; <0.01 = reported emissions are less than 0.01.
See Appendix A for complete results.
The values shown are the annual emissions for operational year 2023.
Totals may not add due to rounding.

As shown in Table 11, estimated annual project-generated GHG emissions would be approximately 70 MT CO_2e per year as a result of project operations only. Estimated annual project-generated operational emissions in 2023 plus amortized project construction emissions would be approximately 78 MT CO_2e per year. Thus, the project's estimated GHG emissions would not exceed the 900 MT CO_2e per year significance threshold and the project's GHG emissions would be **less than significant**.

Mitigation Measures

No mitigation is required.

Level of Significance After Mitigation

Impacts would be less than significant without mitigation.

3.5.2 Threshold 2

Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Consistency with the City of Solana Beach's Climate Action Plan

The City adopted a CAP in July 2017, with the aim of mitigating Citywide GHG emissions while meeting the goals of AB 32. The CAP includes emission reduction targets of 15% below baseline conditions (2010) by 2020 and 50% below baseline conditions by 2035 (City of Solana Beach 2017). The CAP was not prepared in accordance with the requirements within CEQA Guidelines Section 15183.5 and thus is not considered a qualified GHG emission reduction plan and cannot be used to tier from for CEQA. Additionally, the CAP does not direct private actions; it instead informs the development of City ordinances that the project is required to adhere to. The project would not

conflict with the goals, policies, and emission reduction targets set forth in the CAP, nor would the project impede the state's ability to achieve these reduction goals.

Consistency with SANDAG'S 2019 Federal Regional Transportation Plan

Regarding consistency with SANDAG's 2019 Federal RTP, the project would be developed to support the policy objectives of the RTP and SB 375.

Table 12 illustrates the project's consistency with applicable goals and policies of the 2019 Federal RTP (SANDAG 2019).

Table 12. 2019 Federal Regional Transportation Plan Consistency Analysis

Category	Policy Objective or Strategy	Consistency Analysis
Habitat and Open Space Preservation	Focus growth in areas that are already urbanized, allowing the region to set aside and restore more open space in our less developed areas.	*Consistent.* The project would not impact any open space.
Habitat and Open Space Preservation	Protect and restore our region's urban canyons, coastlines, beaches, and water resources.	*Consistent.* The project would not impact any open space.
Regional Economic Prosperity	Invest in transportation projects that provide access for all communities to a variety of jobs with competitive wages.	*Not Applicable.* The project would not impair the ability of SANDAG to invest in transportation projects available to all members of the community.
Regional Economic Prosperity	Build infrastructure that makes the movement of freight in our community more efficient and environmentally friendly.	*Not Applicable.* The project does not propose regional freight movement, nor would it impair SANDAG's ability to preserve and expand options for regional freight movement.
Environmental Stewardship	Make transportation investments that result in cleaner air, environmental protection, conservation, efficiency, and sustainable living.	*Consistent.* The project would promote walkability and alternative transportation by creating neighborhoods that are linked by a series of interconnected sidewalks that will connect residents to existing transit. Thus, the project would help reduce the local air quality and GHG emissions.
Environmental Stewardship	Support energy programs that promote sustainability.	*Not applicable.* The project would not impair the ability of SANDAG to support energy programs to promote sustainability.
Mobility Choices	Provide safe, secure, healthy, affordable, and convenient travel choices between the places where people live, work, and play.	*Not applicable.* The project would not impair the ability of SANDAG to provide additional transportation choices within the region.
Mobility Choices	Take advantage of new technologies to make the transportation system more efficient and environmentally friendly.	*Not applicable.* The project would not impair the ability of SANDAG to implement new technologies within the transportation system within the region.
Healthy and Complete Communities	Create great places for everyone to live, work, and play.	*Consistent*. The project would interconnect sidewalks which would provide residents the opportunity to access nearby neighborhoods.

Table 12. 2019 Federal Regional Transportation Plan Consistency Analysis

Category	Policy Objective or Strategy	Consistency Analysis
Healthy and Complete Communities	Connect communities through a variety of transportation choices that promote healthy lifestyles, including walking and biking.	*Not Applicable.* The project would not impair the ability for SANDAG to create additional transportation opportunities to promote a healthy lifestyle.
Healthy and Complete Communities	Increase the supply and variety of housing types – affordable for people of all ages and income levels in areas with frequent transit service and with access to a variety of services.	*Consistent.* The project would develop eight residential apartment units.
Sustainability	Focus Housing and job growth in urbanized areas where there is existing and planned transportation infrastructure, including transit.	*Consistent.* The project would be located near major urban and employment centers.
Sustainability	Protect the environment by preserving sensitive habitat, open space, and farmland.	*Consistent.* The project would not impact any open space.
Sustainability	Invest in a transportation network that gives people transportation options and reduces greenhouse gas emissions.	*Not Applicable.* The project would not impair the ability of SANDAG to invest in transportation projects available to all members of the community.
Sustainability	Address the housing needs of all economic segments of the population.	*Consistent.* The project would develop eight residential apartment units.
Sustainability	Implement the 2019 Federal RTP through incentives and collaboration.	*Not Applicable.* The project would not impair the ability of SANDAG to implement the Regional Transportation Plan through incentives and collaborations.

Source: SANDAG 2019.

As shown in Table 12, the project is consistent with applicable policy objectives and strategies from the 2019 Federal RTP.

Consistency with SB 32 and EO S-3-05

- **EO S-3-05.** This EO establishes the following goals: GHG emissions should be reduced to 2000 levels by 2010, to 1990 levels by 2020, and to 80% below 1990 levels by 2050.
- **SB 32.** This bill establishes for a statewide GHG emissions reduction target whereby CARB, in adopting rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emissions reductions, shall ensure that statewide GHG emissions are reduced to at least 40% below 1990 levels by December 31, 2030.

This section evaluates whether the GHG emissions trajectory after project completion would impede the attainment of the 2030 and 2050 GHG reduction goals identified in EOs B-30-15 and S-3-05.

To begin, CARB has expressed optimism with regard to both the 2030 and 2050 goals. It states in the First Update that "California is on track to meet the near-term 2020 GHG emissions limit and is well positioned to maintain and

continue reductions beyond 2020 as required by AB 32" (CARB 2014, p. ES2). With regard to the 2050 target for reducing GHG emissions to 80% below 1990 levels, the First Update states the following (CARB 2014, p. 34):

> This level of reduction is achievable in California. In fact, if California realizes the expected benefits of existing policy goals (such as 12,000 megawatts of renewable distributed generation by 2020, net zero energy homes after 2020, existing building retrofits under AB 758, and others) it could reduce emissions by 2030 to levels squarely in line with those needed in the developed world and to stay on track to reduce emissions to 80% below 1990 levels by 2050. Additional measures, including locally driven measures and those necessary to meet federal air quality standards in 2032, could lead to even greater emission reductions.

In other words, CARB believes that the state is on a trajectory to meet the 2030 and 2050 GHG reduction targets set forth in AB 32, EO B-30-15, and EO S-3-05. This is confirmed in the 2030 Scoping Plan, which states (CARB 2017, p. 7):

> The Proposed Plan builds upon the successful framework established by the Initial Scoping Plan and First Update, while also identifying new, technologically feasibility and cost-effective strategies to ensure that California meets its GHG reduction targets in a way that promotes and rewards innovation, continues to foster economic growth, and delivers improvements to the environment and public health, including in disadvantaged communities. The Proposed Plan is developed to be consistent with requirements set forth in AB 32, SB 32, and AB 197.

The project would not interfere with implementation of any of the above-described GHG reduction goals for 2030 or 2050 because the project would result in emissions less than the 900 MT CO_2e per year significance threshold. Therefore, the project would be consistent with SB 32 and EO S-3-05, and impacts related to GHG emissions would be **less than significant.**

Mitigation Measures

No mitigation is required.

Level of Significance After Mitigation

Impacts would be less than significant without mitigation.

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5 List of Preparers

Samantha Wang, Air Quality Specialist

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APPENDIX A

CalEEMod Output Files

Ida Ave Apartments Solana

San Diego County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	20.00	Space	0.18	8,000.00	0
Apartments Low Rise	8.00	Dwelling Unit	0.94	8,000.00	23

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2023
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	495.54	**CH4 Intensity (lb/MWhr)**	0.02	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Adjusted for 2023 RPS for SDG&E

Land Use - Applicant-provided project acres.

Construction Phase -

Grading - Onsite and offsite grading and site prep

Architectural Coating - PDF-AQ-1 use of low-VOC paints.

Vehicle Trips - Calculated based on LLG traffic report weekday trip rate.

Woodstoves - No wood burning stoves or natural gas fireplaces shall be constructed.

Area Coating - Applicant shall use low VOC paints.

Energy Use -

Water And Wastewater - CalEEMod default water and wastewater values used, assumed 100% aerobic.

Construction Off-road Equipment Mitigation - Implementation of dust control measures.

Trips and VMT - 8795 cy of soil export

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Residential_Exterior	250.00	50.00
tblArchitecturalCoating	EF_Residential_Interior	250.00	5.00
tblAreaCoating	Area_EF_Residential_Exterior	250	50
tblAreaCoating	Area_EF_Residential_Interior	250	5
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	26
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblFireplaces	FireplaceDayYear	82.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	NumberGas	4.40	0.00
tblFireplaces	NumberNoFireplace	0.80	8.00
tblFireplaces	NumberWood	2.80	0.00
tblGrading	AcresOfGrading	1.50	1.13

tblGrading	AcresOfGrading	1.00	1.13
tblGrading	MaterialExported	0.00	8,795.00
tblLandUse	LotAcreage	0.50	0.94
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.02
tblProjectCharacteristics	CO2IntensityFactor	720.49	495.54
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblTripsAndVMT	HaulingTripNumber	0.00	1,100.00
tblVehicleTrips	ST_TR	7.16	6.52
tblVehicleTrips	SU_TR	6.07	5.53
tblVehicleTrips	WD_TR	6.59	6.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWoodstoves	NumberCatalytic	0.40	0.00
tblWoodstoves	NumberNoncatalytic	0.40	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.1249	1.0632	0.8865	1.9300e-003	0.0311	0.0457	0.0768	0.0122	0.0440	0.0562	0.0000	167.6870	167.6870	0.0259	0.0000	168.3333
2022	0.0782	0.5116	0.5354	9.5000e-004	3.7600e-003	0.0240	0.0277	1.0100e-003	0.0231	0.0241	0.0000	79.0146	79.0146	0.0139	0.0000	79.3612
Maximum	**0.1249**	**1.0632**	**0.8865**	**1.9300e-003**	**0.0311**	**0.0457**	**0.0768**	**0.0122**	**0.0440**	**0.0562**	**0.0000**	**167.6870**	**167.6870**	**0.0259**	**0.0000**	**168.3333**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.1249	1.0632	0.8865	1.9300e-003	0.0192	0.0457	0.0648	6.9700e-003	0.0440	0.0510	0.0000	167.6868	167.6868	0.0259	0.0000	168.3331
2022	0.0782	0.5116	0.5354	9.5000e-004	2.9400e-003	0.0240	0.0269	8.1000e-004	0.0231	0.0239	0.0000	79.0145	79.0145	0.0139	0.0000	79.3611
Maximum	**0.1249**	**1.0632**	**0.8865**	**1.9300e-003**	**0.0192**	**0.0457**	**0.0648**	**6.9700e-003**	**0.0440**	**0.0510**	**0.0000**	**167.6868**	**167.6868**	**0.0259**	**0.0000**	**168.3331**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**36.56**	**0.00**	**12.20**	**40.97**	**0.00**	**6.73**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	7-1-2021	9-30-2021	0.6739	0.6739
2	10-1-2021	12-31-2021	0.5164	0.5164
3	1-1-2022	3-31-2022	0.4630	0.4630
4	4-1-2022	6-30-2022	0.1289	0.1289
		Highest	0.6739	0.6739

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0347	6.9000e-004	0.0596	0.0000		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004	0.0000	0.0974	0.0974	9.0000e-005	0.0000	0.0997
Energy	4.8000e-004	4.1400e-003	1.7600e-003	3.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004	0.0000	13.0531	13.0531	4.3000e-004	1.5000e-004	13.1098
Mobile	0.0127	0.0509	0.1548	5.6000e-004	0.0517	4.3000e-004	0.0521	0.0139	4.0000e-004	0.0143	0.0000	51.9527	51.9527	2.6000e-003	0.0000	52.0178
Waste						0.0000	0.0000		0.0000	0.0000	0.7470	0.0000	0.7470	0.0442	0.0000	1.8507
Water						0.0000	0.0000		0.0000	0.0000	0.1844	2.3461	2.5305	7.3000e-004	4.2000e-004	2.6739
Total	**0.0478**	**0.0557**	**0.2161**	**5.9000e-004**	**0.0517**	**1.0900e-003**	**0.0528**	**0.0139**	**1.0600e-003**	**0.0149**	**0.9314**	**67.4494**	**68.3808**	**0.0480**	**5.7000e-004**	**69.7520**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0347	6.9000e-004	0.0596	0.0000		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004	0.0000	0.0974	0.0974	9.0000e-005	0.0000	0.0997
Energy	4.8000e-004	4.1400e-003	1.7600e-003	3.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004	0.0000	13.0531	13.0531	4.3000e-004	1.5000e-004	13.1098
Mobile	0.0127	0.0509	0.1548	5.6000e-004	0.0517	4.3000e-004	0.0521	0.0139	4.0000e-004	0.0143	0.0000	51.9527	51.9527	2.6000e-003	0.0000	52.0178
Waste						0.0000	0.0000		0.0000	0.0000	0.7470	0.0000	0.7470	0.0442	0.0000	1.8507
Water						0.0000	0.0000		0.0000	0.0000	0.1844	2.3461	2.5305	7.3000e-004	4.2000e-004	2.6739
Total	**0.0478**	**0.0557**	**0.2161**	**5.9000e-004**	**0.0517**	**1.0900e-003**	**0.0528**	**0.0139**	**1.0600e-003**	**0.0149**	**0.9314**	**67.4494**	**68.3808**	**0.0480**	**5.7000e-004**	**69.7520**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**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**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	7/1/2021	7/2/2021	5	2	
2	Grading	Grading	7/3/2021	7/8/2021	5	4	
3	Building Construction	Building Construction	7/9/2021	4/14/2022	5	200	
4	Paving	Paving	4/15/2022	4/28/2022	5	10	
5	Architectural Coating	Architectural Coating	4/29/2022	5/12/2022	5	10	

Acres of Grading (Site Preparation Phase): 1.13

Acres of Grading (Grading Phase): 1.13

Acres of Paving: 0.18

Residential Indoor: 16,200; Residential Outdoor: 5,400; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 480 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	187	0.41
Grading	Rubber Tired Dozers	1	6.00	247	0.40
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Building Construction	Cranes	1	6.00	231	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	6.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	3	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	1,100.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	9.00	2.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	2.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.8700e-003	0.0000	5.8700e-003	2.9600e-003	0.0000	2.9600e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.5600e-003	0.0174	7.5600e-003	2.0000e-005		7.7000e-004	7.7000e-004		7.0000e-004	7.0000e-004	0.0000	1.5118	1.5118	4.9000e-004	0.0000	1.5241
Total	**1.5600e-003**	**0.0174**	**7.5600e-003**	**2.0000e-005**	**5.8700e-003**	**7.7000e-004**	**6.6400e-003**	**2.9600e-003**	**7.0000e-004**	**3.6600e-003**	**0.0000**	**1.5118**	**1.5118**	**4.9000e-004**	**0.0000**	**1.5241**

3.2 Site Preparation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	2.0000e-005	2.0000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0560	0.0560	0.0000	0.0000	0.0561
Total	**3.0000e-005**	**2.0000e-005**	**2.0000e-004**	**0.0000**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0560**	**0.0560**	**0.0000**	**0.0000**	**0.0561**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.6400e-003	0.0000	2.6400e-003	1.3300e-003	0.0000	1.3300e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.5600e-003	0.0174	7.5600e-003	2.0000e-005		7.7000e-004	7.7000e-004		7.0000e-004	7.0000e-004	0.0000	1.5118	1.5118	4.9000e-004	0.0000	1.5241
Total	**1.5600e-003**	**0.0174**	**7.5600e-003**	**2.0000e-005**	**2.6400e-003**	**7.7000e-004**	**3.4100e-003**	**1.3300e-003**	**7.0000e-004**	**2.0300e-003**	**0.0000**	**1.5118**	**1.5118**	**4.9000e-004**	**0.0000**	**1.5241**

3.2 Site Preparation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	2.0000e-005	2.0000e-004	0.0000	5.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0560	0.0560	0.0000	0.0000	0.0561
Total	**3.0000e-005**	**2.0000e-005**	**2.0000e-004**	**0.0000**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0560**	**0.0560**	**0.0000**	**0.0000**	**0.0561**

3.3 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0103	0.0000	0.0103	5.1200e-003	0.0000	5.1200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.5800e-003	0.0287	0.0127	3.0000e-005		1.2800e-003	1.2800e-003		1.1700e-003	1.1700e-003	0.0000	2.4767	2.4767	8.0000e-004	0.0000	2.4968
Total	**2.5800e-003**	**0.0287**	**0.0127**	**3.0000e-005**	**0.0103**	**1.2800e-003**	**0.0115**	**5.1200e-003**	**1.1700e-003**	**6.2900e-003**	**0.0000**	**2.4767**	**2.4767**	**8.0000e-004**	**0.0000**	**2.4968**

3.3 Grading - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.1300e-003	0.1436	0.0354	4.2000e-004	9.4100e-003	4.3000e-004	9.8500e-003	2.5800e-003	4.2000e-004	3.0000e-003	0.0000	41.8892	41.8892	3.7800e-003	0.0000	41.9837
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.0000e-005	4.0000e-005	4.0000e-004	0.0000	1.3000e-004	0.0000	1.3000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1121	0.1121	0.0000	0.0000	0.1122
Total	**4.1900e-003**	**0.1437**	**0.0358**	**4.2000e-004**	**9.5400e-003**	**4.3000e-004**	**9.9800e-003**	**2.6100e-003**	**4.2000e-004**	**3.0300e-003**	**0.0000**	**42.0012**	**42.0012**	**3.7800e-003**	**0.0000**	**42.0958**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.6100e-003	0.0000	4.6100e-003	2.3100e-003	0.0000	2.3100e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.5800e-003	0.0287	0.0127	3.0000e-005		1.2800e-003	1.2800e-003		1.1700e-003	1.1700e-003	0.0000	2.4767	2.4767	8.0000e-004	0.0000	2.4968
Total	**2.5800e-003**	**0.0287**	**0.0127**	**3.0000e-005**	**4.6100e-003**	**1.2800e-003**	**5.8900e-003**	**2.3100e-003**	**1.1700e-003**	**3.4800e-003**	**0.0000**	**2.4767**	**2.4767**	**8.0000e-004**	**0.0000**	**2.4968**

3.3 Grading - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.1300e-003	0.1436	0.0354	4.2000e-004	7.5700e-003	4.3000e-004	8.0100e-003	2.1300e-003	4.2000e-004	2.5500e-003	0.0000	41.8892	41.8892	3.7800e-003	0.0000	41.9837
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.0000e-005	4.0000e-005	4.0000e-004	0.0000	1.0000e-004	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1121	0.1121	0.0000	0.0000	0.1122
Total	**4.1900e-003**	**0.1437**	**0.0358**	**4.2000e-004**	**7.6700e-003**	**4.3000e-004**	**8.1100e-003**	**2.1600e-003**	**4.2000e-004**	**2.5800e-003**	**0.0000**	**42.0012**	**42.0012**	**3.7800e-003**	**0.0000**	**42.0958**

3.4 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1142	0.8591	0.8127	1.3900e-003		0.0431	0.0431		0.0416	0.0416	0.0000	114.3750	114.3750	0.0204	0.0000	114.8855
Total	**0.1142**	**0.8591**	**0.8127**	**1.3900e-003**		**0.0431**	**0.0431**		**0.0416**	**0.0416**	**0.0000**	**114.3750**	**114.3750**	**0.0204**	**0.0000**	**114.8855**

3.4 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.9000e-004	0.0130	3.4500e-003	3.0000e-005	8.4000e-004	3.0000e-005	8.6000e-004	2.4000e-004	3.0000e-005	2.7000e-004	0.0000	3.2941	3.2941	2.4000e-004	0.0000	3.3003
Worker	1.9700e-003	1.4100e-003	0.0142	4.0000e-005	4.5500e-003	3.0000e-005	4.5800e-003	1.2100e-003	3.0000e-005	1.2400e-003	0.0000	3.9720	3.9720	1.1000e-004	0.0000	3.9748
Total	**2.3600e-003**	**0.0144**	**0.0176**	**7.0000e-005**	**5.3900e-003**	**6.0000e-005**	**5.4400e-003**	**1.4500e-003**	**6.0000e-005**	**1.5100e-003**	**0.0000**	**7.2661**	**7.2661**	**3.5000e-004**	**0.0000**	**7.2751**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1142	0.8591	0.8127	1.3900e-003		0.0431	0.0431		0.0416	0.0416	0.0000	114.3749	114.3749	0.0204	0.0000	114.8853
Total	**0.1142**	**0.8591**	**0.8127**	**1.3900e-003**		**0.0431**	**0.0431**		**0.0416**	**0.0416**	**0.0000**	**114.3749**	**114.3749**	**0.0204**	**0.0000**	**114.8853**

3.4 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.9000e-004	0.0130	3.4500e-003	3.0000e-005	6.8000e-004	3.0000e-005	7.1000e-004	2.0000e-004	3.0000e-005	2.3000e-004	0.0000	3.2941	3.2941	2.4000e-004	0.0000	3.3003
Worker	1.9700e-003	1.4100e-003	0.0142	4.0000e-005	3.5200e-003	3.0000e-005	3.5600e-003	9.6000e-004	3.0000e-005	9.9000e-004	0.0000	3.9720	3.9720	1.1000e-004	0.0000	3.9748
Total	**2.3600e-003**	**0.0144**	**0.0176**	**7.0000e-005**	**4.2000e-003**	**6.0000e-005**	**4.2700e-003**	**1.1600e-003**	**6.0000e-005**	**1.2200e-003**	**0.0000**	**7.2661**	**7.2661**	**3.5000e-004**	**0.0000**	**7.2751**

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0610	0.4626	0.4709	8.2000e-004		0.0218	0.0218		0.0211	0.0211	0.0000	67.1835	67.1835	0.0117	0.0000	67.4760
Total	**0.0610**	**0.4626**	**0.4709**	**8.2000e-004**		**0.0218**	**0.0218**		**0.0211**	**0.0211**	**0.0000**	**67.1835**	**67.1835**	**0.0117**	**0.0000**	**67.4760**

3.4 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.1000e-004	7.1800e-003	1.9200e-003	2.0000e-005	4.9000e-004	1.0000e-005	5.1000e-004	1.4000e-004	1.0000e-005	1.6000e-004	0.0000	1.9163	1.9163	1.4000e-004	0.0000	1.9198
Worker	1.1000e-003	7.5000e-004	7.7200e-003	2.0000e-005	2.6700e-003	2.0000e-005	2.6900e-003	7.1000e-004	2.0000e-005	7.3000e-004	0.0000	2.2472	2.2472	6.0000e-005	0.0000	2.2488
Total	**1.3100e-003**	**7.9300e-003**	**9.6400e-003**	**4.0000e-005**	**3.1600e-003**	**3.0000e-005**	**3.2000e-003**	**8.5000e-004**	**3.0000e-005**	**8.9000e-004**	**0.0000**	**4.1636**	**4.1636**	**2.0000e-004**	**0.0000**	**4.1686**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0610	0.4626	0.4709	8.2000e-004		0.0218	0.0218		0.0211	0.0211	0.0000	67.1834	67.1834	0.0117	0.0000	67.4759
Total	**0.0610**	**0.4626**	**0.4709**	**8.2000e-004**		**0.0218**	**0.0218**		**0.0211**	**0.0211**	**0.0000**	**67.1834**	**67.1834**	**0.0117**	**0.0000**	**67.4759**

3.4 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.1000e-004	7.1800e-003	1.9200e-003	2.0000e-005	4.0000e-004	1.0000e-005	4.1000e-004	1.2000e-004	1.0000e-005	1.3000e-004	0.0000	1.9163	1.9163	1.4000e-004	0.0000	1.9198
Worker	1.1000e-003	7.5000e-004	7.7200e-003	2.0000e-005	2.0700e-003	2.0000e-005	2.0900e-003	5.6000e-004	2.0000e-005	5.8000e-004	0.0000	2.2472	2.2472	6.0000e-005	0.0000	2.2488
Total	**1.3100e-003**	**7.9300e-003**	**9.6400e-003**	**4.0000e-005**	**2.4700e-003**	**3.0000e-005**	**2.5000e-003**	**6.8000e-004**	**3.0000e-005**	**7.1000e-004**	**0.0000**	**4.1636**	**4.1636**	**2.0000e-004**	**0.0000**	**4.1686**

3.5 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.4400e-003	0.0339	0.0440	7.0000e-005		1.7400e-003	1.7400e-003		1.6000e-003	1.6000e-003	0.0000	5.8848	5.8848	1.8700e-003	0.0000	5.9315
Paving	2.4000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.6800e-003**	**0.0339**	**0.0440**	**7.0000e-005**		**1.7400e-003**	**1.7400e-003**		**1.6000e-003**	**1.6000e-003**	**0.0000**	**5.8848**	**5.8848**	**1.8700e-003**	**0.0000**	**5.9315**

3.5 Paving - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.1000e-004	1.5000e-004	1.5100e-003	0.0000	5.2000e-004	0.0000	5.2000e-004	1.4000e-004	0.0000	1.4000e-004	0.0000	0.4387	0.4387	1.0000e-005	0.0000	0.4390
Total	**2.1000e-004**	**1.5000e-004**	**1.5100e-003**	**0.0000**	**5.2000e-004**	**0.0000**	**5.2000e-004**	**1.4000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**0.4387**	**0.4387**	**1.0000e-005**	**0.0000**	**0.4390**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.4400e-003	0.0339	0.0440	7.0000e-005		1.7400e-003	1.7400e-003		1.6000e-003	1.6000e-003	0.0000	5.8848	5.8848	1.8700e-003	0.0000	5.9314
Paving	2.4000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.6800e-003**	**0.0339**	**0.0440**	**7.0000e-005**		**1.7400e-003**	**1.7400e-003**		**1.6000e-003**	**1.6000e-003**	**0.0000**	**5.8848**	**5.8848**	**1.8700e-003**	**0.0000**	**5.9314**

3.5 Paving - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.1000e-004	1.5000e-004	1.5100e-003	0.0000	4.0000e-004	0.0000	4.1000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.4387	0.4387	1.0000e-005	0.0000	0.4390
Total	**2.1000e-004**	**1.5000e-004**	**1.5100e-003**	**0.0000**	**4.0000e-004**	**0.0000**	**4.1000e-004**	**1.1000e-004**	**0.0000**	**1.1000e-004**	**0.0000**	**0.4387**	**0.4387**	**1.0000e-005**	**0.0000**	**0.4390**

3.6 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0109					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0200e-003	7.0400e-003	9.0700e-003	1.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	1.2766	1.2766	8.0000e-005	0.0000	1.2787
Total	**0.0119**	**7.0400e-003**	**9.0700e-003**	**1.0000e-005**		**4.1000e-004**	**4.1000e-004**		**4.1000e-004**	**4.1000e-004**	**0.0000**	**1.2766**	**1.2766**	**8.0000e-005**	**0.0000**	**1.2787**

3.6 Architectural Coating - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	2.0000e-005	2.3000e-004	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0675	0.0675	0.0000	0.0000	0.0675
Total	**3.0000e-005**	**2.0000e-005**	**2.3000e-004**	**0.0000**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0675**	**0.0675**	**0.0000**	**0.0000**	**0.0675**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0109					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0200e-003	7.0400e-003	9.0700e-003	1.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	1.2766	1.2766	8.0000e-005	0.0000	1.2787
Total	**0.0119**	**7.0400e-003**	**9.0700e-003**	**1.0000e-005**		**4.1000e-004**	**4.1000e-004**		**4.1000e-004**	**4.1000e-004**	**0.0000**	**1.2766**	**1.2766**	**8.0000e-005**	**0.0000**	**1.2787**

3.6 Architectural Coating - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	2.0000e-005	2.3000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0675	0.0675	0.0000	0.0000	0.0675
Total	**3.0000e-005**	**2.0000e-005**	**2.3000e-004**	**0.0000**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0675**	**0.0675**	**0.0000**	**0.0000**	**0.0675**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0127	0.0509	0.1548	5.6000e-004	0.0517	4.3000e-004	0.0521	0.0139	4.0000e-004	0.0143	0.0000	51.9527	51.9527	2.6000e-003	0.0000	52.0178
Unmitigated	0.0127	0.0509	0.1548	5.6000e-004	0.0517	4.3000e-004	0.0521	0.0139	4.0000e-004	0.0143	0.0000	51.9527	51.9527	2.6000e-003	0.0000	52.0178

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	48.00	52.16	44.24	137,218	137,218
Parking Lot	0.00	0.00	0.00		
Total	48.00	52.16	44.24	137,218	137,218

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	10.80	7.30	7.50	41.60	18.80	39.60	86	11	3
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.602700	0.040134	0.179939	0.104242	0.014985	0.005435	0.016642	0.024350	0.001934	0.001888	0.005938	0.000757	0.001056
Parking Lot	0.602700	0.040134	0.179939	0.104242	0.014985	0.005435	0.016642	0.024350	0.001934	0.001888	0.005938	0.000757	0.001056

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	8.2608	8.2608	3.3000e-004	7.0000e-005	8.2890
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	8.2608	8.2608	3.3000e-004	7.0000e-005	8.2890
NaturalGas Mitigated	4.8000e-004	4.1400e-003	1.7600e-003	3.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004	0.0000	4.7923	4.7923	9.0000e-005	9.0000e-005	4.8208
NaturalGas Unmitigated	4.8000e-004	4.1400e-003	1.7600e-003	3.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004	0.0000	4.7923	4.7923	9.0000e-005	9.0000e-005	4.8208

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	89803.9	4.8000e-004	4.1400e-003	1.7600e-003	3.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004	0.0000	4.7923	4.7923	9.0000e-005	9.0000e-005	4.8208
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**4.8000e-004**	**4.1400e-003**	**1.7600e-003**	**3.0000e-005**		**3.3000e-004**	**3.3000e-004**		**3.3000e-004**	**3.3000e-004**	**0.0000**	**4.7923**	**4.7923**	**9.0000e-005**	**9.0000e-005**	**4.8208**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	89803.9	4.8000e-004	4.1400e-003	1.7600e-003	3.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004	0.0000	4.7923	4.7923	9.0000e-005	9.0000e-005	4.8208
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**4.8000e-004**	**4.1400e-003**	**1.7600e-003**	**3.0000e-005**		**3.3000e-004**	**3.3000e-004**		**3.3000e-004**	**3.3000e-004**	**0.0000**	**4.7923**	**4.7923**	**9.0000e-005**	**9.0000e-005**	**4.8208**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	33951.8	7.6315	3.1000e-004	6.0000e-005	7.6575
Parking Lot	2800	0.6294	3.0000e-005	1.0000e-005	0.6315
Total		**8.2608**	**3.4000e-004**	**7.0000e-005**	**8.2890**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	33951.8	7.6315	3.1000e-004	6.0000e-005	7.6575
Parking Lot	2800	0.6294	3.0000e-005	1.0000e-005	0.6315
Total		**8.2608**	**3.4000e-004**	**7.0000e-005**	**8.2890**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0347	6.9000e-004	0.0596	0.0000		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004	0.0000	0.0974	0.0974	9.0000e-005	0.0000	0.0997
Unmitigated	0.0347	6.9000e-004	0.0596	0.0000		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004	0.0000	0.0974	0.0974	9.0000e-005	0.0000	0.0997

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.0900e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0318					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.8100e-003	6.9000e-004	0.0596	0.0000		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004	0.0000	0.0974	0.0974	9.0000e-005	0.0000	0.0997
Total	**0.0347**	**6.9000e-004**	**0.0596**	**0.0000**		**3.3000e-004**	**3.3000e-004**		**3.3000e-004**	**3.3000e-004**	**0.0000**	**0.0974**	**0.0974**	**9.0000e-005**	**0.0000**	**0.0997**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.0900e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0318					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.8100e-003	6.9000e-004	0.0596	0.0000		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004	0.0000	0.0974	0.0974	9.0000e-005	0.0000	0.0997
Total	**0.0347**	**6.9000e-004**	**0.0596**	**0.0000**		**3.3000e-004**	**3.3000e-004**		**3.3000e-004**	**3.3000e-004**	**0.0000**	**0.0974**	**0.0974**	**9.0000e-005**	**0.0000**	**0.0997**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	2.5305	7.3000e-004	4.2000e-004	2.6739
Unmitigated	2.5305	7.3000e-004	4.2000e-004	2.6739

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	0.521232 / 0.328603	2.5305	7.3000e-004	4.2000e-004	2.6739
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**2.5305**	**7.3000e-004**	**4.2000e-004**	**2.6739**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	0.521232 / 0.328603	2.5305	7.3000e-004	4.2000e-004	2.6739
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**2.5305**	**7.3000e-004**	**4.2000e-004**	**2.6739**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.7470	0.0442	0.0000	1.8507
Unmitigated	0.7470	0.0442	0.0000	1.8507

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	3.68	0.7470	0.0442	0.0000	1.8507
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**0.7470**	**0.0442**	**0.0000**	**1.8507**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	3.68	0.7470	0.0442	0.0000	1.8507
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**0.7470**	**0.0442**	**0.0000**	**1.8507**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Ida Ave Apartments Solana

San Diego County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	20.00	Space	0.18	8,000.00	0
Apartments Low Rise	8.00	Dwelling Unit	0.94	8,000.00	23

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2023
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	495.54	**CH4 Intensity (lb/MWhr)**	0.02	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Ida Ave Apartments Solana - San Diego County, Summer

Project Characteristics - Adjusted for 2023 RPS for SDG&E

Land Use - Applicant-provided project acres.

Construction Phase -

Grading - Onsite and offsite grading and site prep

Architectural Coating - PDF-AQ-1 use of low-VOC paints.

Vehicle Trips - Calculated based on LLG traffic report weekday trip rate.

Woodstoves - No wood burning stoves or natural gas fireplaces shall be constructed.

Area Coating - Applicant shall use low VOC paints.

Energy Use -

Water And Wastewater - CalEEMod default water and wastewater values used, assumed 100% aerobic.

Construction Off-road Equipment Mitigation - Implementation of dust control measures.

Trips and VMT - 8795 cy of soil export

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Residential_Exterior	250.00	50.00
tblArchitecturalCoating	EF_Residential_Interior	250.00	5.00
tblAreaCoating	Area_EF_Residential_Exterior	250	50
tblAreaCoating	Area_EF_Residential_Interior	250	5
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	26
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblFireplaces	FireplaceDayYear	82.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	NumberGas	4.40	0.00
tblFireplaces	NumberNoFireplace	0.80	8.00
tblFireplaces	NumberWood	2.80	0.00
tblGrading	AcresOfGrading	1.50	1.13

tblGrading	AcresOfGrading	1.00	1.13
tblGrading	MaterialExported	0.00	8,795.00
tblLandUse	LotAcreage	0.50	0.94
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.02
tblProjectCharacteristics	CO2IntensityFactor	720.49	495.54
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblTripsAndVMT	HaulingTripNumber	0.00	1,100.00
tblVehicleTrips	ST_TR	7.16	6.52
tblVehicleTrips	SU_TR	6.07	5.53
tblVehicleTrips	WD_TR	6.59	6.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWoodstoves	NumberCatalytic	0.40	0.00
tblWoodstoves	NumberNoncatalytic	0.40	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	3.3573	84.8403	23.7889	0.2268	9.9961	0.8535	10.8496	3.8962	0.7931	4.6892	0.0000	24,686.4280	24,686.4280	2.4977	0.0000	24,748.8702
2022	2.3942	12.7140	12.9976	0.0233	0.1068	0.5897	0.6772	0.0283	0.5697	0.5932	0.0000	2,129.8760	2,129.8760	0.4141	0.0000	2,138.7400
Maximum	**3.3573**	**84.8403**	**23.7889**	**0.2268**	**9.9961**	**0.8535**	**10.8496**	**3.8962**	**0.7931**	**4.6892**	**0.0000**	**24,686.4280**	**24,686.4280**	**2.4977**	**0.0000**	**24,748.8702**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	3.3573	84.8403	23.7889	0.2268	6.2171	0.8535	7.0706	2.2515	0.7931	3.0446	0.0000	24,686.4280	24,686.4280	2.4977	0.0000	24,748.8702
2022	2.3942	12.7140	12.9976	0.0233	0.0827	0.5897	0.6580	0.0224	0.5697	0.5885	0.0000	2,129.8760	2,129.8760	0.4141	0.0000	2,138.7400
Maximum	**3.3573**	**84.8403**	**23.7889**	**0.2268**	**6.2171**	**0.8535**	**7.0706**	**2.2515**	**0.7931**	**3.0446**	**0.0000**	**24,686.4280**	**24,686.4280**	**2.4977**	**0.0000**	**24,748.8702**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**37.64**	**0.00**	**32.95**	**42.06**	**0.00**	**31.22**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.2001	7.6300e-003	0.6622	4.0000e-005		3.6600e-003	3.6600e-003		3.6600e-003	3.6600e-003	0.0000	1.1928	1.1928	1.1500e-003	0.0000	1.2217
Energy	2.6500e-003	0.0227	9.6500e-003	1.4000e-004		1.8300e-003	1.8300e-003		1.8300e-003	1.8300e-003		28.9457	28.9457	5.5000e-004	5.3000e-004	29.1177
Mobile	0.0799	0.2939	0.9531	3.5000e-003	0.3158	2.5900e-003	0.3184	0.0844	2.4100e-003	0.0868		356.5705	356.5705	0.0173		357.0017
Total	**0.2827**	**0.3242**	**1.6249**	**3.6800e-003**	**0.3158**	**8.0800e-003**	**0.3239**	**0.0844**	**7.9000e-003**	**0.0923**	**0.0000**	**386.7089**	**386.7089**	**0.0190**	**5.3000e-004**	**387.3410**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.2001	7.6300e-003	0.6622	4.0000e-005		3.6600e-003	3.6600e-003		3.6600e-003	3.6600e-003	0.0000	1.1928	1.1928	1.1500e-003	0.0000	1.2217
Energy	2.6500e-003	0.0227	9.6500e-003	1.4000e-004		1.8300e-003	1.8300e-003		1.8300e-003	1.8300e-003		28.9457	28.9457	5.5000e-004	5.3000e-004	29.1177
Mobile	0.0799	0.2939	0.9531	3.5000e-003	0.3158	2.5900e-003	0.3184	0.0844	2.4100e-003	0.0868		356.5705	356.5705	0.0173		357.0017
Total	**0.2827**	**0.3242**	**1.6249**	**3.6800e-003**	**0.3158**	**8.0800e-003**	**0.3239**	**0.0844**	**7.9000e-003**	**0.0923**	**0.0000**	**386.7089**	**386.7089**	**0.0190**	**5.3000e-004**	**387.3410**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**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**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	7/1/2021	7/2/2021	5	2	
2	Grading	Grading	7/3/2021	7/8/2021	5	4	
3	Building Construction	Building Construction	7/9/2021	4/14/2022	5	200	
4	Paving	Paving	4/15/2022	4/28/2022	5	10	
5	Architectural Coating	Architectural Coating	4/29/2022	5/12/2022	5	10	

Acres of Grading (Site Preparation Phase): 1.13

Acres of Grading (Grading Phase): 1.13

Acres of Paving: 0.18

Residential Indoor: 16,200; Residential Outdoor: 5,400; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 480 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	187	0.41
Grading	Rubber Tired Dozers	1	6.00	247	0.40
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Building Construction	Cranes	1	6.00	231	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	6.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	3	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	1,100.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	9.00	2.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	2.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.8685	0.0000	5.8685	2.9612	0.0000	2.9612			0.0000			0.0000
Off-Road	1.5558	17.4203	7.5605	0.0172		0.7654	0.7654		0.7041	0.7041		1,666.5174	1,666.5174	0.5390		1,679.9920
Total	**1.5558**	**17.4203**	**7.5605**	**0.0172**	**5.8685**	**0.7654**	**6.6339**	**2.9612**	**0.7041**	**3.6653**		**1,666.5174**	**1,666.5174**	**0.5390**		**1,679.9920**

3.2 Site Preparation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0277	0.0180	0.2122	6.5000e-004	0.0657	4.5000e-004	0.0662	0.0174	4.2000e-004	0.0179		65.1553	65.1553	1.8600e-003		65.2018
Total	**0.0277**	**0.0180**	**0.2122**	**6.5000e-004**	**0.0657**	**4.5000e-004**	**0.0662**	**0.0174**	**4.2000e-004**	**0.0179**		**65.1553**	**65.1553**	**1.8600e-003**		**65.2018**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.6408	0.0000	2.6408	1.3325	0.0000	1.3325			0.0000			0.0000
Off-Road	1.5558	17.4203	7.5605	0.0172		0.7654	0.7654		0.7041	0.7041	0.0000	1,666.5174	1,666.5174	0.5390		1,679.9920
Total	**1.5558**	**17.4203**	**7.5605**	**0.0172**	**2.6408**	**0.7654**	**3.4062**	**1.3325**	**0.7041**	**2.0367**	**0.0000**	**1,666.5174**	**1,666.5174**	**0.5390**		**1,679.9920**

3.2 Site Preparation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0277	0.0180	0.2122	6.5000e-004	0.0509	4.5000e-004	0.0513	0.0138	4.2000e-004	0.0142		65.1553	65.1553	1.8600e-003		65.2018
Total	**0.0277**	**0.0180**	**0.2122**	**6.5000e-004**	**0.0509**	**4.5000e-004**	**0.0513**	**0.0138**	**4.2000e-004**	**0.0142**		**65.1553**	**65.1553**	**1.8600e-003**		**65.2018**

3.3 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.1251	0.0000	5.1251	2.5618	0.0000	2.5618			0.0000			0.0000
Off-Road	1.2884	14.3307	6.3314	0.0141		0.6379	0.6379		0.5869	0.5869		1,365.0648	1,365.0648	0.4415		1,376.1020
Total	**1.2884**	**14.3307**	**6.3314**	**0.0141**	**5.1251**	**0.6379**	**5.7630**	**2.5618**	**0.5869**	**3.1487**		**1,365.0648**	**1,365.0648**	**0.4415**		**1,376.1020**

3.3 Grading - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.0413	70.4915	17.2453	0.2121	4.8053	0.2151	5.0204	1.3169	0.2058	1.5227		23,256.2079	23,256.2079	2.0543		23,307.5664
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0277	0.0180	0.2122	6.5000e-004	0.0657	4.5000e-004	0.0662	0.0174	4.2000e-004	0.0179		65.1553	65.1553	1.8600e-003		65.2018
Total	**2.0690**	**70.5095**	**17.4575**	**0.2127**	**4.8710**	**0.2155**	**5.0865**	**1.3343**	**0.2062**	**1.5405**		**23,321.3632**	**23,321.3632**	**2.0562**		**23,372.7681**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.3063	0.0000	2.3063	1.1528	0.0000	1.1528			0.0000			0.0000
Off-Road	1.2884	14.3307	6.3314	0.0141		0.6379	0.6379		0.5869	0.5869	0.0000	1,365.0648	1,365.0648	0.4415		1,376.1020
Total	**1.2884**	**14.3307**	**6.3314**	**0.0141**	**2.3063**	**0.6379**	**2.9442**	**1.1528**	**0.5869**	**1.7397**	**0.0000**	**1,365.0648**	**1,365.0648**	**0.4415**		**1,376.1020**

3.3 Grading - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.0413	70.4915	17.2453	0.2121	3.8600	0.2151	4.0750	1.0849	0.2058	1.2907		23,256.2079	23,256.2079	2.0543		23,307.5664
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0277	0.0180	0.2122	6.5000e-004	0.0509	4.5000e-004	0.0513	0.0138	4.2000e-004	0.0142		65.1553	65.1553	1.8600e-003		65.2018
Total	**2.0690**	**70.5095**	**17.4575**	**0.2127**	**3.9108**	**0.2155**	**4.1264**	**1.0987**	**0.2062**	**1.3049**		**23,321.3632**	**23,321.3632**	**2.0562**		**23,372.7681**

3.4 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8125	13.6361	12.8994	0.0221		0.6843	0.6843		0.6608	0.6608		2,001.2200	2,001.2200	0.3573		2,010.1517
Total	**1.8125**	**13.6361**	**12.8994**	**0.0221**		**0.6843**	**0.6843**		**0.6608**	**0.6608**		**2,001.2200**	**2,001.2200**	**0.3573**		**2,010.1517**

3.4 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	6.0500e-003	0.2037	0.0519	5.4000e-004	0.0135	4.3000e-004	0.0140	3.9000e-003	4.1000e-004	4.3100e-003		58.2704	58.2704	4.1600e-003		58.3745
Worker	0.0311	0.0202	0.2387	7.4000e-004	0.0739	5.1000e-004	0.0744	0.0196	4.7000e-004	0.0201		73.2997	73.2997	2.0900e-003		73.3520
Total	**0.0372**	**0.2239**	**0.2906**	**1.2800e-003**	**0.0875**	**9.4000e-004**	**0.0884**	**0.0235**	**8.8000e-004**	**0.0244**		**131.5701**	**131.5701**	**6.2500e-003**		**131.7265**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8125	13.6361	12.8994	0.0221		0.6843	0.6843		0.6608	0.6608	0.0000	2,001.2200	2,001.2200	0.3573		2,010.1517
Total	**1.8125**	**13.6361**	**12.8994**	**0.0221**		**0.6843**	**0.6843**		**0.6608**	**0.6608**	**0.0000**	**2,001.2200**	**2,001.2200**	**0.3573**		**2,010.1517**

3.4 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	6.0500e-003	0.2037	0.0519	5.4000e-004	0.0110	4.3000e-004	0.0115	3.2800e-003	4.1000e-004	3.6900e-003		58.2704	58.2704	4.1600e-003		58.3745
Worker	0.0311	0.0202	0.2387	7.4000e-004	0.0572	5.1000e-004	0.0577	0.0155	4.7000e-004	0.0160		73.2997	73.2997	2.0900e-003		73.3520
Total	**0.0372**	**0.2239**	**0.2906**	**1.2800e-003**	**0.0683**	**9.4000e-004**	**0.0692**	**0.0188**	**8.8000e-004**	**0.0197**		**131.5701**	**131.5701**	**6.2500e-003**		**131.7265**

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6487	12.5031	12.7264	0.0221		0.5889	0.5889		0.5689	0.5689		2,001.5429	2,001.5429	0.3486		2,010.2581
Total	**1.6487**	**12.5031**	**12.7264**	**0.0221**		**0.5889**	**0.5889**		**0.5689**	**0.5689**		**2,001.5429**	**2,001.5429**	**0.3486**		**2,010.2581**

3.4 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.6200e-003	0.1925	0.0492	5.4000e-004	0.0135	3.7000e-004	0.0139	3.9000e-003	3.5000e-004	4.2500e-003		57.7228	57.7228	4.0400e-003		57.8237
Worker	0.0294	0.0184	0.2220	7.1000e-004	0.0739	5.0000e-004	0.0744	0.0196	4.6000e-004	0.0201		70.6104	70.6104	1.9200e-003		70.6583
Total	**0.0351**	**0.2109**	**0.2711**	**1.2500e-003**	**0.0875**	**8.7000e-004**	**0.0883**	**0.0235**	**8.1000e-004**	**0.0243**		**128.3331**	**128.3331**	**5.9600e-003**		**128.4820**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6487	12.5031	12.7264	0.0221		0.5889	0.5889		0.5689	0.5689	0.0000	2,001.5429	2,001.5429	0.3486		2,010.2581
Total	**1.6487**	**12.5031**	**12.7264**	**0.0221**		**0.5889**	**0.5889**		**0.5689**	**0.5689**	**0.0000**	**2,001.5429**	**2,001.5429**	**0.3486**		**2,010.2581**

3.4 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.6200e-003	0.1925	0.0492	5.4000e-004	0.0110	3.7000e-004	0.0114	3.2800e-003	3.5000e-004	3.6300e-003		57.7228	57.7228	4.0400e-003		57.8237
Worker	0.0294	0.0184	0.2220	7.1000e-004	0.0572	5.0000e-004	0.0577	0.0155	4.6000e-004	0.0160		70.6104	70.6104	1.9200e-003		70.6583
Total	**0.0351**	**0.2109**	**0.2711**	**1.2500e-003**	**0.0683**	**8.7000e-004**	**0.0691**	**0.0188**	**8.1000e-004**	**0.0196**		**128.3331**	**128.3331**	**5.9600e-003**		**128.4820**

3.5 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6877	6.7738	8.8060	0.0135		0.3474	0.3474		0.3205	0.3205		1,297.3789	1,297.3789	0.4113		1,307.6608
Paving	0.0472					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7348**	**6.7738**	**8.8060**	**0.0135**		**0.3474**	**0.3474**		**0.3205**	**0.3205**		**1,297.3789**	**1,297.3789**	**0.4113**		**1,307.6608**

3.5 Paving - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0425	0.0266	0.3206	1.0200e-003	0.1068	7.2000e-004	0.1075	0.0283	6.6000e-004	0.0290		101.9928	101.9928	2.7700e-003		102.0620
Total	**0.0425**	**0.0266**	**0.3206**	**1.0200e-003**	**0.1068**	**7.2000e-004**	**0.1075**	**0.0283**	**6.6000e-004**	**0.0290**		**101.9928**	**101.9928**	**2.7700e-003**		**102.0620**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6877	6.7738	8.8060	0.0135		0.3474	0.3474		0.3205	0.3205	0.0000	1,297.3789	1,297.3789	0.4113		1,307.6608
Paving	0.0472					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7348**	**6.7738**	**8.8060**	**0.0135**		**0.3474**	**0.3474**		**0.3205**	**0.3205**	**0.0000**	**1,297.3789**	**1,297.3789**	**0.4113**		**1,307.6608**

3.5 Paving - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0425	0.0266	0.3206	1.0200e-003	0.0827	7.2000e-004	0.0834	0.0224	6.6000e-004	0.0231		101.9928	101.9928	2.7700e-003		102.0620
Total	**0.0425**	**0.0266**	**0.3206**	**1.0200e-003**	**0.0827**	**7.2000e-004**	**0.0834**	**0.0224**	**6.6000e-004**	**0.0231**		**101.9928**	**101.9928**	**2.7700e-003**		**102.0620**

3.6 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	2.1831					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.9062
Total	**2.3876**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

3.6 Architectural Coating - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	6.5400e-003	4.1000e-003	0.0493	1.6000e-004	0.0164	1.1000e-004	0.0165	4.3600e-003	1.0000e-004	4.4600e-003		15.6912	15.6912	4.3000e-004		15.7019
Total	**6.5400e-003**	**4.1000e-003**	**0.0493**	**1.6000e-004**	**0.0164**	**1.1000e-004**	**0.0165**	**4.3600e-003**	**1.0000e-004**	**4.4600e-003**		**15.6912**	**15.6912**	**4.3000e-004**		**15.7019**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	2.1831					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817	0.0000	281.4481	281.4481	0.0183		281.9062
Total	**2.3876**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.9062**

3.6 Architectural Coating - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	6.5400e-003	4.1000e-003	0.0493	1.6000e-004	0.0127	1.1000e-004	0.0128	3.4500e-003	1.0000e-004	3.5500e-003		15.6912	15.6912	4.3000e-004		15.7019
Total	**6.5400e-003**	**4.1000e-003**	**0.0493**	**1.6000e-004**	**0.0127**	**1.1000e-004**	**0.0128**	**3.4500e-003**	**1.0000e-004**	**3.5500e-003**		**15.6912**	**15.6912**	**4.3000e-004**		**15.7019**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0799	0.2939	0.9531	3.5000e-003	0.3158	2.5900e-003	0.3184	0.0844	2.4100e-003	0.0868		356.5705	356.5705	0.0173		357.0017
Unmitigated	0.0799	0.2939	0.9531	3.5000e-003	0.3158	2.5900e-003	0.3184	0.0844	2.4100e-003	0.0868		356.5705	356.5705	0.0173		357.0017

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	48.00	52.16	44.24	137,218	137,218
Parking Lot	0.00	0.00	0.00		
Total	48.00	52.16	44.24	137,218	137,218

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	10.80	7.30	7.50	41.60	18.80	39.60	86	11	3
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.602700	0.040134	0.179939	0.104242	0.014985	0.005435	0.016642	0.024350	0.001934	0.001888	0.005938	0.000757	0.001056
Parking Lot	0.602700	0.040134	0.179939	0.104242	0.014985	0.005435	0.016642	0.024350	0.001934	0.001888	0.005938	0.000757	0.001056

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	2.6500e-003	0.0227	9.6500e-003	1.4000e-004		1.8300e-003	1.8300e-003		1.8300e-003	1.8300e-003		28.9457	28.9457	5.5000e-004	5.3000e-004	29.1177
NaturalGas Unmitigated	2.6500e-003	0.0227	9.6500e-003	1.4000e-004		1.8300e-003	1.8300e-003		1.8300e-003	1.8300e-003		28.9457	28.9457	5.5000e-004	5.3000e-004	29.1177

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	246.038	2.6500e-003	0.0227	9.6500e-003	1.4000e-004		1.8300e-003	1.8300e-003		1.8300e-003	1.8300e-003		28.9457	28.9457	5.5000e-004	5.3000e-004	29.1177
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**2.6500e-003**	**0.0227**	**9.6500e-003**	**1.4000e-004**		**1.8300e-003**	**1.8300e-003**		**1.8300e-003**	**1.8300e-003**		**28.9457**	**28.9457**	**5.5000e-004**	**5.3000e-004**	**29.1177**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	0.246038	2.6500e-003	0.0227	9.6500e-003	1.4000e-004		1.8300e-003	1.8300e-003		1.8300e-003	1.8300e-003		28.9457	28.9457	5.5000e-004	5.3000e-004	29.1177
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**2.6500e-003**	**0.0227**	**9.6500e-003**	**1.4000e-004**		**1.8300e-003**	**1.8300e-003**		**1.8300e-003**	**1.8300e-003**		**28.9457**	**28.9457**	**5.5000e-004**	**5.3000e-004**	**29.1177**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.2001	7.6300e-003	0.6622	4.0000e-005		3.6600e-003	3.6600e-003		3.6600e-003	3.6600e-003	0.0000	1.1928	1.1928	1.1500e-003	0.0000	1.2217
Unmitigated	0.2001	7.6300e-003	0.6622	4.0000e-005		3.6600e-003	3.6600e-003		3.6600e-003	3.6600e-003	0.0000	1.1928	1.1928	1.1500e-003	0.0000	1.2217

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	5.9800e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1740					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0201	7.6300e-003	0.6622	4.0000e-005		3.6600e-003	3.6600e-003		3.6600e-003	3.6600e-003		1.1928	1.1928	1.1500e-003		1.2217
Total	**0.2001**	**7.6300e-003**	**0.6622**	**4.0000e-005**		**3.6600e-003**	**3.6600e-003**		**3.6600e-003**	**3.6600e-003**	**0.0000**	**1.1928**	**1.1928**	**1.1500e-003**	**0.0000**	**1.2217**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	5.9800e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1740					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0201	7.6300e-003	0.6622	4.0000e-005		3.6600e-003	3.6600e-003		3.6600e-003	3.6600e-003		1.1928	1.1928	1.1500e-003		1.2217
Total	**0.2001**	**7.6300e-003**	**0.6622**	**4.0000e-005**		**3.6600e-003**	**3.6600e-003**		**3.6600e-003**	**3.6600e-003**	**0.0000**	**1.1928**	**1.1928**	**1.1500e-003**	**0.0000**	**1.2217**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Ida Ave Apartments Solana

San Diego County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	20.00	Space	0.18	8,000.00	0
Apartments Low Rise	8.00	Dwelling Unit	0.94	8,000.00	23

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2023
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	495.54	**CH4 Intensity (lb/MWhr)**	0.02	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Adjusted for 2023 RPS for SDG&E

Land Use - Applicant-provided project acres.

Construction Phase -

Grading - Onsite and offsite grading and site prep

Architectural Coating - PDF-AQ-1 use of low-VOC paints.

Vehicle Trips - Calculated based on LLG traffic report weekday trip rate.

Woodstoves - No wood burning stoves or natural gas fireplaces shall be constructed.

Area Coating - Applicant shall use low VOC paints.

Energy Use -

Water And Wastewater - CalEEMod default water and wastewater values used, assumed 100% aerobic.

Construction Off-road Equipment Mitigation - Implementation of dust control measures.

Trips and VMT - 8795 cy of soil export

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Residential_Exterior	250.00	50.00
tblArchitecturalCoating	EF_Residential_Interior	250.00	5.00
tblAreaCoating	Area_EF_Residential_Exterior	250	50
tblAreaCoating	Area_EF_Residential_Interior	250	5
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	26
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblFireplaces	FireplaceDayYear	82.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	NumberGas	4.40	0.00
tblFireplaces	NumberNoFireplace	0.80	8.00
tblFireplaces	NumberWood	2.80	0.00
tblGrading	AcresOfGrading	1.50	1.13

tblGrading	AcresOfGrading	1.00	1.13
tblGrading	MaterialExported	0.00	8,795.00
tblLandUse	LotAcreage	0.50	0.94
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.02
tblProjectCharacteristics	CO2IntensityFactor	720.49	495.54
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblTripsAndVMT	HaulingTripNumber	0.00	1,100.00
tblVehicleTrips	ST_TR	7.16	6.52
tblVehicleTrips	SU_TR	6.07	5.53
tblVehicleTrips	WD_TR	6.59	6.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWoodstoves	NumberCatalytic	0.40	0.00
tblWoodstoves	NumberNoncatalytic	0.40	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	3.4175	85.4505	24.8618	0.2231	9.9961	0.8580	10.8541	3.8962	0.7975	4.6936	0.0000	24,280.6323	24,280.6323	2.5651	0.0000	24,344.7593
2022	2.3951	12.7156	12.9894	0.0232	0.1068	0.5898	0.6772	0.0283	0.5697	0.5932	0.0000	2,124.0507	2,124.0507	0.4139	0.0000	2,132.9182
Maximum	**3.4175**	**85.4505**	**24.8618**	**0.2231**	**9.9961**	**0.8580**	**10.8541**	**3.8962**	**0.7975**	**4.6936**	**0.0000**	**24,280.6323**	**24,280.6323**	**2.5651**	**0.0000**	**24,344.7593**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	3.4175	85.4505	24.8618	0.2231	6.2171	0.8580	7.0752	2.2515	0.7975	3.0489	0.0000	24,280.6323	24,280.6323	2.5651	0.0000	24,344.7593
2022	2.3951	12.7156	12.9894	0.0232	0.0827	0.5898	0.6580	0.0224	0.5697	0.5885	0.0000	2,124.0507	2,124.0507	0.4139	0.0000	2,132.9182
Maximum	**3.4175**	**85.4505**	**24.8618**	**0.2231**	**6.2171**	**0.8580**	**7.0752**	**2.2515**	**0.7975**	**3.0489**	**0.0000**	**24,280.6323**	**24,280.6323**	**2.5651**	**0.0000**	**24,344.7593**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**37.64**	**0.00**	**32.94**	**42.06**	**0.00**	**31.20**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.2001	7.6300e-003	0.6622	4.0000e-005		3.6600e-003	3.6600e-003		3.6600e-003	3.6600e-003	0.0000	1.1928	1.1928	1.1500e-003	0.0000	1.2217
Energy	2.6500e-003	0.0227	9.6500e-003	1.4000e-004		1.8300e-003	1.8300e-003		1.8300e-003	1.8300e-003		28.9457	28.9457	5.5000e-004	5.3000e-004	29.1177
Mobile	0.0774	0.3027	0.9314	3.3200e-003	0.3158	2.6000e-003	0.3184	0.0844	2.4200e-003	0.0868		338.3545	338.3545	0.0173		338.7865
Total	**0.2801**	**0.3330**	**1.6033**	**3.5000e-003**	**0.3158**	**8.0900e-003**	**0.3239**	**0.0844**	**7.9100e-003**	**0.0923**	**0.0000**	**368.4929**	**368.4929**	**0.0190**	**5.3000e-004**	**369.1258**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.2001	7.6300e-003	0.6622	4.0000e-005		3.6600e-003	3.6600e-003		3.6600e-003	3.6600e-003	0.0000	1.1928	1.1928	1.1500e-003	0.0000	1.2217
Energy	2.6500e-003	0.0227	9.6500e-003	1.4000e-004		1.8300e-003	1.8300e-003		1.8300e-003	1.8300e-003		28.9457	28.9457	5.5000e-004	5.3000e-004	29.1177
Mobile	0.0774	0.3027	0.9314	3.3200e-003	0.3158	2.6000e-003	0.3184	0.0844	2.4200e-003	0.0868		338.3545	338.3545	0.0173		338.7865
Total	**0.2801**	**0.3330**	**1.6033**	**3.5000e-003**	**0.3158**	**8.0900e-003**	**0.3239**	**0.0844**	**7.9100e-003**	**0.0923**	**0.0000**	**368.4929**	**368.4929**	**0.0190**	**5.3000e-004**	**369.1258**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**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**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	7/1/2021	7/2/2021	5	2	
2	Grading	Grading	7/3/2021	7/8/2021	5	4	
3	Building Construction	Building Construction	7/9/2021	4/14/2022	5	200	
4	Paving	Paving	4/15/2022	4/28/2022	5	10	
5	Architectural Coating	Architectural Coating	4/29/2022	5/12/2022	5	10	

Acres of Grading (Site Preparation Phase): 1.13

Acres of Grading (Grading Phase): 1.13

Acres of Paving: 0.18

Residential Indoor: 16,200; Residential Outdoor: 5,400; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 480 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	187	0.41
Grading	Rubber Tired Dozers	1	6.00	247	0.40
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Building Construction	Cranes	1	6.00	231	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	6.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	3	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	1,100.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	9.00	2.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	2.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.8685	0.0000	5.8685	2.9612	0.0000	2.9612			0.0000			0.0000
Off-Road	1.5558	17.4203	7.5605	0.0172		0.7654	0.7654		0.7041	0.7041		1,666.5174	1,666.5174	0.5390		1,679.9920
Total	**1.5558**	**17.4203**	**7.5605**	**0.0172**	**5.8685**	**0.7654**	**6.6339**	**2.9612**	**0.7041**	**3.6653**		**1,666.5174**	**1,666.5174**	**0.5390**		**1,679.9920**

3.2 Site Preparation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0314	0.0202	0.1995	6.1000e-004	0.0657	4.5000e-004	0.0662	0.0174	4.2000e-004	0.0179		61.1638	61.1638	1.7600e-003		61.2077
Total	**0.0314**	**0.0202**	**0.1995**	**6.1000e-004**	**0.0657**	**4.5000e-004**	**0.0662**	**0.0174**	**4.2000e-004**	**0.0179**		**61.1638**	**61.1638**	**1.7600e-003**		**61.2077**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.6408	0.0000	2.6408	1.3325	0.0000	1.3325			0.0000			0.0000
Off-Road	1.5558	17.4203	7.5605	0.0172		0.7654	0.7654		0.7041	0.7041	0.0000	1,666.5174	1,666.5174	0.5390		1,679.9920
Total	**1.5558**	**17.4203**	**7.5605**	**0.0172**	**2.6408**	**0.7654**	**3.4062**	**1.3325**	**0.7041**	**2.0367**	**0.0000**	**1,666.5174**	**1,666.5174**	**0.5390**		**1,679.9920**

3.2 Site Preparation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0314	0.0202	0.1995	6.1000e-004	0.0509	4.5000e-004	0.0513	0.0138	4.2000e-004	0.0142		61.1638	61.1638	1.7600e-003		61.2077
Total	**0.0314**	**0.0202**	**0.1995**	**6.1000e-004**	**0.0509**	**4.5000e-004**	**0.0513**	**0.0138**	**4.2000e-004**	**0.0142**		**61.1638**	**61.1638**	**1.7600e-003**		**61.2077**

3.3 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.1251	0.0000	5.1251	2.5618	0.0000	2.5618			0.0000			0.0000
Off-Road	1.2884	14.3307	6.3314	0.0141		0.6379	0.6379		0.5869	0.5869		1,365.0648	1,365.0648	0.4415		1,376.1020
Total	**1.2884**	**14.3307**	**6.3314**	**0.0141**	**5.1251**	**0.6379**	**5.7630**	**2.5618**	**0.5869**	**3.1487**		**1,365.0648**	**1,365.0648**	**0.4415**		**1,376.1020**

3.3 Grading - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.0977	71.0996	18.3309	0.2084	4.8053	0.2197	5.0249	1.3169	0.2102	1.5271		22,854.4037	22,854.4037	2.1218		22,907.4495
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0314	0.0202	0.1995	6.1000e-004	0.0657	4.5000e-004	0.0662	0.0174	4.2000e-004	0.0179		61.1638	61.1638	1.7600e-003		61.2077
Total	**2.1291**	**71.1198**	**18.5304**	**0.2090**	**4.8710**	**0.2201**	**5.0911**	**1.3343**	**0.2106**	**1.5449**		**22,915.5675**	**22,915.5675**	**2.1236**		**22,968.6573**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.3063	0.0000	2.3063	1.1528	0.0000	1.1528			0.0000			0.0000
Off-Road	1.2884	14.3307	6.3314	0.0141		0.6379	0.6379		0.5869	0.5869	0.0000	1,365.0648	1,365.0648	0.4415		1,376.1020
Total	**1.2884**	**14.3307**	**6.3314**	**0.0141**	**2.3063**	**0.6379**	**2.9442**	**1.1528**	**0.5869**	**1.7397**	**0.0000**	**1,365.0648**	**1,365.0648**	**0.4415**		**1,376.1020**

3.3 Grading - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.0977	71.0996	18.3309	0.2084	3.8600	0.2197	4.0796	1.0849	0.2102	1.2950		22,854.4037	22,854.4037	2.1218		22,907.4495
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0314	0.0202	0.1995	6.1000e-004	0.0509	4.5000e-004	0.0513	0.0138	4.2000e-004	0.0142		61.1638	61.1638	1.7600e-003		61.2077
Total	**2.1291**	**71.1198**	**18.5304**	**0.2090**	**3.9108**	**0.2201**	**4.1309**	**1.0987**	**0.2106**	**1.3092**		**22,915.5675**	**22,915.5675**	**2.1236**		**22,968.6573**

3.4 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8125	13.6361	12.8994	0.0221		0.6843	0.6843		0.6608	0.6608		2,001.2200	2,001.2200	0.3573		2,010.1517
Total	**1.8125**	**13.6361**	**12.8994**	**0.0221**		**0.6843**	**0.6843**		**0.6608**	**0.6608**		**2,001.2200**	**2,001.2200**	**0.3573**		**2,010.1517**

3.4 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	6.3700e-003	0.2031	0.0578	5.3000e-004	0.0135	4.5000e-004	0.0140	3.9000e-003	4.3000e-004	4.3200e-003		56.7639	56.7639	4.4200e-003		56.8744
Worker	0.0353	0.0227	0.2244	6.9000e-004	0.0739	5.1000e-004	0.0744	0.0196	4.7000e-004	0.0201		68.8093	68.8093	1.9800e-003		68.8587
Total	**0.0417**	**0.2258**	**0.2822**	**1.2200e-003**	**0.0875**	**9.6000e-004**	**0.0884**	**0.0235**	**9.0000e-004**	**0.0244**		**125.5731**	**125.5731**	**6.4000e-003**		**125.7331**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8125	13.6361	12.8994	0.0221		0.6843	0.6843		0.6608	0.6608	0.0000	2,001.2200	2,001.2200	0.3573		2,010.1517
Total	**1.8125**	**13.6361**	**12.8994**	**0.0221**		**0.6843**	**0.6843**		**0.6608**	**0.6608**	**0.0000**	**2,001.2200**	**2,001.2200**	**0.3573**		**2,010.1517**

3.4 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	6.3700e-003	0.2031	0.0578	5.3000e-004	0.0110	4.5000e-004	0.0115	3.2800e-003	4.3000e-004	3.7100e-003		56.7639	56.7639	4.4200e-003		56.8744
Worker	0.0353	0.0227	0.2244	6.9000e-004	0.0572	5.1000e-004	0.0577	0.0155	4.7000e-004	0.0160		68.8093	68.8093	1.9800e-003		68.8587
Total	**0.0417**	**0.2258**	**0.2822**	**1.2200e-003**	**0.0683**	**9.6000e-004**	**0.0692**	**0.0188**	**9.0000e-004**	**0.0197**		**125.5731**	**125.5731**	**6.4000e-003**		**125.7331**

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6487	12.5031	12.7264	0.0221		0.5889	0.5889		0.5689	0.5689		2,001.5429	2,001.5429	0.3486		2,010.2581
Total	**1.6487**	**12.5031**	**12.7264**	**0.0221**		**0.5889**	**0.5889**		**0.5689**	**0.5689**		**2,001.5429**	**2,001.5429**	**0.3486**		**2,010.2581**

3.4 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.9300e-003	0.1918	0.0547	5.2000e-004	0.0135	3.8000e-004	0.0139	3.9000e-003	3.7000e-004	4.2600e-003		56.2205	56.2205	4.2800e-003		56.3276
Worker	0.0335	0.0207	0.2082	6.7000e-004	0.0739	5.0000e-004	0.0744	0.0196	4.6000e-004	0.0201		66.2873	66.2873	1.8100e-003		66.3326
Total	**0.0394**	**0.2125**	**0.2629**	**1.1900e-003**	**0.0875**	**8.8000e-004**	**0.0884**	**0.0235**	**8.3000e-004**	**0.0243**		**122.5078**	**122.5078**	**6.0900e-003**		**122.6601**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6487	12.5031	12.7264	0.0221		0.5889	0.5889		0.5689	0.5689	0.0000	2,001.5429	2,001.5429	0.3486		2,010.2581
Total	**1.6487**	**12.5031**	**12.7264**	**0.0221**		**0.5889**	**0.5889**		**0.5689**	**0.5689**	**0.0000**	**2,001.5429**	**2,001.5429**	**0.3486**		**2,010.2581**

3.4 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.9300e-003	0.1918	0.0547	5.2000e-004	0.0110	3.8000e-004	0.0114	3.2800e-003	3.7000e-004	3.6500e-003		56.2205	56.2205	4.2800e-003		56.3276
Worker	0.0335	0.0207	0.2082	6.7000e-004	0.0572	5.0000e-004	0.0577	0.0155	4.6000e-004	0.0160		66.2873	66.2873	1.8100e-003		66.3326
Total	**0.0394**	**0.2125**	**0.2629**	**1.1900e-003**	**0.0683**	**8.8000e-004**	**0.0691**	**0.0188**	**8.3000e-004**	**0.0196**		**122.5078**	**122.5078**	**6.0900e-003**		**122.6601**

3.5 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6877	6.7738	8.8060	0.0135		0.3474	0.3474		0.3205	0.3205		1,297.3789	1,297.3789	0.4113		1,307.6608
Paving	0.0472					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7348**	**6.7738**	**8.8060**	**0.0135**		**0.3474**	**0.3474**		**0.3205**	**0.3205**		**1,297.3789**	**1,297.3789**	**0.4113**		**1,307.6608**

3.5 Paving - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0483	0.0299	0.3008	9.6000e-004	0.1068	7.2000e-004	0.1075	0.0283	6.6000e-004	0.0290		95.7483	95.7483	2.6100e-003		95.8137
Total	**0.0483**	**0.0299**	**0.3008**	**9.6000e-004**	**0.1068**	**7.2000e-004**	**0.1075**	**0.0283**	**6.6000e-004**	**0.0290**		**95.7483**	**95.7483**	**2.6100e-003**		**95.8137**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6877	6.7738	8.8060	0.0135		0.3474	0.3474		0.3205	0.3205	0.0000	1,297.3789	1,297.3789	0.4113		1,307.6608
Paving	0.0472					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7348**	**6.7738**	**8.8060**	**0.0135**		**0.3474**	**0.3474**		**0.3205**	**0.3205**	**0.0000**	**1,297.3789**	**1,297.3789**	**0.4113**		**1,307.6608**

3.5 Paving - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0483	0.0299	0.3008	9.6000e-004	0.0827	7.2000e-004	0.0834	0.0224	6.6000e-004	0.0231		95.7483	95.7483	2.6100e-003		95.8137
Total	**0.0483**	**0.0299**	**0.3008**	**9.6000e-004**	**0.0827**	**7.2000e-004**	**0.0834**	**0.0224**	**6.6000e-004**	**0.0231**		**95.7483**	**95.7483**	**2.6100e-003**		**95.8137**

3.6 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	2.1831					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.9062
Total	**2.3876**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

3.6 Architectural Coating - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	7.4300e-003	4.6000e-003	0.0463	1.5000e-004	0.0164	1.1000e-004	0.0165	4.3600e-003	1.0000e-004	4.4600e-003		14.7305	14.7305	4.0000e-004		14.7406
Total	**7.4300e-003**	**4.6000e-003**	**0.0463**	**1.5000e-004**	**0.0164**	**1.1000e-004**	**0.0165**	**4.3600e-003**	**1.0000e-004**	**4.4600e-003**		**14.7305**	**14.7305**	**4.0000e-004**		**14.7406**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	2.1831					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817	0.0000	281.4481	281.4481	0.0183		281.9062
Total	**2.3876**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.9062**

3.6 Architectural Coating - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	7.4300e-003	4.6000e-003	0.0463	1.5000e-004	0.0127	1.1000e-004	0.0128	3.4500e-003	1.0000e-004	3.5500e-003		14.7305	14.7305	4.0000e-004		14.7406
Total	**7.4300e-003**	**4.6000e-003**	**0.0463**	**1.5000e-004**	**0.0127**	**1.1000e-004**	**0.0128**	**3.4500e-003**	**1.0000e-004**	**3.5500e-003**		**14.7305**	**14.7305**	**4.0000e-004**		**14.7406**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0774	0.3027	0.9314	3.3200e-003	0.3158	2.6000e-003	0.3184	0.0844	2.4200e-003	0.0868		338.3545	338.3545	0.0173		338.7865
Unmitigated	0.0774	0.3027	0.9314	3.3200e-003	0.3158	2.6000e-003	0.3184	0.0844	2.4200e-003	0.0868		338.3545	338.3545	0.0173		338.7865

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	48.00	52.16	44.24	137,218	137,218
Parking Lot	0.00	0.00	0.00		
Total	48.00	52.16	44.24	137,218	137,218

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	10.80	7.30	7.50	41.60	18.80	39.60	86	11	3
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.602700	0.040134	0.179939	0.104242	0.014985	0.005435	0.016642	0.024350	0.001934	0.001888	0.005938	0.000757	0.001056
Parking Lot	0.602700	0.040134	0.179939	0.104242	0.014985	0.005435	0.016642	0.024350	0.001934	0.001888	0.005938	0.000757	0.001056

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	2.6500e-003	0.0227	9.6500e-003	1.4000e-004		1.8300e-003	1.8300e-003		1.8300e-003	1.8300e-003		28.9457	28.9457	5.5000e-004	5.3000e-004	29.1177
NaturalGas Unmitigated	2.6500e-003	0.0227	9.6500e-003	1.4000e-004		1.8300e-003	1.8300e-003		1.8300e-003	1.8300e-003		28.9457	28.9457	5.5000e-004	5.3000e-004	29.1177

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	246.038	2.6500e-003	0.0227	9.6500e-003	1.4000e-004		1.8300e-003	1.8300e-003		1.8300e-003	1.8300e-003		28.9457	28.9457	5.5000e-004	5.3000e-004	29.1177
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**2.6500e-003**	**0.0227**	**9.6500e-003**	**1.4000e-004**		**1.8300e-003**	**1.8300e-003**		**1.8300e-003**	**1.8300e-003**		**28.9457**	**28.9457**	**5.5000e-004**	**5.3000e-004**	**29.1177**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	0.246038	2.6500e-003	0.0227	9.6500e-003	1.4000e-004		1.8300e-003	1.8300e-003		1.8300e-003	1.8300e-003		28.9457	28.9457	5.5000e-004	5.3000e-004	29.1177
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**2.6500e-003**	**0.0227**	**9.6500e-003**	**1.4000e-004**		**1.8300e-003**	**1.8300e-003**		**1.8300e-003**	**1.8300e-003**		**28.9457**	**28.9457**	**5.5000e-004**	**5.3000e-004**	**29.1177**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.2001	7.6300e-003	0.6622	4.0000e-005		3.6600e-003	3.6600e-003		3.6600e-003	3.6600e-003	0.0000	1.1928	1.1928	1.1500e-003	0.0000	1.2217
Unmitigated	0.2001	7.6300e-003	0.6622	4.0000e-005		3.6600e-003	3.6600e-003		3.6600e-003	3.6600e-003	0.0000	1.1928	1.1928	1.1500e-003	0.0000	1.2217

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	5.9800e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1740					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0201	7.6300e-003	0.6622	4.0000e-005		3.6600e-003	3.6600e-003		3.6600e-003	3.6600e-003		1.1928	1.1928	1.1500e-003		1.2217
Total	**0.2001**	**7.6300e-003**	**0.6622**	**4.0000e-005**		**3.6600e-003**	**3.6600e-003**		**3.6600e-003**	**3.6600e-003**	**0.0000**	**1.1928**	**1.1928**	**1.1500e-003**	**0.0000**	**1.2217**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	5.9800e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1740					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0201	7.6300e-003	0.6622	4.0000e-005		3.6600e-003	3.6600e-003		3.6600e-003	3.6600e-003		1.1928	1.1928	1.1500e-003		1.2217
Total	**0.2001**	**7.6300e-003**	**0.6622**	**4.0000e-005**		**3.6600e-003**	**3.6600e-003**		**3.6600e-003**	**3.6600e-003**	**0.0000**	**1.1928**	**1.1928**	**1.1500e-003**	**0.0000**	**1.2217**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

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Appendix B
Biological Resources Assessment

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605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 F 760.632.0164

March 8, 2021 11051

Mr. Shantu Patel
KNN Management, LLC.
1280 Hoover Street
Carlsbad, California 92008

Subject: Assessment of Biological Resources for the Ida Avenue Project, APN Number 298-162-370, City of Solana Beach, California

Dear Mr. Patel:

This biological resources report describes the existing biological conditions, analysis of sensitivity of the habitat, and impact analysis of the Ida Avenue property (proposed project). The proposed project encompasses approximately 1.44 acres and is inclusive of the 0.94-acre property and 0.50-acre off-site area of temporary impacts, located along the eastern side of Ida Avenue, west of Interstate 5, in the City of Solana Beach (City), California. Because the project is located in the coastal zone, the California Coastal Commission (CCC) requires compliance with the California Coastal Act, through the City's approved Local Coastal Program Land Use Plan (LCP; City of Solana Beach 2014). The LCP currently identifies non-native grassland and disturbed habitat on the property and does not designate it as Environmentally Sensitive Habitat Areas (ESHAs) or Potential ESHA. Per the LCP provisions, and as requested by the City of Solana Beach, a site-specific biological analysis is required as a part of the development review for the project. The purpose of this biological assessment is to provide a site-specific analysis of the existing site conditions and to discuss the findings in terms of the City's ESHA designations.

Regulatory Setting

California Coastal Commission and Solana Beach Local Coastal Program

Under the California Coastal Act, the CCC regulates the "coastal zone" and requires a Coastal Development Permit for development within this zone. The California Coastal Act also directs each coastal city or county to prepare an LCP, which is certified by the CCC, to guide development in the coastal zone. After an LCP has been approved, the permitting authority of the CCC is transferred to the local government. The City of Solana Beach Local Coastal Plan (City of Solana Beach 2014) is an approved LCP.

The City's LCP consists of the adopted Land Use Plan and provides citywide strategies and policies for land planning, development, and sensitive area protections. The LCP was first adopted on February 27, 2013, and was amended in June 11, 2014. According to Chapter 3 of the LCP, ESHAs are identified and defined as any plant or animal species, including their associated habitats, that are considered rare or especially valuable. These designated ESHAs are protected, and development within ESHAs is not allowed, with the exception of uses dependent on the resources. Furthermore, any proposed development adjacent to an ESHA shall be designed to prevent impacts that could potentially degrade the ESHA. Exhibits 3-6 through 3-10 of the LCP present the ESHAs throughout the City. Some areas identified as native habitat cannot be decisively mapped as an ESHA without a site-specific study; thus, they are

presented as "Areas of Potential ESHA" on Exhibits 3-6 through 3-10. Prior to development within or adjacent to these Potential ESHAs, a final determination of ESHA will be made by the City based on the site-specific study.

Project Location

The proposed project site is situated between Ida Avenue to the west and the Interstate 5 freeway immediately to the east. It is located just north of the 734 Ida Avenue property in the City of Solana Beach, California (Figure 1). The Pacific Ocean is approximately 1.05 miles to the west (Figure 1). The site is located at approximately longitude 17°15′20.74″W and latitude 32°59′11.99″N (Figure 1).

Site Description

The Ida Avenue property currently occupies approximately 0.94 acres on site. Additionally, the approximate 0.50-acre off-site area includes a 0.17-acre area that is vegetated and runs along the east side of the property along Interstate 5, and an additional 0.33-acre area that runs along the west side of the property that encompasses Ida Avenue and is already paved and developed, for a total of 1.44 acres. The property slopes slightly to the west towards Ida Avenue. There is a chain-link fence that runs north/south and separates the far eastern side of the off-site site area from the western on site property. The eastern portion of the project site immediately adjacent to the freeway is California Department of Transportation (Caltrans) right-of-way (ROW), which is regularly irrigated and consists of predominantly native vegetation such as California sagebrush (*Artemisia californica*) and California buckwheat (*Eriogonum fasciculatum*). The western portion, the on-site property, is composed almost entirely of disturbed, non-native vegetation and groundcover such as iceplant (*Carpobrotus edulis*), Russian thistle (*Salsola tragus*), and telegraph weed (*Heterotheca grandiflora*). There is a small dirt lot at the extreme northern end of the property where local residents frequently park their vehicles. Existing residential development is present directly to the west and south side of the property. Topography across the site is characterized by gentle slopes (less than 25% grade), and the site is nearly completely vegetated. Two soil types are mapped within the project site according to the Natural Resources Conservation Service (USDA 2019): Carlsbad gravelly loamy sand, 9% to 15% slopes (CbD). This soil type occurs between 30 feet above mean sea level (AMSL) and 300 feet AMSL, and is often characterized by convex down-slope and convex across-slope shapes. This soil type is moderately well-drained and in a low runoff class (USDA 2019). The other soil type within the project site is Corralitos loamy sand, 9% to 15% slopes (CsD). This soil type occurs between 30 feet AMSL and 1,000 feet AMSL, and is often characterized by linear down-slope and convex across-slope shapes. This soil type is somewhat excessively drained and in a very low runoff class (USDA 2019).

Project Description

The proposed project is for a small apartment complex building in the southern portion of the site and associated landscaping in the northern portion. The entire Ida Avenue property is anticipated to be developed. Off site, manufactured vegetated slope and disturbed or developed land will be graded, cleared, and brought up to finished grade. Impacts will be temporary as the area will be restored/hydroseeded with a native seed mix to pre-project conditions or returned to original condition at project completion.

Methods

Data regarding biological resources present within the project site were obtained through field reconnaissance, as described in detail below.

Field Reconnaissance

A biological survey of the approximate 1.44-acre project site was conducted by Dudek biologist Shana Carey on October 10, 2019 (Table 1). The survey included the mapping of vegetation communities and land covers present within the project site and an evaluation of the potential for special-status species to occur. For purposes of this report, the project site is defined as the 1.44-acre area including both on- and off-site areas. Photographs were captured during the site survey and are included with this report as Appendix A.

Table 1. Survey Conditions

Date	Time	Personnel	Survey Conditions
10/10/2019	1700-1900	Shana Carey	68°–71°F, 0% cloud cover, 2–5 mph wind

Vegetation Community and Land Cover Mapping

The survey was conducted on foot to visually cover 100% of the project site. A 50-scale (i.e., 50 feet = 1 inch) aerial photograph map (Bing Maps 2016) with an overlay of the project site was used to map the vegetation communities and record any special-status biological resources directly in the field.

The vegetation community and land cover mapping follows the classifications described by Holland (1986). In some cases, Oberbauer et al. (2008) was also consulted as a reference, especially with regards to non-native vegetation communities and land cover types. Areas on site supporting less than 20% native plant species cover were mapped as disturbed land. Vegetation community and land cover mapping was conducted for the entire project site to capture any adjacent biological resources. Following completion of the field work, Dudek Geographic Information System (GIS) Specialist Curtis Battle digitized the mapped results using ArcGIS and calculated coverage acreages using ArcCAD.

Plants

All plant species encountered during the field survey were identified and recorded directly into a field notebook.

Latin and common names for plant species follow the Jepson Interchange List of Currently Accepted Names of Native and Naturalized Plants of California (Jepson Flora Project 2016) and common names follow the U.S. Department of Agriculture Natural Resources Conservation Service Plants Database (USDA 2016).

Special-Status Plants and Animals

No observable biological resources, including perennial plants commonly accepted as regionally sensitive by the California Department of Fish and Wildlife, U.S. Fish and Wildlife Service, and the City, were identified during the site visit.

Focused surveys for special-status wildlife were not conducted as they are not expected to occur due to the small nature of the site, urbanized setting, and lack of connectivity to natural open space areas.

Results

The quantification of biological resources described below pertains to the subject property and any off-site impact areas.

Existing Conditions

Vegetation Communities and Land Cover Types

Based on species composition and general physiognomy of the site, one native vegetation community and two land cover type were identified within the project site. The vegetation community and land cover types are described in detail below; their acreages are presented in Table 2; and their spatial distributions are presented in the Vegetation Map (Figure 2). Sensitive vegetation communities within the City, as prescribed by the LCP, include southern coastal salt marsh, freshwater marsh, southern willow scrub, mulefat scrub, open water/estuarine, beach, southern coastal bluff scrub, southern maritime chaparral, Diegan coastal sage scrub, southern mixed chaparral, coastal sage-chaparral scrub, and non-native grassland (City of Solana Beach 2018).

On-Site Vegetation/Land Covers

Developed land, according to Oberbauer et al. 2008, represents areas that have been constructed upon or otherwise physically altered to an extent that native vegetation communities are not supported. This land cover type generally consists of semi-permanent structures, homes, parking lots, pavement or hardscape, and landscaped areas that require maintenance and irrigation (e.g., ornamental greenbelts). Typically, this land cover type is unvegetated, but may also contain ornamental vegetation associated with development. This land cover type is not considered sensitive under the LCP.

Within the property, area mapped as developed land includes the small parking area immediately adjacent to Ida Avenue in the northern portion of the site. This land cover type is not considered sensitive.

Disturbed Habitat is a land cover type characterized by a predominance of non-native species, often introduced and established through human action. Oberbauer et al. (2008) describes disturbed habitat as areas that have been physically disturbed (by previous legal human activity) and are no longer recognizable as a native or naturalized vegetation association, but that continue to retain a soil substrate. Typically, vegetation, if present, is nearly exclusively composed of non-native annual plant species (i.e., weeds). This land cover type is not considered sensitive under the LCP.

Within the property, disturbed habitat is present throughout the majority of the site, but predominantly west of the chain-link fence that runs through the site. The most common non-native vegetation species on-site include hottentot fig (iceplant), Russian thistle, and *Acacia* sp.

The on-site vegetation/land cover is highly disturbed and does not qualify as ESHA. In support of that, the LUP did not identify the site as ESHA. The site is small, contains no native vegetation, and does not contain special-status species.

Table 2. Vegetation Communities and Land Cover Types On and Off the Project Site

Vegetation Community/Land Cover	Direct Impacts (Acres)
On Site	
Developed (DEV)	0.02
Disturbed Habitat (DH)	0.92
Total On Site	**0.94**
Off Site	
Disturbed Diegan Coastal Sage Scrub	0.15
Developed (DEV)	0.33
Disturbed Habitat (DH)	0.02
Total Off Site	**0.50**
Total	**1.44**

Off-Site Vegetation/Land Covers

Disturbed Diegan Coastal Sage Scrub is a community described by Holland (1986) and Oberbauer et al. (2008) as a vegetation community that is characterized by low-growing, soft-woody subshrubs most active in winter and spring. The community is largely dominated by California sagebrush, California buckwheat, laurel sumac (*Malosma laurina*), and black sage (*Salvia mellifera*). It is often found in areas with little moisture and areas with clay-rich soils.

Within the project off-site area, this vegetation community is primarily located in a thin strip that runs along the entire eastern boundary within the off-site Caltrans ROW. It is dominated by California sagebrush (approximately 35% cover) and California buckwheat (approximately 35% cover). Additional species characteristic of disturbed Diegan coastal sage scrub that were observed include lemonadeberry (*Rhus integrifolia*), bush sunflower (*Encelia californica*), and black sage.

Additionally within the project off-site area, there are other areas of developed land and disturbed habitat. The developed area is located immediately west of the property and encompasses the paved Ida Avenue. The disturbed land is located within the Caltrans ROW immediately adjacent to the property fenceline, as well as along the extreme northern border of the property. Neither of these land cover types are considered sensitive

Similar to the on-site areas, the off-site areas do not qualify as ESHA and were not identified in the LUP as ESHA. The areas are small and highly disturbed; are part of the freeway ROW; were planted as erosion control for the

freeway; and are located on a manufactured slope. Special-status species were not observed during surveys for the freeway widening.

No special-status plant or wildlife species were detected on or off site. While there is Diegan coastal sage scrub present within the Caltrans ROW, the strip of habitat is very narrow, subject to noise and disturbance, and was planted for erosion control on the manufactured slope next to the pavement of the freeway. There is no potential for special-status species such as California gnatcatcher (*Polioptila californica*) to be present within this narrow strip, and the species was not detected during the studies conducted by Caltrans for the freeway widening.

Impacts

On site, 0.92 acres of disturbed habitat and 0.02 acres of urban/developed landcover will be cleared and graded for the construction of an apartment complex building in the southern portion of the site and associated landscaping in the northern portion (Figure 3; Table 3).

Off site, 0.15 acres of manufactured, hydroseeded, disturbed Diegan coastal sage scrub within the Caltrans ROW will be graded, cleared, and brought up to finished grade. Impacts will be temporary as the area will be restored/hydroseeded with a native seed mix to pre-project conditions at project completion. Other off-site impacts will occur to 0.01 acres of disturbed habitat, as well as to an additional 0.01 acres of disturbed habitat within the Caltrans ROW. There will also be temporary impacts to 0.33 acres of urban/developed land. All off-site impacts will be restored to original condition upon completion of the project.

Table 3. On-Site and Off-Site Impacts to Vegetation Communities and Land Cover Types as a Result of the Proposed Project

Vegetation Community/Land Cover	Direct Impacts (Acres)	Temporary Impacts (Acres)
On Site		
Developed (DEV)	0.02	—
Disturbed Habitat (DH)	0.92	—
Subtotal	*0.94*	—
Off Site		
Disturbed Diegan Coastal Sage Scrub (within Caltrans ROW)	—	0.15
Developed (DEV)	—	0.33
Disturbed Habitat (DH)	—	0.01
Disturbed Habitat (DH) (within Caltrans ROW)	—	0.01
Subtotal	—	*0.50*
Project Site Total	**0.94**	**1.44**

Conclusion

The proposed project will not result in impacts to sensitive resources that require mitigation. Based on the biological survey, the on-site impacts are to disturbed habitat or developed lands. The off-site impacts are to disturbed habitat, developed land, and Caltrans ROW erosion control coastal sage scrub. The erosion control is on a manufactured slope of the ROW. At project completion, the slope will be brought up to finished grade per requirements of Caltrans. The slope will also be restored to pre-project conditions as it will be hydroseeded with a native seed mix as directed by Caltrans; thus, impacts will be temporary.

The site was also reviewed for applicability of the ESHA policies. The project site was determined not to be subject to the ESHA protection policies, and no buffers are required as there is no ESHA on or off site. ESHAs are identified and defined by the City of Solana Beach LCP as any plant or animal species, including their associated habitats that are considered rare or especially valuable (City of Solana Beach 2014). Based on the results of the biological survey and habitat mapping, the vegetation within the off-site Caltrans ROW, disturbed Diegan coastal sage scrub, does not meet ESHA criteria. Furthermore, the City of Solana Beach's LCP did not map any of the disturbed habitat within the project site as ESHA.

If you have any questions regarding this report, please contact me via telephone at 760.334.1993 or via email at scarey@dudek.com.

Sincerely,

Shana Carey

Shana Carey
Biologist

Att.: Figures 1–3
Appendix A, Overview Photos of Habitat On Site and Off Site Within Caltrans ROW

References Cited

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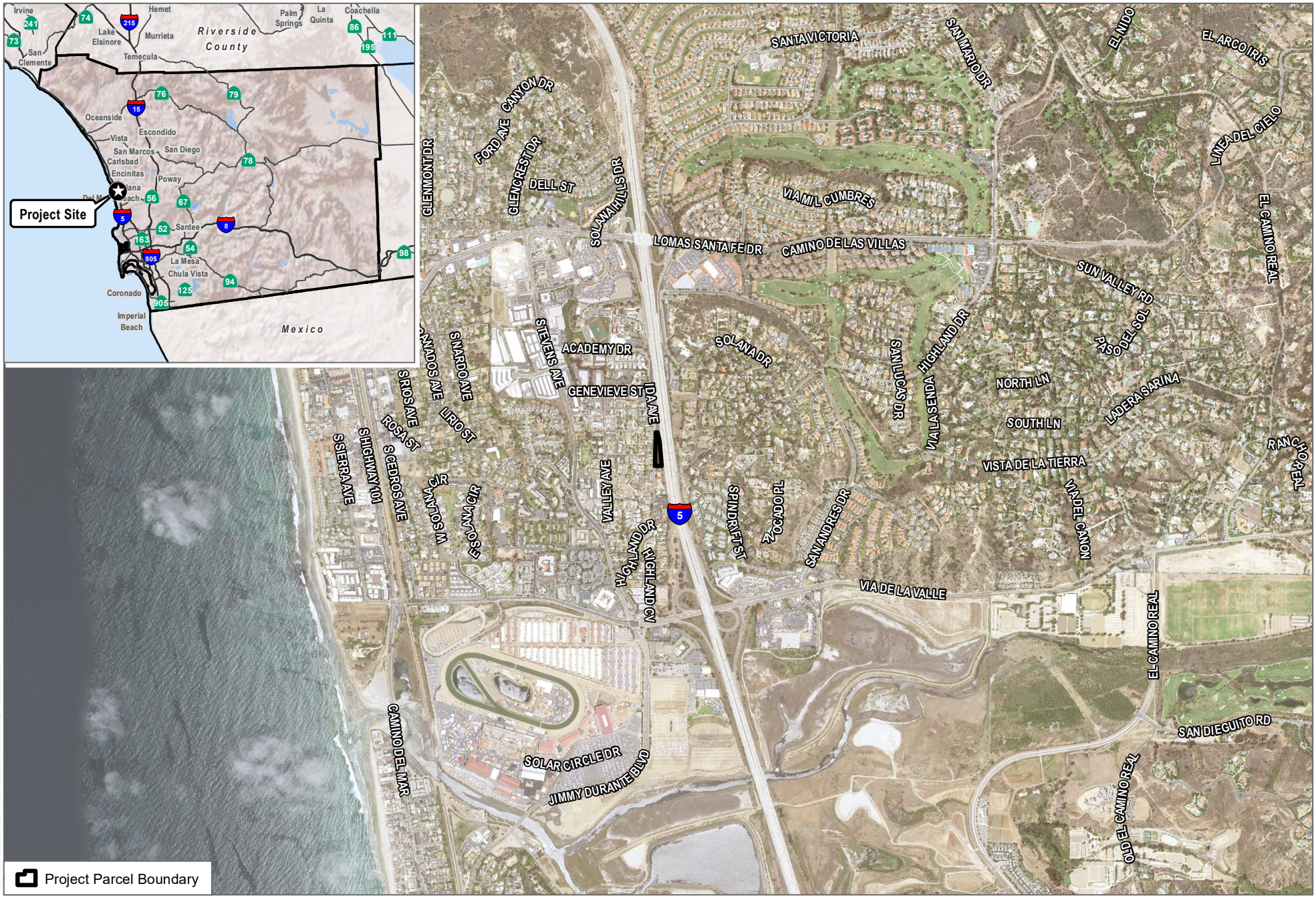
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SOURCE: NAIP 2016

DUDEK

0 1,000 2,000 Feet

FIGURE 1

Project Location

Biological Resources Report for the Ida Avenue Project



SOURCE: SANGIS 2017

DUDEK

0 30 60 Feet

FIGURE 2

Biological Resources

Biological Resources Report for the Ida Avenue Project



SOURCE: Chereskin Architecture 2019; SANGIS 2017

DUDEK

0 30 60 Feet

FIGURE 3

Impacts to Biological Resources

Biological Resources Report for the Ida Avenue Project

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Appendix A

Overview Photos of Habitat On Site and Off Site Within Caltrans ROW



Photo 1: Representative photo of disturbed habitat within project site. Facing SE.



Photo 2: Representative photo of disturbed Diegan coastal sage scrub habitat within the Caltrans ROW. Facing south.



Photo 3: Representative photo of disturbed Diegan coastal sage scrub habitat.within the project site. Facing north.



Photo 4: Representative photo of disturbed habitat and disturbed Diegan coastal sage scrub habitat within the Caltrans ROW. Facing north.

Path: Z:\Projects\11959\01\MAP\DOC\DOCUMENT\LBVI_SWEL

Appendix C
Cultural Resources Inventory Report

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Cultural Resources Inventory Report
for the
Ida Avenue Apartments Project
City of Solana Beach, San Diego County, California
Dudek Project No. 12302

Prepared for:

KNN Management LLC
1280 Hoover Street
Carlsbad, California 92008
Contact: Shantu Patel

Prepared by:

Matthew DeCarlo, MA
and Micah J. Hale, PhD, RPA

DUDEK

605 Third Street
Encinitas, California 92024

FEBRUARY 2021

Printed on 30% post-consumer recycled material.

National Archaeological Database (NADB) Information

Authors:	Matthew DeCarlo, MA and Micah J. Hale, PhD, RPA
Firm:	Dudek
Project Proponent:	KNN Management LLC
Report Date:	February 2021
Report Title:	Cultural Resources Inventory Report for the Ida Avenue Apartments Project, City of Solana Beach, San Diego County, California
Type of Study:	Cultural Resources Inventory
Resources:	None
USGS Quads:	Del Mar
Acreage:	1.44 acres
Permit Numbers:	N/A
Keywords:	Solana Beach; intensive pedestrian survey; Kumeyaay; prehistoric, shell midden

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Table of Contents

SECTION PAGE NO.

NATIONAL ARCHAEOLOGICAL DATABASE (NADB) INFORMATION i

ACRONYMS AND ABBREVIATIONS v

MANAGEMENT SUMMARY vii

1 PROJECT DESCRIPTION AND LOCATION 1

1.1 Regulatory Context 1

1.1.1 California Register of Historical Resources (California Public Resources Code, Section 5020 et seq.) 1

1.1.2 Native American Historic Cultural Sites (California Public Resources Code, Section 5097 et seq.) 2

1.1.3 California Native American Graves Protection and Repatriation Act 2

1.1.4 California Health and Safety Code Section 7050.5 2

1.1.5 California Environmental Quality Act 3

1.1.6 Solana Beach Municipal Code 6

1.1.7 General Plan Conservation and Open Space Element 6

1.1.8 Coastal Land Use Plan 7

1.2 Project Personnel 7

1.3 Report Structure 7

2 SETTING 13

2.1 Natural Setting 13

2.2 Cultural Setting 13

2.2.1 Paleoindian (pre-5500 BC) 13

2.2.2 Archaic (8000 BC–AD 500) 14

2.2.3 Late Prehistoric (AD 500–1769) 15

2.2.4 Ethnohistoric (post-AD 1769) 15

2.2.5 Historic Period (post-AD 1542) 18

2.3 South Coastal Information Center Records Search 20

2.4 Historic Aerial Photograph Analysis 21

2.5 NAHC Sacred Lands File Search 22

3 METHODS 23

3.1 Survey 23

4 RESULTS 25

4.1 Survey Results 25

5 MANAGEMENT CONSIDERATIONS 27

5.1 Resource Management 27

6 REFERENCES 29
7 CERTIFICATION 33

APPENDICES

A Project Personnel Qualification
B SCIC Records Search Results
C NAHC Sacred Lands File Search Results and Tribal Correspondence

FIGURES

1 Project Location 9
2 APE Map 11

TABLE

1 Cultural Resources within 1 Mile of the Area of Potential Effect 21

Acronyms and Abbreviations

Acronym	Definition
APE	area of potential effect
CEQA	California Environmental Quality Act
City	City of Solana Beach
CRHR	California Register of Historical Resources
I	Interstate
NAHC	Native American Heritage Commission
NRHP	National Register of Historic Places
Project	Ida Avenue Apartment Project
SCIC	South Coastal Information Center

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Management Summary

The Ida Avenue Apartment Project (Project) consists of a residential development in the City of Solana Beach, California. KNN Management LLC hired Dudek to conduct a cultural resources inventory in compliance with the California Environmental Quality Act (CEQA) and the City of Solana Beach's General Plan. The proposed Project's area of potential effect (APE) consists of the Project, a vacant property located at Assessor's Parcel Number 298-162-37-00, and the Caltrans right of way (ROW) located immediately adjacent to the Project site.

This inventory includes a records search at the South Coastal Information Center at San Diego State University. The records search identified 33 cultural resources within 1 mile of the APE, but none are located within the APE. One resource, P-37-013484/CA-SDI-13484, is located immediately south of the Project APE. The records search identified 81 studies that have been previously conducted within 1 mile of the Project site, 10 of which intersect the APE. One of these studies describes the archaeological evaluation of P-37-013484/CA-SDI-13484.

Dudek reviewed historic aerial images to understand past development and land use of the Project APE. The historic aerial imagery shows that the APE was unaltered except the surrounding development since 1953.

Results of a Native American Heritage Commission (NAHC) Sacred Lands File search were negative for the APE. The NAHC response letter included a list of Native American group representatives who should be contacted. Dudek mailed outreach letters to all Native American representatives included on the NAHC contact list. Dudek received responses from Viejas Band of Kumeyaay Indians and San Pasqual Band of Mission Indians. Neither Band indicated the presence of known resources within the Project APE, but Viejas requested that a Kumeyaay Cultural Monitor be present during Project ground disturbance. No other responses have been received to date.

A Dudek archaeologist and a Red Tail Native American monitor conducted a pedestrian survey of the Project APE. Though undeveloped, the APE was completely covered by vegetation and ground visibility was very poor. The pedestrian survey did not identify any cultural or built-environment resources within the Project APE, including the Project and the adjacent Caltrans ROW.

In spite of the negative South Coastal Information Center records search and pedestrian survey, the proximity of a cultural resources, the undeveloped nature of the APE, and poor ground visibility increase the cultural sensitivity of the Project APE. Dudek recommends archaeological and Kumeyaay Native American monitoring during the initial ground disturbance to assure proper treatment of inadvertent cultural discoveries.

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1 Project Description and Location

The Ida Avenue Apartment Project (Project) consists of a residential development in Solana Beach, California. KNN Management LLC hired Dudek to conduct a cultural resources inventory in compliance with the California Environmental Quality Act (CEQA), the City of Solana Beach's General Plan.

The Project site is a vacant property located at Assessor's Parcel Number 298-162-37-00. The Project proposes the development of a new 8-unit multifamily residential structure and associated parking. The Project is located immediately west of Interstate (I) 5, north of the San Dieguito Valley (Figure 1, Project Location). The undeveloped Project site is surrounded by residential development to the south and west. The Project also proposes temporary impacts to the Caltrans right of way (ROW) immediately adjacent to the Project site. The Project site is located on the U.S. Geological Survey Del Mar 7.5-minute topographic quadrangle. The current area of potential effect (APE) includes the 0.94-acre residential lot at Assessor's Parcel Number 298-162-37-00 and 0.50-acres of temporary construction impacts to the Caltrans ROW (Figure 2, APE Map). The entire 1.44-acre APE was subject to pedestrian survey.

This report documents the results of the archaeological resources inventory including a records search, pedestrian survey, and Native American participation. The goal of this inventory is to provide data to the City of Solana Beach (City) as the lead agency to aid in the management of cultural resources during the implementation of the Project.

1.1 Regulatory Context

The proposed Project is subject to state and local regulations regarding cultural resources. The following section provides a summary of the applicable regulations, policies, and guidelines relating to the proper management of cultural resources for the Project.

1.1.1 California Register of Historical Resources (California Public Resources Code, Section 5020 et seq.)

In California, the term "cultural resource" includes but is not limited to "any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California" (California Public Resources Code, Section 5020.1[j]). In 1992, the California legislature established the California Register of Historical Resources (CRHR) "to be used by state and local agencies, private groups, and citizens to identify the state's cultural resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change" (California Public Resources Code, Section 5024.1[a]). A resource is eligible for listing in the CRHR if the State Cultural Resources Commission determines that it is a significant resource and that it meets any of the following National Register of Historic Places (NRHP) criteria (California Public Resources Code, Section 5024.1[c]):

1. Associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
2. Associated with the lives of persons important in our past.

3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
4. Has yielded, or may be likely to yield, information important in prehistory or history.

Resources less than 50 years old are not considered for listing in the CRHR, but may be considered if it can be demonstrated that sufficient time has passed to understand the historical importance of the resource (see 14 CCR 4852[d][2]).

The CRHR protects cultural resources by requiring evaluations of the significance of prehistoric and historic resources. The criteria for the CRHR are nearly identical to those for the NRHP, and properties listed or formally designated as eligible for listing on the NRHP are automatically listed on the CRHR, as are the state landmarks and points of interest. The CRHR also includes properties designated under local ordinances or identified through local cultural resource surveys. The State Historic Preservation Officer maintains the CRHR.

1.1.2 Native American Historic Cultural Sites (California Public Resources Code, Section 5097 et seq.)

The Native American Historic Resources Protection Act (California Public Resources Code, Section 5097 et seq.) addresses the disposition of Native American burials in archaeological sites and protects such remains from disturbance, vandalism, or inadvertent destruction; establishes procedures to be implemented if Native American skeletal remains are discovered during construction of a project; and establishes the Native American Heritage Commission (NAHC) to resolve disputes regarding the disposition of such remains. In addition, the Native American Historic Resources Protection Act makes it a misdemeanor punishable by up to 1 year in jail to deface or destroy an Indian historic or cultural site that is listed or may be eligible for listing in the CRHR.

1.1.3 California Native American Graves Protection and Repatriation Act

The California Native American Graves Protection and Repatriation Act (California Repatriation Act), enacted in 2001, requires all state agencies and museums that receive state funding and that have possession or control over collections of human remains or cultural items, as defined, to complete an inventory and summary of these remains and items on or before January 1, 2003, with certain exceptions. The California Repatriation Act also provides a process for the identification and repatriation of these items to the appropriate tribes.

1.1.4 California Health and Safety Code Section 7050.5

California law protects Native American burials, skeletal remains, and associated grave goods, regardless of their antiquity, and provides for the sensitive treatment and disposition of those remains. California Health and Safety Code Section 7050.5 requires that if human remains are discovered in any place other than a dedicated cemetery, no further disturbance or excavation of the site or nearby area reasonably suspected to contain human remains shall occur until the county coroner has examined the remains (California Health and Safety Code Section 7050.5[b]). If the coroner determines or has reason to believe the remains are those of a Native American, the coroner must contact the NAHC within 24 hours (California Health and Safety Code Section 7050.5[c]). The NAHC will notify the most likely descendant. With the permission of the landowner, the most likely descendant may inspect the site of discovery. The inspection must be completed within 24 hours of notification of the most likely descendant

by the NAHC. The most likely descendant may recommend means of treating or disposing of, with appropriate dignity, the human remains and items associated with Native Americans.

1.1.5 California Environmental Quality Act

As described further below, the following CEQA Statute and Guidelines are relevant to the analysis of archaeological and historic resources:

1. California Public Resources Code, Section 21083.2(g) defines "unique archaeological resource."
2. California Public Resources Code, Section 21084.1, and CEQA Guidelines Section 15064.5(a) define cultural resources. In addition, CEQA Guidelines Section 15064.5(b) defines the phrase "substantial adverse change" in the significance of a cultural resource. It also defines the circumstances when a project would materially impair the significance of a cultural resource.
3. California Public Resources Code, Section 21074 (a), defines "Tribal cultural resources" and Section 21074(b) defines a "cultural landscape."
4. California Public Resources Code, Section 5097.98, and CEQA Guidelines Section 15064.5(e) set forth standards and steps to be employed following the accidental discovery of human remains in any location other than a dedicated ceremony.
5. California Public Resources Code, Sections 21083.2(b)-(c), and CEQA Guidelines Section 15126.4 provide information regarding the mitigation framework for archaeological and historic resources, including options of preservation-in-place mitigation measures; they identify preservation in place as the preferred manner of mitigating impacts to significant archaeological sites.

Under CEQA, a project may have a significant effect on the environment if it may cause "a substantial adverse change in the significance of an [sic] cultural resource" (California Public Resources Code, Section 21084.1; 14 CCR 15064.5[b]). A "cultural resource" is any site listed or eligible for listing in the CRHR. The CRHR listing criteria are intended to examine whether the resource in question: (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 possesses high artistic values; or (d) has yielded, or may be likely to yield, information important in pre-history or history.

The term "cultural resource" also includes any site described in a local register of historic resources or identified as significant in a cultural resources survey (meeting the requirements of California Public Resources Code, Section 5024.1[q]).

CEQA also applies to "unique archaeological resources." California Public Resources Code, Section 21083.2(g), defines a "unique archaeological resource" as any archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
2. Has a special and particular quality such as being the oldest of its type or the best available example of its type.
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person.

In 2014, CEQA was amended through Assembly Bill 52 to apply to "tribal culture resources" as well. Specifically, California Public Resources Code, Section 21074, provides guidance for defining tribal cultural resources as either of the following:

1. Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following: (A) Included or determined to be eligible for inclusion in the California Register of Cultural Resources. (B) Included in a local register of cultural resources as defined in subdivision (k) of §5020.1.
2. 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 §5024.1. In applying the criteria set forth in subdivision (c) of §5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe. (b) A cultural landscape that meets the criteria of subdivision (a) is a tribal cultural resource to the extent that the landscape is geographically defined in terms of the size and scope of the landscape.

All cultural resources and unique archaeological resources—as defined by statute—are presumed to be historically or culturally significant for purposes of CEQA (California Public Resources Code, Section 21084.1; 14 CCR 15064.5[a]). The lead agency is not precluded from determining that a resource is a cultural resource even if it does not fall within this presumption (California Public Resources Code, Section 21084.1; 14 CCR 15064.5[a]). A site or resource that does not meet the definition of "cultural resource" or "unique archaeological resource" is not considered significant under CEQA and need not be analyzed further (California Public Resources Code, Section 21083.2(a); 14 CCR 15064.5[c][4]).

Under CEQA a significant cultural impact results from a "substantial adverse change in the significance of an [sic] cultural resource," including a unique archaeological resource, due to the "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an cultural resource would be materially impaired" (14 CCR 15064.5[b][1]; California Public Resources Code, Section 5020.1[q]). In turn, according to CEQA Guidelines Section 15064.5(b)(2), the significance of a cultural resource is materially impaired when a project:

1. Demolishes or materially alters in an adverse manner those physical characteristics of an cultural resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register; or
2. Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of cultural resources pursuant to Section 5020.1(k) of the Public Resources Code or its identification in an cultural resources survey meeting the requirements of Section 5024.1(g) of the Public Resources Code, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or
3. Demolishes or materially alters in an adverse manner those physical characteristics of a cultural resource that convey its historical significance and that justify its eligibility for inclusion in the California Register as determined by a lead agency for purposes of CEQA.

Pursuant to these sections, CEQA first evaluates whether a project site contains any "cultural resources," then assesses whether that project will cause a substantial adverse change in the significance of a cultural resource such that the resource's historical significance is materially impaired.

When a project significantly affects a unique archaeological resource, CEQA imposes special mitigation requirements. Specifically, California Public Resources Code, Sections 21083.2(b)(1)–21083.2(b)(4), states:

> If it can be demonstrated that a project will cause damage to a unique archaeological resource, the lead agency may require reasonable efforts to be made to permit any or all of these resources to be preserved in place or left in an undisturbed state. Examples of that treatment, in no order of preference, may include, but are not limited to, any of the following:
>
> 1. Planning construction to avoid archaeological sites.
> 2. Deeding archaeological sites into permanent conservation easements.
> 3. Capping or covering archaeological sites with a layer of soil before building on the sites.
> 4. Planning parks, greenspace, or other open space to incorporate archaeological sites.

If these preservation-in-place options are not feasible, mitigation may be accomplished through data recovery (California Public Resources Code, Section 21083.2(d); 14 CCR 15126.4[b][3][C]). California Public Resources Code, Section 21083.2(d), states that:

> Excavation as mitigation shall be restricted to those parts of the unique archaeological resource that would be damaged or destroyed by the project. Excavation as mitigation shall not be required for a unique archaeological resource if the lead agency determines that testing or studies already completed have adequately recovered the scientifically consequential information from and about the resource, if this determination is documented in the environmental impact report.

These same requirements are set forth in slightly greater detail in CEQA Guidelines Section 15126.4(b)(3), as follows:

> A. Preservation in place is the preferred manner of mitigating impacts to archaeological sites. Preservation in place maintains the relationship between artifacts and the archaeological context. Preservation may also avoid conflict with religious or cultural values of groups associated with the site.
> B. Preservation in place may be accomplished by, but is not limited to, the following:
> 1. Planning construction to avoid archaeological sites;
> 2. Incorporation of sites within parks, greenspace, or other open space;
> 3. Covering the archaeological sites with a layer of chemically stable soil before building tennis courts, parking lots, or similar facilities on the site[; and]
> 4. Deeding the site into a permanent conservation easement.
> C. When data recovery through excavation is the only feasible mitigation, a data recovery plan, which makes provision for adequately recovering the scientifically consequential information from and about the cultural resource, shall be prepared and adopted prior to any excavation being undertaken.

Note that, when conducting data recovery, "if an artifact must be removed during project excavation or testing, curation may be an appropriate mitigation" (14 CCR 15126.4[b][3]). However, "data recovery shall not be required for an cultural resource if the lead agency determines that testing or studies already completed have adequately recovered the scientifically consequential information from and about the archaeological or historic resource, provided that determination is documented in the EIR and that the studies are deposited with the California Cultural resources Regional Information Center" (14 CCR 15126.4[b][3][D]).

Finally, CEQA Guidelines Section 15064.5 assigns special importance to human remains and specifies procedures to be used when Native American remains are discovered. These procedures are set forth in California Public Resources Code, Section 5097.98.

1.1.6 Solana Beach Municipal Code

Section 17.60.160 of the City of Solana Beach Municipal Code establishes a procedure for the designation and protection of historic, cultural, archaeological, or architectural landmarks. According to this section, "no building or grading permit shall be issued for the construction or alteration of any building or structure, or site (nor shall any person construct or alter a building, structure, or site), which has a historic/cultural landmark designator applied to the building, structure, or site until a development review permit has been submitted and approved in accordance with Municipal Code 17.68.04011." Additionally, the development review criterion is generally "that the proposed construction, alteration, demolition, or relocation of any building, structure, or site shall enhance, to the maximum extent feasible, and not interfere with, detract from or degrade the historic, cultural, architectural or archaeological resource values of the designated historic/cultural landmark." The procedures identified in this section of the Municipal Code are intended to provide for the long-term continued preservation of such designated historic/cultural landmark properties.

Section 17.68.040 of the Municipal Code establishes requirements for development review permits. These regulations provide for the review of certain classes of development projects which, due to their scale, proximity to environmentally sensitive resource areas, or unique design features as permitted by a zone or specific plan, require special discretionary consideration to ensure consistency with the General Plan and the intent of the zone in which the property is located. Of note, these regulations state that any site development (including grading for any purpose) or construction (including any structural additions to existing development) that involves an aggregate of more than 50 cubic yards of cut and/or fill is subject to this discretionary permit, which requires review under CEQA.

1.1.7 General Plan Conservation and Open Space Element

This element from the adopted General Plan identifies the importance of preserving archaeological, historical, and paleontological resources (City of Solana Beach 2010). Although the California Government Code did not require consideration of cultural resources in general plans in 2010 when the General Plan was drafted, the City chose to include such considerations in the general plan because of their inherent importance to the community. The adopted General Plan included several policies related to the preservation of these resources, including the following:

> Policy 6.b: The City shall require that sites proposed for future development are to be evaluated by certified archaeologists and/or paleontologists in accordance with CEQA. Where potentially significant adverse impacts are identified, the City shall require appropriate mitigation measures such as in situ preservation or professional retrieval.
>
> Policy 6.d: The City shall encourage and support the acquisition of significant cultural resources by private and/or public entities interested in preserving such resources.
>
> Policy 6.e: The City shall establish a historic preservation section within its zoning ordinance.

1.1.8 Coastal Program Land Use Plan

The Project APE is located within the Coastal Zone and subject to compliance with the California Coastal Act. As required by the California Coastal Commission, Land Use Plans are planning documents prepared by cities and counties for areas within the coastal zone to assure compliance with the California Coastal Act of 1976. The California Coastal Act is intended to ensure that the coastal areas of California are utilized and/or developed in a manner responsive to statewide public objectives. The City's approved Local Coastal Program Land Use Plan contains key strategies and policies to provide comprehensive citywide land use planning, sustainable development, and shoreline protection policies focused on local conditions, goals and interests.

The City's Local Coastal Program Land Use Plan contains several policies pertaining to new development to provide for the protection and preservation of both known (mapped) as well as potential undiscovered cultural resources (archaeological, paleontological, and historical) within the City, such as providing monitoring if potential resources exist on site.

1.2 Project Personnel

Micah Hale, PhD, RPA, served as principal investigator. Matthew DeCarlo, MA, served as project manager and field director, and co-authored this technical report (see Appendix A, Project Personnel Qualifications). Martin Padilla from Red Tail Environmental participated in the survey as Native American monitor.

1.3 Report Structure

Following this introduction, an environmental and cultural context is provided for characterizing cultural resources. Next, survey methods are reviewed. The results of the survey is then followed by management considerations. Two sets of appendices (confidential and non-confidential) are attached. The non-confidential appendices include Appendix A and Appendix C, NAHC Sacred Lands File Search and Tribal Correspondence. The confidential appendix is Appendix B, Records Search Documents.

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SOURCE: USGS 7.5-Minute Series Del Mar Quadrangle

DUDEK

0 1,000 2,000 Feet

FIGURE 1

Project Location

Ida Avenue Project

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SOURCE: SANDAG 2017

DUDEK

0 35 70 Feet

FIGURE 2

Area of Potential Effect

Ida Avenue Project

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2 Setting

2.1 Natural Setting

The Project APE is located atop a slope leading down to the coastline. It is located north of the San Dieguito Valley. The APE's elevation is approximately 110 feet above mean sea level. The periphery of the lot shows signs of earth movement from the construction of I-5, Ida Avenue, and the surrounding residential development. Grasses and ice plant (*Mesembryanthemum* sp.) cover the majority of the ground surface.

For detailed discussion relating to the environmental context of this area, please consult the biological technical study prepared for the Project.

2.2 Cultural Setting

Evidence for continuous human occupation in the San Diego region spans the last 10,000 years. Various attempts to parse out variability in archaeological assemblages over this broad time frame have led to the development of several cultural chronologies; some of these are based on geologic time, most are based on temporal trends in archaeological assemblages, and others are interpretive reconstructions. Each of these reconstructions describes essentially similar trends in assemblage composition in more or less detail. This research employs a common set of generalized terms used to describe chronological trends in assemblage composition: Paleoindian (pre-5500 BC), Archaic (8000 BC–AD 500), Late Prehistoric (AD 500–1769), and Ethnohistoric (post-AD 1769).

2.2.1 Paleoindian (pre-5500 BC)

Evidence for Paleoindian occupation in coastal Southern California is tenuous, especially considering the fact that the oldest dated archaeological assemblages look nothing like the Paleoindian artifacts from the Great Basin. One of the earliest dated archaeological assemblages in coastal Southern California (excluding the Channel Islands) derives from SDI-4669/W-12, in La Jolla. A human burial from SDI-4669 was radiocarbon dated to 9,590–9,920 years before present (95.4% probability) (Hector 2007). The burial is part of a larger site complex that contained more than 29 human burials associated with an assemblage that fits the Archaic profile (i.e., large amounts of groundstone, battered cobbles, and expedient flake tools). In contrast, typical Paleoindian assemblages include large stemmed projectile points, high proportions of formal lithic tools, bifacial lithic reduction strategies, and relatively small proportions of groundstone tools. Prime examples of this pattern are sites that were studied by Emma Lou Davis (1978) on China Lake Naval Air Weapons Station near Ridgecrest, California. These sites contained fluted and unfluted stemmed points and large numbers of formal flake tools (e.g., shaped scrapers, blades). Other typical Paleoindian sites include the Komodo site (MNO-679), a multicomponent fluted point site, and MNO-680, a single component Great Basined Stemmed point site (Basgall et al. 2002). At MNO-679 and MNO-680, groundstone tools were rare while finely made projectile points were common.

Turning back to coastal Southern California, the fact that some of the earliest dated assemblages are dominated by processing tools runs counter to traditional notions of mobile hunter–gatherers traversing the landscape for highly valued prey. Evidence for the latter—that is, typical Paleoindian assemblages—may have been located along the coastal margin at one time, prior to glacial desiccation and a rapid rise in sea level during the early Holocene (pre-

7500 BP) that submerged as much as 1.8 km of the San Diego coastline. If this were true, however, it would also be expected that such sites would be located on older landforms near the current coastline. Some sites, such as SDI-210 along Agua Hedionda Lagoon, contained stemmed points similar in form to Silver Lake and Lake Mojave projectile points (pre-8000 BP) that are commonly found at sites in California's high desert (Basgall and Hall 1990). SDI-210 yielded one corrected radiocarbon date of 8520–9520 BP (Warren et al. 2004). However, sites of this nature are extremely rare and cannot be separated from large numbers of milling tools that intermingle with old projectile point forms.

Warren et al. (2004) claimed that a biface manufacturing tradition present at the Harris site complex (SDI-149) is representative of typical Paleoindian occupation in the San Diego region that possibly dates between 10,365 and 8200 BC. Termed San Dieguito (Rogers 1945), assemblages at the Harris site are qualitatively distinct from most others in the San Diego region because the site has large numbers of finely made bifaces (including projectile points), formal flake tools, a biface reduction trajectory, and relatively small amounts of processing tools (Warren 1964, 1968). Despite the unique assemblage composition, the definition of San Dieguito as a separate cultural tradition is hotly debated. Gallegos (1987) suggested that the San Dieguito pattern is simply an inland manifestation of a broader economic pattern. Gallegos' interpretation of San Dieguito has been widely accepted in recent years, in part because of the difficulty in distinguishing San Dieguito components from other assemblage constituents. In other words, it is easier to ignore San Dieguito as a distinct socioeconomic pattern than it is to draw it out of mixed assemblages.

The large number of finished bifaces (i.e., projectile points and non-projectile blades), along with large numbers of formal flake tools at the Harris site complex, is very different than nearly all other assemblages throughout the San Diego region, regardless of age. Warren et al. (2004) made this point, tabulating basic assemblage constituents for key early Holocene sites. Producing finely made bifaces and formal flake tools implies that relatively large amounts of time were spent for tool manufacture. Such a strategy contrasts with the expedient flake-based tools and cobble-core reduction strategy that typifies non-San Dieguito Archaic sites. It can be inferred from the uniquely high degree of San Dieguito assemblage formality that the Harris site complex represents a distinct economic strategy from non-San Dieguito assemblages.

If San Dieguito truly represents a distinct socioeconomic strategy from the non-San Dieguito Archaic processing regime, its rarity implies that it was not only short-lived, but that it was not as economically successful as the Archaic strategy. Such a conclusion would fit with other trends in Southern California deserts, wherein hunting-related tools are replaced by processing tools during the early Holocene (Basgall and Hall 1990).

2.2.2 Archaic (8000 BC–AD 500)

The more than 1500-year overlap between the presumed age of Paleoindian occupations and the Archaic period highlights the difficulty in defining a cultural chronology in the San Diego region. If San Dieguito is the only recognized Paleoindian component in the San Diego region, then the dominance of hunting tools implies that it derives from Great Basin adaptive strategies and is not necessarily a local adaptation. Warren et al. (2004) admitted as much, citing strong desert connections with San Dieguito. Thus, the Archaic pattern is the earliest local socioeconomic adaptation in the San Diego region (Hale 2001, 2009).

The Archaic pattern is relatively easy to define with assemblages that consist primarily of processing tools: millingstones, handstones, battered cobbles, heavy crude scrapers, incipient flake-based tools, and cobble-core reduction. These assemblages occur in all environments across the San Diego region, with little variability in tool composition. Low assemblage variability over time and space among Archaic sites has been equated with cultural

conservatism (Byrd and Reddy 2002; Warren 1968; Warren et al. 2004). Despite enormous amounts of archaeological work at Archaic sites, little change in assemblage composition occurs until the bow and arrow and ceramics are adopted at around AD 500 (Griset 1996; Hale 2009). Even then, assemblage formality remains low. After the bow is adopted, small arrow points appear in large quantities and already low amounts of formal flake tools are replaced by increasing amounts of expedient flake tools. Similarly, shaped millingstones and handstones decrease in proportion relative to expedient, unshaped groundstone tools (Hale 2009). Thus, the terminus of the Archaic period is equally as hard to define as its beginning because basic assemblage constituents and patterns of manufacturing investment remain stable, complimented only by the addition of the bow and ceramics.

2.2.3 Late Prehistoric (AD 500–1769)

The period of time following the Archaic and prior to Ethnohistoric times (AD 1769) is commonly referred to as the Late Prehistoric (Rogers 1945; Wallace 1955; Warren et al. 2004). However, several other subdivisions continue to be used to describe various shifts in assemblage composition, including the addition of ceramics and cremation practices. In northern San Diego County, the post-AD 1450 period is called the San Luis Rey Complex (True 1980), while the same period in southern San Diego County is called the Cuyamaca Complex and is thought to extend from AD 500 until Ethnohistoric times (Meighan 1959). Rogers (1929) also subdivided the last 1,000 years into the Yuman II and III cultures, based on the distribution of ceramics. Despite these regional complexes, each is defined by the addition of arrow points and ceramics and the widespread use of bedrock mortars. Vagaries in the appearance of the bow and arrow and ceramics make the temporal resolution of the San Luis Rey and Cuyamaca complexes difficult. For this reason, the term Late Prehistoric is well-suited to describe the last 1,500 years of prehistory in the San Diego region.

Temporal trends in socioeconomic adaptations during the Late Prehistoric period are poorly understood. This is partly due to the fact that the fundamental Late Prehistoric assemblage is very similar to the Archaic pattern, but includes arrow points and large quantities of fine debitage from producing arrow points, ceramics, and cremations. The appearance of mortars and pestles is difficult to place in time because most mortars are on bedrock surfaces; bowl mortars are actually rare in the San Diego region. Some argue that the Ethnohistoric intensive acorn economy extends as far back as AD 500 (Bean and Shipek 1978). However, there is no substantial evidence that reliance on acorns, and the accompanying use of mortars and pestles, occurred prior to AD 1400. True (1980) argued that acorn processing and ceramic use in the northern San Diego region did not occur until the San Luis Rey pattern emerged after approximately AD 1450. For southern San Diego County, the picture is less clear. The Cuyamaca Complex is the southern counterpart to the San Luis Rey pattern, however, and is most recognizable after AD 1450 (Hector 1984). Similar to True (1980), Hale (2009) argued that an acorn economy did not appear in the southern San Diego region until just prior to Ethnohistoric times, and that when it did occur, a major shift in social organization followed.

2.2.4 Ethnohistoric (post-AD 1769)

The history of the Native American communities prior to the mid-1700s has largely been reconstructed through later mission-period and early ethnographic accounts. The first records of the Native American inhabitants of the San Diego region come predominantly from European merchants, missionaries, military personnel, and explorers. These brief, and generally peripheral, accounts were prepared with the intent of furthering respective colonial and economic aims and were combined with observations of the landscape. They were not intended to be unbiased accounts regarding the cultural structures and community practices of the newly encountered cultural groups. The establishment of the missions in the San Diego region brought more extensive documentation of Native American

communities, though these groups did not become the focus of formal and in-depth ethnographic study until the early twentieth century (Boscana 1846; Fages 1937; Geiger and Meighan 1976; Harrington 1934; Laylander 2000). The principal intent of these researchers was to record the precontact, culturally specific practices, ideologies, and languages that had survived the destabilizing effects of missionization and colonialism. This research, often understood as "salvage ethnography," was driven by the understanding that traditional knowledge was being lost due to the impacts of modernization and cultural assimilation. Alfred Kroeber applied his "memory culture" approach (Lightfoot 2005, p. 32) by recording languages and oral histories within the San Diego region. Kroeber's 1925 assessment of the impacts of Spanish missionization on local Native American populations supported Kumeyaay traditional cultural continuity (p. 711):

> San Diego was the first mission founded in upper California; but the geographical limits of its influence were the narrowest of any, and its effects on the natives comparatively light. There seem to be two reasons for this: first, the stubbornly resisting temper of the natives; and second, a failure of the rigorous concentration policy enforced elsewhere.

In some ways this interpretation led to the belief that many California Native American groups simply escaped the harmful effects of contact and colonization all together. This, of course, is untrue. Ethnographic research by Dubois, Kroeber, Harrington, Spier, and others during the early twentieth century seemed to indicate that traditional cultural practices and beliefs survived among local Native American communities. These accounts supported, and were supported by, previous governmental decisions which made San Diego County the location of more federally recognized tribes than anywhere else in the United States: 18 tribes on 18 reservations that cover more than 116,000 acres (CSP 2009).

The traditional cultural boundaries between the Luiseño and Kumeyaay Native American tribal groups have been well defined by anthropologist Florence C. Shipek (Shipek 1991, as summarized in County of San Diego 2007, p. 6):

> In 1769, the Kumeyaay national territory started at the coast about 100 miles south of the Mexican border (below Santo Tomas), thence north to the coast at the drainage divide south of the San Luis Rey River including its tributaries. Using the U.S. Geological Survey topographic maps, the boundary with the Luiseño then follows that divide inland. The boundary continues on the divide separating Valley Center from Escondido and then up along Bear Ridge to the 2240 contour line and then north across the divide between Valley Center and Woods Valley up to the 1880-foot peak, then curving around east along the divide above Woods Valley.

Based on ethnographic information, it is believed that at least 88 different languages were spoken from Baja California Sur to the southern Oregon state border at the time of Spanish contact (Johnson and Lorenz 2006). The distribution of recorded Native American languages has been dispersed as a geographic mosaic across California through six primary language families (Golla 2007). Based on the project location, the Native American inhabitants of the region would have likely spoken both the Ipai and Tipai language subgroups of the Yuman language group. Ipai and Tipai, spoken respectively by the northern and southern Kumeyaay communities, are mutually intelligible. For this reason, these two are often treated as dialects of a larger Kumeyaay tribal group rather than as distinctive languages, though this has been debated (Luomala 1978; Laylander 2010).

Victor Golla has contended that one can interpret the amount of variability within specific language groups as being associated with the relative "time depth" of the speaking populations (Golla 2007, p. 80) A large amount of variation within the language of a group represents a greater time depth than does a language with less internal diversity. One method that he has employed is drawing comparisons with historically documented changes in Germanic and Romantic language groups. Golla has observed that the "absolute chronology of the internal diversification within a language family" can be correlated with archaeological dates (Golla 2007, p. 71). This type of interpretation is modeled on concepts of genetic drift and gene flows that are associated with migration and population isolation in the biological sciences.

Golla suggested that there are two language families associated with Native American groups who traditionally lived throughout the San Diego County region. The northern San Diego tribes have traditionally spoken Takic languages that may be assigned to the larger Uto–Aztecan family (Golla 2007). These groups include the Luiseño, Cupeño, and Cahuilla. Golla has interpreted the amount of internal diversity within these language-speaking communities to reflect a time depth of approximately 2,000 years. Other researchers have contended that Takic may have diverged from Uto–Aztecan circa 2600 BC–AD 1, which was later followed by the diversification within the Takic speaking San Diego tribes, occurring approximately 1500 BC–AD 1000 (Laylander 2010). The majority of Native American tribal groups in southern San Diego region have traditionally spoken Yuman languages, a subgroup of the Hokan Phylum. Golla has suggested that the time depth of Hokan is approximately 8,000 years (Golla 2007). The Kumeyaay tribal communities share a common language group with the Cocopa, Quechan, Maricopa, Mojave, and others to east, and the Kiliwa to the south. The time depth for both the Ipai (north of the San Diego River, from Escondido to Lake Henshaw) and the Tipai (south of the San Diego River, the Laguna Mountains through Ensenada) is approximated to be 2,000 years at the most. Laylander has contended that previous research indicates a divergence between Ipai and Tipai to have occurred approximately AD 600–1200 (Laylander 1985). Despite the distinct linguistic differences between the Takic-speaking tribes to the north, the Ipai-speaking communities in central San Diego, and the Tipai southern Kumeyaay, attempts to illustrate the distinctions between these groups based solely on cultural material alone have had only limited success (Pigniolo 2004; True 1966).

The Kumeyaay generally lived in smaller family subgroups that would inhabit two or more locations over the course of the year. While less common, there is sufficient evidence that there were also permanently occupied villages, and that some members may have remained at these locations throughout the year (Owen 1965; Shipek 1982, 1985; Spier 1923). Each autonomous triblet was internally socially stratified, commonly including higher-status individuals such as a tribal head (Kwaaypay), shaman (Kuseyaay), and general members with various responsibilities and skills (Shipek 1982). Higher-status individuals tended to have greater rights to land resources and owned more goods, such as shell money and beads, decorative items, and clothing. To some degree, titles were passed along family lines; however, tangible goods were generally ceremonially burned or destroyed following the deaths of their owners (Luomala 1978). Remains were cremated over a pyre and then relocated to a cremation ceramic vessel that was placed in a removed or hidden location. A broken metate was commonly placed at the location of the cremated remains, with the intent of providing aid and further use after death. At maturity, tribal members often left to other bands in order to find a partner. The families formed networks of communication and exchange around such partnerships.

Areas or regions, identified by known physical landmarks, could be recognized as band-specific territories that might be violently defended against use by other members of the Kumeyaay. Other areas or resources, such as water sources and other locations that were rich in natural resources, were generally understood as communal land to be shared amongst all the Kumeyaay (Luomala 1978). The coastal Kumeyaay exchanged a number of local goods, such as seafood, coastal plants, and various types of shell for items including acorns, agave, mesquite beans, gourds, and other more interior plants of use (Luomala 1978). Shellfish would have been procured from three primary

environments, including the sandy open coast, bay and lagoon, and rocky open coast. The availability of these marine resources changed with the rising sea levels, siltation of lagoon and bay environments, changing climatic conditions, and intensity of use by humans and animals (Gallegos and Kyle 1988; Pigniolo 2005; Warren 1964). Shellfish from sandy environments included *Donax*, *Saxidomus*, *Tivela*, and others. Rocky coast shellfish dietary contributions consisted of *Pseudochama*, *Megastraea*, *Saxidomus*, *Protothaca*, *Megathura*, *Mytilus*, and others. Lastly, the bay environment would have provided *Argopecten*, *Chione*, *Ostrea*, *Neverita*, *Macoma*, *Tagelus*, and others. Although marine resources were obviously consumed, terrestrial animals and other resources likely provided a large portion of sustenance. Game animals consisted of rabbits, hares (*Leporidae*), birds, ground squirrels, woodrats (*Neotoma* sp.), deer, bears, mountain lions (*Puma concolor*), bobcats (*Lynx rufus*), coyotes (*Canis latrans*), and others. In lesser numbers, reptiles and amphibians may have been consumed.

A number of local plants were used for food and medicine. These were exploited seasonally, and were both traded between regional groups and gathered as a single triblet moved between habitation areas. Some of the more common of these that might have been procured locally or as higher elevation varieties would have included buckwheat (*Eriogonum fasciculatum*), *Agave*, *Yucca*, lemonade sumac (*Rhus integrifolia*), sugarbush (*Rhus ovata*), sage scrub (*Artemisia californica*), yerba santa (*Eriodictyon* sp.), sage (*Salvia* sp.), *Ephedra*, prickly pear (*Opuntia* sp.), mulefat (*Baccharis salicifolia*), chamise (*Adenostoma fasciculatum*), elderberry (*Sambucus nigra*), oak (*Quercus* sp.), willow (*Salix* sp.), and *Juncus* grass among many others (Wilken 2012).

2.2.5 Historic Period (post-AD 1542)

San Diego history can be divided into the Spanish Period (1769–1821), Mexican Period (1821–1846) and American Period (1846–Present). European activity in the region began as early as AD 1542, when Juan Rodríguez Cabrillo landed in San Diego Bay. Sebastián Vizcaíno returned in 1602, and it is possible that there were subsequent contacts that went unrecorded. These brief encounters made the local native people aware of the existence of other cultures that were technologically more complex than their own. Epidemic diseases may also have been introduced into the region at an early date, either by direct contacts with the infrequent European visitors or through waves of diffusion emanating from native peoples farther to the east or south (Preston 2002). It is possible, but as yet unproven, that the precipitous demographic decline of native peoples had already begun prior to the arrival of Gaspar de Portolá and Junípero Serra in 1769.

The Spanish colonization of Alta California began in 1769 with the founding of Mission San Diego de Alcalá by Father Junípero Serra. Concerns over Russian and English interests in California motivated the Spanish government to send an expedition of soldiers, settlers, and missionaries to occupy and secure the northwestern borderlands of New Spain through the establishment of a presidio, mission, and pueblo. The Spanish explorers first camped on the shore of the bay in the area that is now downtown San Diego. Lack of water at this location, however, led to moving the camp on May 14, 1769, to a small hill closer to the San Diego River and near the Kumeyaay village of Cosoy. Father Junípero Serra arrived in July of the same year to find the Presidio serving mostly as a hospital. The Spanish built a primitive mission and presidio structure on the hill near the river.

Bad feelings soon developed between the native Kumeyaay and the soldiers, resulting in construction of a stockade which, by 1772, included barracks for the soldiers, a storehouse for supplies, a house for the missionaries, and the chapel, which had been improved. The log and brush huts were gradually replaced with buildings made of adobe bricks. Flat earthen roofs were eventually replaced by pitched roofs with rounded roof tiles. Clay floors were eventually lined with fired brick.

In August 1774 the Spanish missionaries moved the Mission San Diego de Alcalá to its present location 6 miles up the San Diego River valley (modern Mission Valley) near the Kumeyaay village of Nipaguay. Begun as a thatched chapel and compound built of willow poles, logs, and tules, the new Mission was sacked and burned in the Kumeyaay uprising of November 5, 1775. The first adobe chapel was completed in October 1776 and the present church was begun the following year. A succession of building programs through 1813 resulted in the final rectilinear plan that included the church, bell tower, sacristy, courtyard, residential complex, workshops, corrals, gardens, and cemetery. Orchards, reservoirs, and other agricultural installations were built to the south on the lower San Diego River alluvial terrace and were irrigated by a dam and aqueduct system. The initial Spanish occupation and mission system brought about profound changes in the lives of the Kumeyaay people. Substantial numbers of the coastal Kumeyaay were forcibly brought into the mission or died from introduced diseases.

As early as 1791, presidio commandants in California were given the authority to grant small house lots and garden plots to soldiers and their families, and sometime after 1800, soldiers and their families began to move down the hill near the San Diego River. Historian William Smythe noted that Don Blas Aguilar, who was born in 1811, remembered at least 15 such grants below Presidio Hill by 1821; five of these grant lands, within the boundaries of what would become Old Town, had houses in 1821. These included the home of the retired commandant Francisco Ruiz Adobe (now known as the Carrillo Adobe), another building later owned by Henry Fitch on Calhoun Street, the Ybanes and Serrano houses on Juan Street near Washington Street, and a small adobe house on the main plaza owned by Juan Jose Maria Marron.

In 1822 the political situation changed as Mexico won its independence from Spain and San Diego became part of the Mexican Republic. The Mexican Government opened California to foreign trade; began issuing private land grants in the early 1820s, creating the rancho system of large agricultural estates; secularized the Spanish missions in 1833; and oversaw the rise of the civilian pueblo. By 1827, as many as 30 homes existed around the central plaza and in 1835, Mexico granted San Diego official pueblo (town) status. At this time the town had a population of nearly 500 residents, later reaching a peak of roughly 600. By 1835 the presidio, once the center of life in Spanish San Diego, had been abandoned and lay in ruins. Mission San Diego de Alcalá fared little better. The town and the ship landing area at La Playa were now the centers of activity in Mexican San Diego. However, the new Pueblo of San Diego did not prosper as did some other California towns during the Mexican Period.

The secularization in San Diego County triggered increased Native American hostilities against the Californios during the late 1830s. The attacks on outlying ranchos, along with unstable political and economic factors, helped San Diego's population decline to around 150 permanent residents by 1840. San Diego's official Pueblo status was removed by 1838 and it was made a subprefecture of the Los Angeles Pueblo. When the Americans took over after 1846, the situation had stabilized somewhat, and the population had increased to roughly 350 non-Native American residents. The Native American population continued to decline, as Mexican occupation brought about continued displacement and acculturation of Native American populations.

The American Period began in 1846 when United States military forces occupied San Diego, and this period continues today. When United States military forces occupied San Diego in July 1846, the town's residents split on their course of action. Many of the town's leaders sided with the Americans, while other prominent families opposed the United States invasion. In December 1846, a group of Californios under Andres Pico engaged United States Army forces under General Stephen Kearney at the Battle of San Pasqual and inflicted many casualties. However, the Californio resistance was defeated in two small battles near Los Angeles and effectively ended by January 1847. The Americans assumed formal control with the Treaty of Guadalupe-Hidalgo in 1848 and introduced Anglo culture and society, American political institutions, and especially American entrepreneurial commerce. In 1850, the Americanization of San Diego began to develop rapidly.

On February 18, 1850, the California State Legislature formally organized San Diego County. The first elections were held at San Diego and La Playa on April 1, 1850, for county officers. San Diego grew slowly during the next decade. San Diegans attempted to develop the town's interests through a transcontinental railroad plan and the development of a new town closer to the bay. The failure of these plans, in addition to a severe drought that crippled ranching and the onset of the Civil War, left San Diego as a remote frontier town. The troubles led to a drop in the town's population from 650 in 1850 to 539 in 1860. Not until land speculator and developer Alonzo Horton arrived in 1867 did San Diego begin to develop fully into an active American town.

The Solana Beach area was originally settled around 1908 by George Jones. The area encompassing Solana Beach began to develop rapidly when Lake Hodges Dam was built in 1918. The creation of the 12,000-acre Santa Fe Irrigation District in 1918 led the way for the area from Rancho Santa Fe through Solana Beach to prosper and expand. The coastline from Solana Beach to Oceanside began to boom in the early 1920s. In 1922 Colonel Ed Fletcher, an early community leader and developer, purchased 201 acres at $200 per acre from Jones to develop the town of Solana Beach. Fletcher's goal was for his new community to be the regional commercial center for Del Mar, Rancho Santa Fe, and Solana Beach. The goal was never realized, because the former two communities overturned the original severe restrictions imposed on commercial development and allowed commercial activities within those towns. Nevertheless Solana Beach grew rapidly, paralleling the development of the entire county during the 1924–1929 period. On March 5, 1923, Fletcher filed the original subdivision map of Solana Beach. The community has since grown from an agricultural community to a highly developed urban area. Solana Beach was officially incorporated in 1986 and included the area of La Colonia de Eden Gardens.

2.3 South Coastal Information Center Records Search

An examination of existing maps, records, and reports was conducted by Dudek to determine if the Project could potentially impact previously recorded cultural resources. Dudek conducted a records search on January 22, 2020, at the South Coastal Information Center (SCIC) at San Diego State University. The search encompassed the APE and a 1-mile buffer around the APE. The purpose of the records search is to identify any previously recorded resources that may be located in or adjacent to the Project site and to identify previous studies in the Project vicinity. In addition to a review of previously prepared site records and reports, the records search also reviewed historical maps of the Project area, ethnographies, the NRHP, the CRHR, the California Historic Property Data File, and the lists of California State Historical Landmarks, California Points of Historical Interest, and Archaeological Determinations of Eligibility.

The records search identified 33 cultural resources within 1 mile of the APE, but none of these resources are located within the APE (see Table 1). The nearest resource, P-37-013484/CA-SDI-13484, is located immediately south of the Project APE. The resource was identified as a light marine shell scatter. The site was archaeologically tested in 2003 and the test units identified shell and "trace amounts of ground stone and flaked lithic debitage" to depths of 80 centimeters. Since the archaeological testing in 2003, a house was built over the northern portion of the resource, immediately south of the Project APE.

The records search also identified 81 previous archaeological studies that have been conducted within 1 mile of the APE (see Table 2 in Confidential Appendix B). Of the 81 studies, 10 studies cover portions of the APE, largely associated with work on I-5. One study, SD-9362, includes the archaeological evaluation of P-37-013484/CA-SDI-13484, which is immediately south of the Project APE. The archaeological testing found that the site contained "relatively meager cultural residues, with little diversity." The archaeologists recommended that the site contained no more research potential.

Table 1. Cultural Resources within 1 Mile of the Area of Potential Effect

Label	Trinomial	Era	Description	Intersects
850 VERA ST		Historical	Historic Address	No
880 STEVENS AV		Historical	Historic Address	No
P-37-000191	CA-SDI-191	Prehistoric	Habitation debris	No
P-37-004351	CA-SDI-4351	Prehistoric	Lithic scatter	No
P-37-004352	CA-SDI-4352	Prehistoric	Habitation debris	No
P-37-005957	CA-SDI-5957	Prehistoric	Habitation site	No
P-37-007287	CA-SDI-7287	Prehistoric	Artifact and shell scatter	No
P-37-007288	CA-SDI-7288	Prehistoric	Lithic scraper	No
P-37-007289	CA-SDI-7289	Prehistoric	Lithic and shell scatter	No
P-37-007979	CA-SDI-7979	Prehistoric	Artifact and shell scatter	No
P-37-010238	CA-SDI-10238	Prehistoric	Habitation site	No
P-37-013484	CA-SDI-13484	Prehistoric	Marine shell scatter	No
P-37-013506	CA-SDI-13506	Historical	Lumber yard foundations	No
P-37-013507	CA-SDI-13507	Historical	Lumber yard foundations	No
P-37-016324	CA-SDI-14795	Prehistoric	Shell midden	No
P-37-016569	CA-SDI-16697	Prehistoric	Shell scatter	No
P-37-016571		Prehistoric	Isolated shell	No
P-37-016572		Prehistoric	Isolated shell	No
P-37-018807	CA-SDI-15885	Prehistoric	Marine shell scatter	No
P-37-026494	CA-SDI-17390	Prehistoric	Artifact and shell scatter	No
P-37-029051	CA-SDI-18609	Prehistoric	Lithic flakes, ceramic, and shell scatter	No
P-37-034886		Historical	Outdoor stone features	No
P-37-035855		Historical	Commercial building	No
P-37-035935		Historical	Del Mar Infield Pavilion	No
P-37-035936		Historical	Del Mar Thoroughbred Club	No
P-37-036415		Historical	Electrical transmission line	No
P-37-036418		Historical	Del Mar Substation	No
P-37-036424		Prehistoric	Isolated volcanic flake	No
P-37-036425		Prehistoric	Isolated ceramic sherd	No
P-37-036426		Prehistoric	Isolated two shell fragments	No
P-37-036525		Historical	Isolated glass bottle fragment	No
P-37-036605		Prehistoric	Isolated mano	No
P-37-036765	CA-SDI-22193	Prehistoric	Shell midden	No

2.4 Historic Aerial Photograph Analysis

In addition to the SCIC records search, Dudek conducted an online review of historic aerial images of the Project APE and general vicinity, to help determine past development and land use of the Project APE. The historic aerial imagery available from the website HistoricAerials.com by Nationwide Environmental Title Research LLC includes maps from 1953 to 2016 (NETR 2020). Aerial photograph from 1953 shows that the APE was undeveloped but adjacent to a dirt road that follows the same trajectory as modern-day Ida Avenue. By 1964, the land immediately east of the APE had been cleared and levelled for the construction of I-5. Photographs from 1966 and 1967 shows the APE as not developed between Ida Avenue and I-5. By 1980, Ida Avenue had been paved and the properties

south of the APE had been developed for residential use. Aerials photographs between 1980 and 2016 showed the APE unmodified except for a temporary dirt road.

2.5 NAHC Sacred Lands File Search

A search of the NAHC Sacred Lands File was requested for the Project APE on January 16, 2020 (Appendix C). A search of this type requires NAHC staff to review their list for the presence of Native American sites, which are organized spatially based on a Public Land Survey System section grid (measuring 1 square mile). The NAHC responded on January 31, 2020, indicating that results of the search were negative for Native American sites. Additionally, the NAHC response letter included a list of Native American representatives who should be contacted for information about these sites.

Outreach letters were mailed on February 3, 2020, to all Native American representatives included on the NAHC contact list (Appendix C). These letters attempt to solicit additional information relating to cultural resources that could be impacted by the Project. Native American representatives were requested to define a general area where known resources intersect the Project APE. This will help guide communications with tribal groups and representatives that maintain specific traditional associations with the Project APE. Dudek received a response letter from Ray Teran, an administrator of Viejas Tribal Government, on February 14, 2020. Mr. Teran stated that the Project site has cultural significance to Viejas. Mr. Teran did not indicate the presence of any cultural resources within the Project APE but did request the presence of a Kumeyaay Cultural Monitor during Project ground disturbance.

Angelina Gutierrez of San Pasqual Band of Mission Indians responded via letter on February 14, 2020 stating that the Project is within the boundaries of what the tribe considers its Traditional Use Area. San Pasqual did not indicate the presence of any specific cultural resources within or adjacent to the Project APE but did request that they be included on the distribution list for any documents regarding previously reported or newly discovered resources. To date, there have been no additional responses to Dudek's tribal outreach efforts. Should Dudek receive any additional responses, the letters will be forwarded to KNN Management and the City.

Under CEQA, the lead agency is required to perform formal government-to-government consultation with Native American Tribes under Assembly Bill 52.

3 Methods

3.1 Survey

The survey of the Project APE was conducted on January 28, 2020. The APE was surveyed using a combination of north–south transects at 10-meter intervals. The Project site terrain consisted of a gentle hill trending south. The eastern off-site Caltrans ROW was located on the opposite side of a fence, so this portion of the APE was visually inspected from the fence. The ground visibility was poor due to nearly complete coverage by grass and ice plant.

An iPad Air with georeferenced Project maps and GPS capabilities was used to aid surveying and site recordation. Fieldwork was conducted by Dudek Archaeologist Matthew DeCarlo. Martin Padilla of Red Tail Environmental participated in the survey as the Native American monitor.

Documentation of cultural resources would have complied with the Office of Historic Preservation and Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 FR 44716-44740) and the California Office of Historic Preservation Planning Bulletin Number 4(a). All sites identified during this inventory would have been recorded on California Department of Parks and Recreation Form DPR 523 (Series 1/95), using the Instructions for Recording Cultural Resources (Office of Historic Preservation 1995).

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4 Results

4.1 Survey Results

Dudek Archaeologist Matthew DeCarlo and a Red Tail Native American monitor Martin Padilla conducted a pedestrian survey of the Project APE on January 28, 2020. The Project APE consists of a gentle hill trending south between I-5 and Ida Avenue. Though undeveloped, the APE is completely covered by vegetation. The pedestrian survey did not identify any cultural or built-environment resources within the Project APE.

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5 Management Considerations

5.1 Resource Management

This cultural resource inventory was conducted to determine the potential of the Project to impact cultural resources located within the APE. A records search of the SCIC did not identify any cultural resources within the APE; however, a scant marine shell and lithic scatter were identified immediately south of the APE. Review of historic aerial photographs demonstrate that the periphery of the Project site and all of the eastern Caltrans ROW may have been disturbed by construction of I-5, but the bulk of the Project site has not been largely disturbed. A search of the Sacred Lands File by the NAHC was negative for the presence of Native American sites and Native American outreach did not result in the identification of any resources in or adjacent to the APE. During the pedestrian survey, a Dudek archaeologist observed no cultural resources; however, the ground visibility was largely obscured.

Though the SCIC records search and pedestrian survey were negative, there is a heightened potential that the proposed Project will impact cultural resources. The immediate proximity of a previously identified prehistoric shell and artifact scatter increases the potential that buried resources exist within the Project APE. The vegetation covering the APE would have obscured any surficial evidence of cultural resources within the APE. Viejas Band of Kumeyaay Indian representative also requested the presence of a Kumeyaay Cultural Monitor during Project ground disturbance. Due to this heightened cultural sensitivity, Dudek recommends archaeological and Kumeyaay Native American monitoring during the initial ground disturbance to assure proper treatment of inadvertent cultural discoveries. Should excavations within the APE reveal a lack of cultural sensitivity, the cultural monitoring schedule can be reduced or eliminated.

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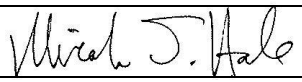
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7 Certification

Preparer: Micah Hale, PhD, RPA	**Title:** Archaeologist
Signature: 	**Date:** February 22, 2021

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Appendix A

Project Personnel Qualification

Matthew DeCarlo

Archaeologist

Matthew DeCarlo is an archaeologist with more than 8 years' professional experience leading archaeological surveys and excavations, performing lithic and faunal analyses, constructing and analyzing geographic information system (GIS) data, and producing cultural resource management reports.

As acting district archaeologist for the U.S. Forest Service (USFS), Mr. DeCarlo worked intensively with federal regulations and Native American tribal representatives and from this experience, has developed the ability to work collaboratively with consulting groups on multi-phase projects. Within the private sector, Mr. DeCarlo has managed the cultural resource requirements for large-scale utility projects which required extensive cooperation with utility managers, construction efforts, and Native American tribal representatives.

Education

California State University, Bakersfield
M.A., Anthropology, pending

University of California, Irvine
B.A., Anthropology, 2006

Professional Affiliations

San Diego Archaeological Society

Society for American Archaeology

Society for California Archaeology

Project Experience

Cultural Resources Impact Assessment and Evaluation for the West of Devers Upgrade Project (WODUP), Southern California Edison (SCE), Riverside and San Bernardino Counties, California. Served as project manager for a cultural resource impact assessment for a dual transmission line upgrade spanning from North Palm Springs to San Bernardino, California. Tasks included implementing archaeological surveys and excavations, producing a cultural resource evaluation report, and participation in construction site visits with SCE staff and construction specialists to resolve construction/resource conflicts. The WODUP preconstruction activities are nearing completion.

Construction Monitoring for Devers to Palo Verde 2 (DPV2) Transmission Line Project, SCE, Riverside County, California. Served as field director for the construction of a 500 kV transmission line spanning from Blythe to Romoland, California. Tasks included conducting archaeological surveys and excavations; managing construction monitoring teams; producing cultural resource records and reports; and consulting with SCE, construction, and Native American representatives. The final cultural resource report has been submitted and is awaiting approval.

Mountain Top Healthy Trees Project, USFS, Mount Pinos Ranger District, Santa Barbara County, California. Served as the acting district archaeologist for a proposed tree thinning project. To ensure that no previously recorded resources were impacted during the tree mastication, Mr. DeCarlo conducted a records search, delineated mastication boundaries, and monitored the mastication activities.

ARRA Wilderness Trails Restoration Project, USFS, Mount Pinos Ranger District, Santa Barbara and Ventura Counties, California. Served as the acting district archaeologist. Fulfilled cultural resource requirements for National Environmental Policy Act (NEPA) compliance to ensure the Mount Pinos Ranger District of the Los Padres Forest received American Recovery and Reinvestment Act (ARRA) federal funds to conduct trail work within wilderness areas. This required consultation with USFS supervisors to construct a viable timetable, completion of a records search, intensive survey of trails, and collaboration with trail maintenance crew chiefs to protect threatened cultural resources.

Cultural Resources Management for the Day Fire Reforestation Project, USFS, Mount Pinos Ranger District, Ventura County, California. Served as the acting district archaeologist for the reforestation of areas burned during the 2007 Day Wildfire. Prior to the planting of pine tree saplings, Mr. DeCarlo performed a records search, conducted an archaeological inventory, and evaluated the post-fire condition of previously identified archaeological sites. A survey report and archaeological site records were submitted to the Los Padres National Forest Headquarters and tree saplings were planted in the spring of 2010.

Sierra Madre Ridge Archaeological Survey and Rock Art Recordation Project, USFS, Mount Pinos Ranger District, Santa Barbara County, California. Served as the field chief for the Sierra Madre Ridge Project, a Section 110 of the National Historic Preservation Act (NHPA) project consisting of three one-week expeditions to update site records and survey previously unrecorded portions of a known archaeological district. Tasks included leading and training volunteer teams in survey and site recordation methods, updating previously recorded archaeological sites, identification of new sites, surveying previously unrecorded land, and managing fuels near significant sites to prevent possible fire damage. A survey report, site records, and GIS mapping were completed and submitted to the Los Padres National Forest Headquarters.

NEPA Compliance for the New Chuchupate Ranger Station, USFS, Mount Pinos Ranger District, Ventura County, California. Served as the acting district archaeologist. To ensure NEPA compliance and ensure acquisition of ARRA federal funds, conducted a records search, collaborated with the Forest Tribal Liaison, updated previously recorded sites, mapped the existing Chuchupate Ranger Station, conducted an intensive survey, contracted an architectural historian, and submitted a report to the Los Padres National Forest Headquarters.

Sapaski (Painted Rock) Tribal Protection Meeting, USFS, Mount Pinos Ranger District, Ventura County, California. Served as the acting district archaeologist for the Sapaski Tribal Protection Meeting, a collaborative effort with tribal representatives and USFS supervisors to protect a significant rock art resource. Conducted a records search and suggested possible protection strategies to tribal representatives.

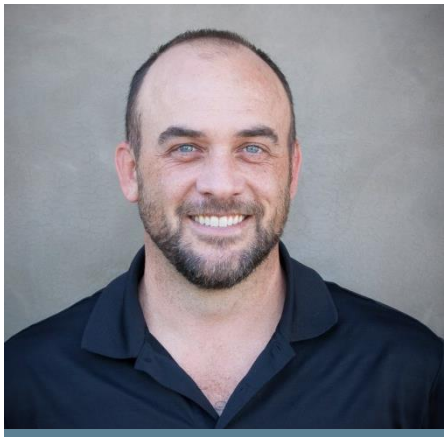
Archaeological Investigation for the Yellow Jacket Fire Project, USFS, Mount Pinos Ranger District, Ventura County, California. Served as the acting district archaeologist for the archaeological investigation after the Yellow Jacket Fire. Conducted a records search to identify any previously identified cultural resource within burned or staging areas, appraised sites impacted by both fire and fire-fighting measures, consulted with fire personnel to determine possible impacts, and submitted a report to the Los Padres National Forest Headquarters.

Micah Hale, PhD, RPA

Senior Archaeologist

Micah Hale is Dudek's cultural resources lead principal investigator, with technical expertise as a lithic and groundstone analyst, invertebrate analyst, and in ground penetrating radar. Over the course of his 19-year career, Dr. Hale has served as a principal investigator in the public and private sector for all levels of archaeological investigation, as a public outreach coordinator and as an assistant professor at the University of California, Davis (U.C. Davis). He currently functions as a principal investigator in project oversight including proposals, research designs, fieldwork, artifact analysis, and report authorship.

Dr. Hale's experience is both academic and professional spanning California, Arizona, Nevada, and Oregon, including work for Naval Facilities Engineering Command (NAVFAC) Southwest, California Department of Transportation (Caltrans), Western Area Power Administration, Bureau of Land Management (BLM), U.S. Army Corps of Engineers (ACOE), U.S. Fish and Wildlife Service (USFWS), California State Parks, various city and county agencies, and directly for Native American groups. Dr. Hale has supervised numerous large-scale surveys, test excavations, data recovery programs, and geoarchaeological investigations, served as a third party review consultant, and an expert witness in legal proceedings. He has authored research designs, management and treatment plans, proposals, preliminary and final reports, and technical analyses. Dr. Hale has integrated his personal research interests into projects and participated in professional symposia at local and national venues, including the Society for American Archaeology and the Society for California Archaeology. Additionally, he has conducted academic research in the Polar Arctic, Greenland. Dr. Hale's current focus is on hunter-gatherer archaeology of California and the Great Basin, applying theoretical premises of cultural evolution and human behavioral ecology.



Micah Hale

Education

University of California, Davis
PhD, Anthropology, 2009

California State University, Sacramento
MA, Anthropology, 2001

University of California, Davis
BS, Anthropology, 1996

Certifications

Register of Professional Archaeologists (RPA), 2001

Professional Affiliations

Society for American Archaeology

Society for California Archaeology

Antelope Valley Archaeological Society

San Diego Archaeological Society

Project Experience

Phase II Archaeological Data Recovery for the Newland Homes Sierra Project, San Diego County, California. As project manager and principal investigator, supervising data recovery investigations at two significant prehistoric archaeological sites and historic archival research of a homestead in support of the Newland Sierra Environmental Impact Report (EIR).

Phase I Archaeological Inventory and Phase II Archaeological Evaluation for the Yokohl Ranch Project, Tulare County, California. As project manager and principal investigator, supervised completion of 12,000 acre survey and archaeological evaluation of 85 prehistoric and historical archaeological sites in support of the Yokohl Ranch EIR.

Phase I Inventory and Phase II Cultural Resources Evaluation for the Star Ranch Project, RBF Consulting, San Diego County, California. As project manager and principal investigator, supervised CEQA inventory and evaluation for private development.

Phase II Archaeological Evaluation of Two Prehistoric Sites, Torrey Pines Glider Port, San Diego County, California. As project manager and principal investigator, supervised CEQA evaluation of two prehistoric archaeological sites for the Torrey Pines City Park General Development Plan.

Data Recovery of One Prehistoric Site for the Rhodes Property, Sea Breeze Properties, San Diego County, California. As project manager and principal investigator, supervised CEQA compliant data recovery of a large prehistoric site for a residential development.

Archaeological Survey of the Paramount Mine Exploratory Drilling Project, Essex Environmental, Mono County, Nevada. As principal investigator and field director, conducted archaeological survey for mining exploration and prepared the technical report.

Phase I Inventory of 1,544 Acres and Phase II Evaluation of Archaeological Sites along the Western and Northwestern Boundaries, Edwards Air Force Base, Kern County, California. As field director, supervised a Phase I inventory of 1,544 acres. Recorded 30 new archaeological sites, more than a dozen "sub-modern" refuse dumps, and a variety of isolate finds. Notable sites include several early Holocene lithic scatters (Lake Mojave-, Silver Lake-, and Pinto-age deposits), a rhyolite lithic quarry, and a complex of historic dumps associated with homesteading activities around Lone Butte.

Archaeological Survey of the La Mesa Meadows Residential Development Project, Helix Environmental, San Diego County, California. As principal investigator, conducted a survey of a proposed residential development in San Diego County.

Pankey Ranch Testing, Pardee Homes, Northern San Diego County, California. As field director, supervised excavation of shovel test pits to delineate the boundaries of site CA-SDI-682, the prehistoric village of Tom-Kav. Managed field personnel, conducted excavation, and wrote portions of technical report.

Oceanside Hilton EIR, Dudek Associates, Oceanside, San Diego County, California. As principal investigator and field director, conducted a survey of the proposed Hilton Hotel at the eastern end of Buena Vista Lagoon in Carlsbad and prepared portions of technical report for an EIR.

Data Recovery of Locus O, Star Canyon Development, Agua Caliente Band of Cahuilla Indians, Palm Springs, Riverside County, California. As field director, supervised field crews for data recovery mitigation of an archaeological deposit and human remains near Tahquitz Canyon. Coordinated with Native American representatives and prepared portions of the technical report.

Linda Vista Survey, City of San Marcos Planning Department, San Diego County, California. As field director, conducted a Phase I cultural resource inventory of the proposed road realignment in San Marcos. Prepared technical reports and made recommendations for additional work to be done within the project area.

Kaiser Permanente Murrieta Valley Medical Center Preliminary Environmental Impact Report (PEIR), City of Murrieta, California. Dr. Hale acted as Principal Investigator on the Kaiser Murrieta project, overseeing a Phase I cultural resources inventory and Phase II archaeological significance evaluation of one prehistoric resource. Dr. Hale assisted the City with Tribal communication and analysis of potential impacts to a viewshed considered sensitive by local Native Americans. All studies were completed to comply with CEQA guidelines in support of an EIR.

Appendix B (Confidential)

SCIC Records Search Results

Appendix C

NAHC Sacred Lands File Search Results and Tribal Correspondence

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Sacred Lands File & Native American Contacts List Request

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Blvd, Suite 100
West Sacramento, CA 95501
(916) 373-3710
(916) 373-5471 – Fax
nahc@nahc.ca.gov

Information Below is Required for a Sacred Lands File Search

Project: Ida Avenue - PN 12302

County: San Diego

USGS Quadrangle

Name: Del Mar

Township: 14 South Range: 4 West Section(s): 1

Company/Firm/Agency:

Dudek

Contact Person: Matthew DeCarlo

Street Address: 605 Third Street

City: Encinitas, CA Zip: 92024

Phone: (760) 815-7067 Extension:

Fax: (760) 632-0164

Email: mdecarlo@dudek.com

Project Description:

The proposed project consists of land development.

☑ Project Location Map is attached

NATIVE AMERICAN HERITAGE COMMISSION

CHAIRPERSON
Laura Miranda
Luiseño

VICE CHAIRPERSON
Reginald Pagaling
Chumash

SECRETARY
Merri Lopez-Keifer
Luiseño

PARLIAMENTARIAN
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Karuk

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Marshall McKay
Wintun

COMMISSIONER
William Mungary
Paiute/White Mountain Apache

COMMISSIONER
Joseph Myers
Pomo

COMMISSIONER
Julie Tumamait-Stenslie
Chumash

COMMISSIONER
[Vacant]

EXECUTIVE SECRETARY
Christina Snider
Pomo

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

January 31, 2020

Matthew DeCarlo
Dudek

Via Email to: mdecarlo@dudek.com

Re: Ida Avenue – PN 12302 Project, San Diego County

Dear Mr. DeCarlo:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were negative. However, the absence of specific site information in the SLF does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded 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. I suggest you contact all of those indicated; if they cannot supply information, they might 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 me. 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: steven.quinn@nahc.ca.gov.

Sincerely,

Steven Quinn
Associate Governmental Program Analyst

Attachment

Native American Heritage Commission
Native American Contact List
San Diego County
1/31/2020

Barona Group of the Capitan Grande
Edwin Romero, Chairperson
1095 Barona Road — Diegueno
Lakeside, CA, 92040
Phone: (619) 443 - 6612
Fax: (619) 443-0681
cloyd@barona-nsn.gov

Campo Band of Diegueno Mission Indians
Ralph Goff, Chairperson
36190 Church Road, Suite 1 — Diegueno
Campo, CA, 91906
Phone: (619) 478 - 9046
Fax: (619) 478-5818
rgoff@campo-nsn.gov

Ewiiaapaayp Band of Kumeyaay Indians
Michael Garcia, Vice Chairperson
4054 Willows Road — Diegueno
Alpine, CA, 91901
Phone: (619) 445 - 6315
Fax: (619) 445-9126
michaelg@leaningrock.net

Ewiiaapaayp Band of Kumeyaay Indians
Robert Pinto, Chairperson
4054 Willows Road — Diegueno
Alpine, CA, 91901
Phone: (619) 445 - 6315
Fax: (619) 445-9126
wmicklin@leaningrock.net

Iipay Nation of Santa Ysabel
Clint Linton, Director of Cultural Resources
P.O. Box 507 — Diegueno
Santa Ysabel, CA, 92070
Phone: (760) 803 - 5694
cjlinton73@aol.com

Iipay Nation of Santa Ysabel
Virgil Perez, Chairperson
P.O. Box 130 — Diegueno
Santa Ysabel, CA, 92070
Phone: (760) 765 - 0845
Fax: (760) 765-0320

Inaja-Cosmit Band of Indians
Rebecca Osuna, Chairperson
2005 S. Escondido Blvd. — Diegueno
Escondido, CA, 92025
Phone: (760) 737 - 7628
Fax: (760) 747-8568

Jamul Indian Village
Erica Pinto, Chairperson
P.O. Box 612 — Diegueno
Jamul, CA, 91935
Phone: (619) 669 - 4785
Fax: (619) 669-4817
epinto@jiv-nsn.gov

Kwaaymii Laguna Band of Mission Indians
Carmen Lucas,
P.O. Box 775 — Kwaaymii
Pine Valley, CA, 91962 — Diegueno
Phone: (619) 709 - 4207

La Posta Band of Diegueno Mission Indians
Javaughn Miller, Tribal Administrator
8 Crestwood Road — Diegueno
Boulevard, CA, 91905
Phone: (619) 478 - 2113
Fax: (619) 478-2125
jmiller@LPtribe.net

La Posta Band of Diegueno Mission Indians
Gwendolyn Parada, Chairperson
8 Crestwood Road — Diegueno
Boulevard, CA, 91905
Phone: (619) 478 - 2113
Fax: (619) 478-2125
LP13boots@aol.com

Manzanita Band of Kumeyaay Nation
Angela Elliott Santos, Chairperson
P.O. Box 1302 — Diegueno
Boulevard, CA, 91905
Phone: (619) 766 - 4930
Fax: (619) 766-4957

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 Ida Avenue - PN 12302 Project, San Diego County.

Native American Heritage Commission
Native American Contact List
San Diego County
1/31/2020

Mesa Grande Band of Diegueno Mission Indians
Michael Linton, Chairperson
P.O Box 270 Diegueno
Santa Ysabel, CA, 92070
Phone: (760) 782 - 3818
Fax: (760) 782-9092
mesagrandeband@msn.com

San Pasqual Band of Diegueno Mission Indians
John Flores, Environmental Coordinator
P. O. Box 365 Diegueno
Valley Center, CA, 92082
Phone: (760) 749 - 3200
Fax: (760) 749-3876
johnf@sanpasqualtribe.org

San Pasqual Band of Diegueno Mission Indians
Allen Lawson, Chairperson
P.O. Box 365 Diegueno
Valley Center, CA, 92082
Phone: (760) 749 - 3200
Fax: (760) 749-3876
allenl@sanpasqualtribe.org

Sycuan Band of the Kumeyaay Nation
Kristie Orosco, Kumeyaay Resource Specialist
1 Kwaaypaay Court Kumeyaay
El Cajon, CA, 92019
Phone: (619) 445 - 6917

Sycuan Band of the Kumeyaay Nation
Cody Martinez, Chairperson
1 Kwaaypaay Court Kumeyaay
El Cajon, CA, 92019
Phone: (619) 445 - 2613
Fax: (619) 445-1927
ssilva@sycuan-nsn.gov

Viejas Band of Kumeyaay Indians
Ernest Pingleton, Tribal Historic Officer, Resource Management
1 Viejas Grade Road Diegueno
Alpine, CA, 91901
Phone: (619) 659 - 2314
epingleton@viejas-nsn.gov

Viejas Band of Kumeyaay Indians
John Christman, Chairperson
1 Viejas Grade Road Diegueno
Alpine, CA, 91901
Phone: (619) 445 - 3810
Fax: (619) 445-5337

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 Ida Avenue - PN 12302 Project, San Diego County.

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

February 3, 2020

Mr. John Christman, Chairperson
Viejas Band of Kumeyaay Indians
1 Viejas Grade Rd.
Alpine, CA 91901

Subject: ***Information Request for the Ida Avenue Apartment Project in the City of San Diego, California***

Dear Mr. Christman,

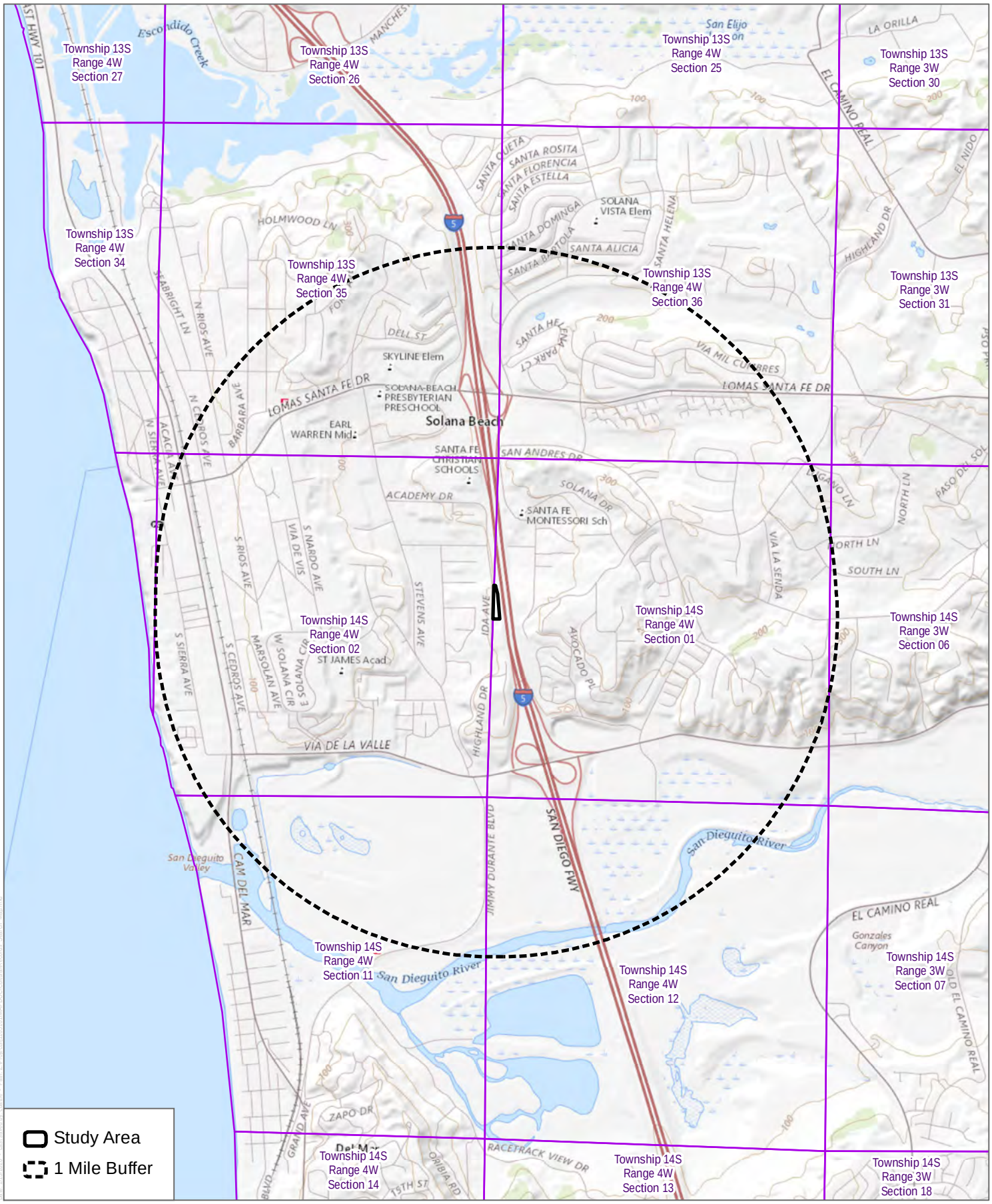
A private developer has proposed the construction of an apartment complex in the City of Solana Beach, California. The project area is a one-acre undeveloped lot located within a residential development adjacent to Interstate 5. The project area is located in Section 01 within Township 14S/ Range 4W of the Del Mar, CA 1:24,000 USGS map (Figure 1).

The Native American Heritage Commission conducted a Sacred Lands file search for the project area. The results of the search were negative for cultural resources within the project area. I am writing as part of the cultural inventory process in order find out if you, or your tribal community, have any knowledge of cultural resources or places that may be impacted by the proposed project. This letter does not constitute formal government-to-government consultation pursuant to Assembly Bill 52 or Senate Bill 18.

If you have any information or concerns pertaining to such information, please contact me.

Respectfully,

Matthew DeCarlo, M.A.
Archaeologist
DUDEK
Phone: (760) 479-4831
Email: mdecarlo@dudek.com



SOURCE: USGS 7.5-Minute Series Rancho Santa Fe, Encinitas, Del Mar Quadrangles
Township

DUDEK

0 1,000 2,000 Feet
0 285 570 Meters
1:24,000

Records Search

Ida Avenue Project

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

February 3, 2020

Mr. John Flores, Environmental Coordinator
San Pasqual Band of Diegueno Mission Indians
P.O. Box 365
Valley Center, CA 92082

Subject: ***Information Request for the Ida Avenue Apartment Project in the City of San Diego, California***

Dear Mr. Flores,

A private developer has proposed the construction of an apartment complex in the City of Solana Beach, California. The project area is a one-acre undeveloped lot located within a residential development adjacent to Interstate 5. The project area is located in Section 01 within Township 14S/ Range 4W of the Del Mar, CA 1:24,000 USGS map (Figure 1).

The Native American Heritage Commission conducted a Sacred Lands file search for the project area. The results of the search were negative for cultural resources within the project area. I am writing as part of the cultural inventory process in order find out if you, or your tribal community, have any knowledge of cultural resources or places that may be impacted by the proposed project. This letter does not constitute formal government-to-government consultation pursuant to Assembly Bill 52 or Senate Bill 18.

If you have any information or concerns pertaining to such information, please contact me.

Respectfully,

Matthew DeCarlo, M.A.
Archaeologist
DUDEK
Phone: (760) 479-4831
Email: mdecarlo@dudek.com

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

February 3, 2020

Mr. Michael Garcia, Vice Chairperson
Ewiiaapaayp Tribe
4054 Willows Road
Alpine, CA 91901

Subject: ***Information Request for the Ida Avenue Apartment Project in the City of San Diego, California***

Dear Mr. Garcia,

A private developer has proposed the construction of an apartment complex in the City of Solana Beach, California. The project area is a one-acre undeveloped lot located within a residential development adjacent to Interstate 5. The project area is located in Section 01 within Township 14S/ Range 4W of the Del Mar, CA 1:24,000 USGS map (Figure 1).

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If you have any information or concerns pertaining to such information, please contact me.

Respectfully,

Matthew DeCarlo, M.A.
Archaeologist
DUDEK
Phone: (760) 479-4831
Email: mdecarlo@dudek.com

DUDEK

MAIN OFFICE
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February 3, 2020

Mr. Ralph Goff, Chairperson
Campo Band of Diegueno Mission Indians
36190 Church Road, Suite 1
Campo, CA 91906

Subject: ***Information Request for the Ida Avenue Apartment Project in the City of San Diego, California***

Dear Mr. Goff,

A private developer has proposed the construction of an apartment complex in the City of Solana Beach, California. The project area is a one-acre undeveloped lot located within a residential development adjacent to Interstate 5. The project area is located in Section 01 within Township 14S/ Range 4W of the Del Mar, CA 1:24,000 USGS map (Figure 1).

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February 3, 2020

Mr. Allen E. Lawson, Chairperson
San Pasqual Band of Diegueno Mission Indians
P.O. Box 365
Valley Center, CA 92082

Subject: ***Information Request for the Ida Avenue Apartment Project in the City of San Diego, California***

Dear Mr. Lawson,

A private developer has proposed the construction of an apartment complex in the City of Solana Beach, California. The project area is a one-acre undeveloped lot located within a residential development adjacent to Interstate 5. The project area is located in Section 01 within Township 14S/ Range 4W of the Del Mar, CA 1:24,000 USGS map (Figure 1).

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February 3, 2020

Mr. Clint Linton, Director of Cultural Resources
Iipay Nation of Santa Ysabel
P.O. Box 507
Santa Ysabel, CA 92070

Subject: ***Information Request for the Ida Avenue Apartment Project in the City of San Diego, California***

Dear Mr. Linton,

A private developer has proposed the construction of an apartment complex in the City of Solana Beach, California. The project area is a one-acre undeveloped lot located within a residential development adjacent to Interstate 5. The project area is located in Section 01 within Township 14S/ Range 4W of the Del Mar, CA 1:24,000 USGS map (Figure 1).

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Respectfully,

Matthew H DeCarlo

_____

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February 3, 2020

Mr. Michael Linton, Chairperson
Mesa Grande Band of Diegueno Mission Indians
P.O. Box 270
Santa Ysabel, CA 92070

Subject: ***Information Request for the Ida Avenue Apartment Project in the City of San Diego, California***

Dear Mr. Linton,

A private developer has proposed the construction of an apartment complex in the City of Solana Beach, California. The project area is a one-acre undeveloped lot located within a residential development adjacent to Interstate 5. The project area is located in Section 01 within Township 14S/ Range 4W of the Del Mar, CA 1:24,000 USGS map (Figure 1).

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February 3, 2020

Ms. Carmen Lucas,
Kwaaymii Laguna Band of Mission Indians
P.O. Box 775
Pine Valley, CA 91962

Subject: ***Information Request for the Ida Avenue Apartment Project in the City of San Diego, California***

Dear Ms. Lucas,

A private developer has proposed the construction of an apartment complex in the City of Solana Beach, California. The project area is a one-acre undeveloped lot located within a residential development adjacent to Interstate 5. The project area is located in Section 01 within Township 14S/ Range 4W of the Del Mar, CA 1:24,000 USGS map (Figure 1).

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February 3, 2020

Mr. Cody Martinez, Chairperson
Sycuan Band of the Kumeyaay Nation
1 Kwaaypaay Court
El Cajon, CA 92019

Subject: ***Information Request for the Ida Avenue Apartment Project in the City of San Diego, California***

Dear Mr. Martinez,

A private developer has proposed the construction of an apartment complex in the City of Solana Beach, California. The project area is a one-acre undeveloped lot located within a residential development adjacent to Interstate 5. The project area is located in Section 01 within Township 14S/ Range 4W of the Del Mar, CA 1:24,000 USGS map (Figure 1).

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February 3, 2020

Ms. Javaughn Miller, Tribal Administrator
La Posta Band of Diegueno Mission Indians
8 Crestwood Rd.
Boulevard, CA 91905

Subject: ***Information Request for the Ida Avenue Apartment Project in the City of San Diego, California***

Dear Ms. Miller,

A private developer has proposed the construction of an apartment complex in the City of Solana Beach, California. The project area is a one-acre undeveloped lot located within a residential development adjacent to Interstate 5. The project area is located in Section 01 within Township 14S/ Range 4W of the Del Mar, CA 1:24,000 USGS map (Figure 1).

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February 3, 2020

Ms. Kristie Orosco, Resource Specialist
Sycuan Band of the Kumeyaay Nation
1 Kwaaypaay Court
El Cajon, CA 92019

Subject: ***Information Request for the Ida Avenue Apartment Project in the City of San Diego, California***

Dear Ms. Orosco,

A private developer has proposed the construction of an apartment complex in the City of Solana Beach, California. The project area is a one-acre undeveloped lot located within a residential development adjacent to Interstate 5. The project area is located in Section 01 within Township 14S/ Range 4W of the Del Mar, CA 1:24,000 USGS map (Figure 1).

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February 3, 2020

Ms. Rebecca Osuna, Chairperson
Inaja-Cosmit Band of Indians
2005 S. Escondido Blvd.
Escondido, CA 92025

Subject: ***Information Request for the Ida Avenue Apartment Project in the City of San Diego, California***

Dear Ms. Osuna,

A private developer has proposed the construction of an apartment complex in the City of Solana Beach, California. The project area is a one-acre undeveloped lot located within a residential development adjacent to Interstate 5. The project area is located in Section 01 within Township 14S/ Range 4W of the Del Mar, CA 1:24,000 USGS map (Figure 1).

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February 3, 2020

Ms. Gwendolyn Parada, Chairperson
La Posta Band of Diegueno Mission Indians
8 Crestwood Rd.
Boulevard, CA 91905

Subject: ***Information Request for the Ida Avenue Apartment Project in the City of San Diego, California***

Dear Ms. Parada,

A private developer has proposed the construction of an apartment complex in the City of Solana Beach, California. The project area is a one-acre undeveloped lot located within a residential development adjacent to Interstate 5. The project area is located in Section 01 within Township 14S/ Range 4W of the Del Mar, CA 1:24,000 USGS map (Figure 1).

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February 3, 2020

Mr. Virgil Perez, Chairperson
Iipay Nation of Santa Ysabel
P.O. Box 130
Santa Ysabel, CA 92070

Subject: ***Information Request for the Ida Avenue Apartment Project in the City of San Diego, California***

Dear Mr. Perez,

A private developer has proposed the construction of an apartment complex in the City of Solana Beach, California. The project area is a one-acre undeveloped lot located within a residential development adjacent to Interstate 5. The project area is located in Section 01 within Township 14S/ Range 4W of the Del Mar, CA 1:24,000 USGS map (Figure 1).

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February 3, 2020

Mr. Ernest Pingleton, Tribal Historic Officer
Viejas Band of Kumeyaay Indians
1 Viejas Grade Rd.
Alpine, CA 91901

Subject: ***Information Request for the Ida Avenue Apartment Project in the City of San Diego, California***

Dear Mr. Pingleton,

A private developer has proposed the construction of an apartment complex in the City of Solana Beach, California. The project area is a one-acre undeveloped lot located within a residential development adjacent to Interstate 5. The project area is located in Section 01 within Township 14S/ Range 4W of the Del Mar, CA 1:24,000 USGS map (Figure 1).

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February 3, 2020

Ms. Erica Pinto, Chairperson
Jamul Indian Village
P.O. Box 612
Jamul, CA 91935

Subject: ***Information Request for the Ida Avenue Apartment Project in the City of San Diego, California***

Dear Ms. Pinto,

A private developer has proposed the construction of an apartment complex in the City of Solana Beach, California. The project area is a one-acre undeveloped lot located within a residential development adjacent to Interstate 5. The project area is located in Section 01 within Township 14S/ Range 4W of the Del Mar, CA 1:24,000 USGS map (Figure 1).

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February 3, 2020

Mr. Robert Pinto, Chairperson
Ewiiaapaayp Tribe
4054 Willow Rd.
Alpine, CA 91901

Subject: ***Information Request for the Ida Avenue Apartment Project in the City of San Diego, California***

Dear Mr. Pinto,

A private developer has proposed the construction of an apartment complex in the City of Solana Beach, California. The project area is a one-acre undeveloped lot located within a residential development adjacent to Interstate 5. The project area is located in Section 01 within Township 14S/ Range 4W of the Del Mar, CA 1:24,000 USGS map (Figure 1).

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February 3, 2020

Mr. Edwin (Thorpe) Romero, Chairperson
Barona Group of the Capitan Grande
1095 Barona Road
Lakeside, CA 92040

Subject: ***Information Request for the Ida Avenue Apartment Project in the City of San Diego, California***

Dear Mr. Romero,

A private developer has proposed the construction of an apartment complex in the City of Solana Beach, California. The project area is a one-acre undeveloped lot located within a residential development adjacent to Interstate 5. The project area is located in Section 01 within Township 14S/ Range 4W of the Del Mar, CA 1:24,000 USGS map (Figure 1).

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February 3, 2020

Ms. Angela Elliott Santos, Chairperson
Manzanita Band of Kumeyaay Nation
P.O. Box 1302
Boulevard, CA 91905

Subject: ***Information Request for the Ida Avenue Apartment Project in the City of San Diego, California***

Dear Ms. Santos,

A private developer has proposed the construction of an apartment complex in the City of Solana Beach, California. The project area is a one-acre undeveloped lot located within a residential development adjacent to Interstate 5. The project area is located in Section 01 within Township 14S/ Range 4W of the Del Mar, CA 1:24,000 USGS map (Figure 1).

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Respectfully,

Matthew M DeCarlo

_____

Matthew DeCarlo, M.A.
Archaeologist
DUDEK
Phone: (760) 479-4831
Email: mdecarlo@dudek.com

Fri 2/14/2020 3:21 PM

Ida Avenue Apartment Project

From Ray Teran rteran@viejas-nsn.gov
To Matthew DeCarlo
Cc Ernest Pingleton

The Viejas Band of Kumeyaay Indians ("Viejas") has reviewed the proposed project and at this time we have determined that the project site has cultural significance or ties to Viejas.

Viejas Band request that a Kumeyaay Cultural Monitor be on site for ground disturbing activities and to inform us of any new developments such as inadvertent discovery of cultural artifacts, cremation sites, or human remains.

If you wish to utilize Viejas cultural monitors, please call Ernest Pingleton at 619-659-2314 or email, epingleton@viejas-nsn.gov, for contracting and scheduling. Thank you.

Ray Teran
Viejas Tribal Government
Grant Writer / Administrator
619-659-2312
rteran@viejas-nsn.gov

IPAI

SAN PASQUAL BAND OF MISSION INDIANS

SAN PASQUAL RESERVATION

TRIBAL COUNCIL

Stephen W. Cope
Chairman

Justin Quis Quis
Vice Chairman

Tilda M. Green
Secretary-Treasurer

David L. Toler
Councilman

Joe Chavez
Councilman

February 14, 2020

Matthew DeCarlo, M.A.
605 Third Street
Encinitas, CA. 92024

RE: Ida Avenue Apartment in the city of San Diego California

Dear Mr. DeCarlo,

The San Pasqual Band of Mission Indians Tribal Historic Preservation Office has received your notification of the project referenced above. This letter constitutes our response on behalf of David L. Toler THPO Officer.

We have consulted our maps and determined that the project as described is not within the boundaries of the recognized San Pasqual Indian Reservation. It is, however, within the boundaries of the territory that the tribe considers its Traditional Use Area (TUA). Therefore, we request to be kept in the information loop as the project progresses and would appreciate being maintained on the receiving list for project updates, reports of investigations, and /or any documentation that might be generated regarding previously reported or newly discovered sites. Further, we may recommend archaeological pending the results of site surveys and records searches associated with the project. If the project boundaries are modified to extend beyond the currently proposed limits, we request updated information and the opportunity to respond to your changes.

San Pasqual Band is requesting consultation to talk about San Pasqual Possibly monitoring for this project. Thank you

We appreciate involvement with your initiative and look forward to working with you on future efforts. If you have questions or need additional information, please do not hesitate to contact me by telephone 760-651-5142 or by e-mail at THPO@sanpasqualtribe.org.

Sincerely,

Angelina Gutierrez

Angelina Gutierrez
Tribal Historic Preservation Office, Monitor Supervisor
San Pasqual Band of Mission Indians

Appendix D-1
Preliminary Drainage Report

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Preliminary Drainage Report

For

Ida Avenue Apartments

In the

City of Solana Beach

County of San Diego, California

Preparation Date: February 9, 2018

Revision Date: May 17, 2018
June 30, 2020
April 21, 2021



Armstrong & Brooks Consulting Engineers
Office Address:
1350 East Chase Drive
Corona, CA 92881

Mailing Address:
PO Box 78088
Corona, CA 92879

PREPARED BY:



Dennis Armstrong
R.C.E. 48758
EXPIRES 9/30/2022

JN 117.1574

TABLE OF CONTENTS

	Page
Introduction …….…….	3
Design Criteria……..…….	4
Design Methodology…….…….	5
Narrative...…….	6
Conclusion...…….	9
Hydrology Calculations – Existing Conditions..……...……..….Appendix A	
Hydrology Calculations – Proposed Conditions.……..……..….Appendix B	
Drainage Exhibits…….……...……..……...….Appendix C	

INTRODUCTION

The Ida Avenue Apartments project is a proposal to construct an 8-unit apartment complex on an undeveloped lot. The project site is located in between the Interstate 5 and Ida Ave. in the City of Solana Beach. Existing homes are to the south, west, and north of the site. The site sits within the San Dieguito Hydrological Unit within the Regional Water Quality Control Board San Diego Region (9) San Diego Hydrologic Basin Planning Area.

Review of record data and maps and the site geotechnical report, moderate to high infiltration rates are expected for the site. USDA - NRCSS maps show that the site is underlaid with hydrologic soils Group A and Group B soils and the geotechnical report notes that the majority of soils found were silty sand.

The proposed project will consist of two buildings totaling eight two-story apartment units with underground garage parking. Filterra catch basins are proposed to treat onsite stormwater runoff. Underground Advance Drainage System (ADS) storage chambers are proposed to mitigate the fractional 2-year and 10-year pre-post development volume and duration differentials.

The San Diego County Hydrology Manual was used to create both rational method and unit hydrograph models. Rational calculations were used to analyze stormwater flow rates generated on and off site, while unit hydrograph calculations were created to analyze routing of onsite stormwater volumes.

DESIGN CRITERIA

This Drainage Study was based on the following Design Criteria identified by the County of San Diego Flood Control District:

1. Tributary flows must be routed through the site in a safe and non-destructive manner.

2. The fractional 2 year and 10 year post development volume and duration can't exceed 10% of the pre development volume and duration.

3. The 100 year peak flow shall be contained within the right-of-way limits and the 50 year peak flow shall be contained within ½" of top of curb.

DESIGN METHODOLOGY

1. **RATIONAL METHOD** – The rational method is used to determine the peak discharge for watersheds (less than 1 square mile). Civil Design Software by Bonadiman and Associates was used to model the San Diego County Department of Public Works (SDCDPW) rational method for the project site. The following design data was used within our model:

   A. Rainfall (Rational) – Rainfall for the 6 hour and 24 hour storms were input.

   B. Infiltration – Soil Types "A" and "B" underlie the site area based on a review of the hydrologic soils group map USGS maps.

2. **UNIT HYDROGRAPH** – The unit hydrograph is used to determine the storm water volume generated. Civil Design Software by Bonadiman and Associates was used to model the SDCDPW unit hydrograph for the project site. The following design data was used within our model:

   A. Time of Concentration – The rational method time of concentration is used for estimation of basin lag time.

   B. S-Graphs – The CIVILD program uses an S-Graph summation hydrograph approach where the watershed discharge, in percent ultimate discharge as a function of time expressed in percent of lag, is stored in or calculated by the program. The stored S-Graphs are those developed for Valley, Valley Developed, Foothill, Mountain, or Desert areas.

Narrative

Existing Conditions

The undeveloped site is located approximately 650' southerly of Genevieve St. between the I-5 and Ida Ave. The site is moderately covered with natural shrubs and grasses and slopes from east to west at a slope range from 10% to 3 to 1. There are no existing improvements or impervious areas. The area tributary to the proposed outlet locations is 1.17 acres and some of which is within the CALTRANS right of way.

An existing ridge traverses from east to west and divides the site into two drainage management areas (DMA)s: DMA A and DMA B. Offsite flows begin easterly of the proposed site at a high point along a ridge adjacent to the I-5 within CALTRANS right of way. Existing offsite flows sheet flow northeasterly towards Ida Avenue. Runoff is captured by an existing natural swale easterly of Ida Avenue. Flows are divided by an existing high point within Ida Avenue which forces flows to run northerly or southerly along Ida Avenue. The site outlet from the proposed project was used to determine the tributary area under the existing conditions to compare pre and post-development flows and volumes.

There are no existing curb and gutter, storm drain catch basins, or storm drain lines in the immediate vicinity of the project site or to the south of the site. Existing curb and gutter to the north of the site conveys flow northerly to an existing catch basin near the intersection of Genevieve Street and Ida Avenue.

DMA A-1 is the 0.66-acre, northerly watershed tributary to Ida Ave. Offsite flows within the CALTRANS right of way start at approximately 30' north of the site at a high point in DMA A-1. DMA A-1 generates a 100-year flow rate of 0.5 CFS.

DMA B-1 is the 0.51-acre, southerly watershed tributary to Ida Ave. Offsite flows within the CALTRANS right of way start at approximately 30' north of the site at a high point in DMA B-1. DMA B-1 generates a 100-year flow rate of 0.4 CFS.

A unit hydrograph model for existing conditions was created to determine the total volume generated from the tributary area. The 10-year volume generated from the site was found to be 0 CF due to soil loss of the volume into the ground.

Proposed Conditions

The proposed site consists of two proposed buildings with eight apartment units, driveways, underground parking, sidewalks, landscaping, and a playground area. Sump pumps will be installed in the underground parking garages in order to convey flow to the street, where it will eventually be conveyed into one of two Filterra treatment systems. Drop inlet catch basins and HDPE pipe will be installed to convey onsite flow onto Ida Ave. Two 4'x6' Filterra catch basins will be constructed on Ida Ave. to treat stormwater generated onsite. After runoff is captured and treated by an Filterra System, runoff is then discharged into an ADS perforated underground storage chamber to detain the post-development 10-year volumes. These flows will be detained and infiltrated into the ground. For storm flows greater than the 10-year event, flows will be bypassed via an overflow system and continue along Ida Ave. to perpetuate pre-development flow patterns and quantities.

The proposed site was divided into two DMAs to perpetuate existing drainage patterns, A-2 and B-2, and three additional DMAs, C-1, C-2, and C-3, where created to represent the areas that flow to the sump pumps.

Offsite flows generated upstream of the site from 0.23 acres in the CALTRANS right of way will be captured before coming onsite and conveyed within a 12-inch V-ditch along the easterly edge before entering into a proposed storm drain line and discharging along Ida Avenue. This offsite area as been divided in to two DMAs, A-1 and B-1. DMA A-1 produces a 100-year flow of 0.28 CFS; DMA B-1 produces a 100-year flow of 0.32 CFS.

DMA A-2 is the onsite northerly watershed tributary to Ida Ave, Filterra Catch Basin A, and Point of Connection 1 (POC 1). DMA A-2 generates a 100-year onsite flow of 1.14 CFS.

DMA B-2 is the onsite southerly watershed tributary to Ida Ave, Filterra Catch Basin B, and POC 2. DMA B-2 generates a 100-year onsite flow of 0.83 CFS.

DMA C-1 and DMA C-2 each produce 0.03 CFS of runoff to sump pump #1 and #2. DMA C-3 produces 0.07 CFS of runoff to sump pump #3. All three proposed pumps will convey runoff to Ida Ave, where it will be captured by Filterra Catch Basin A.

DMA D is an onsite portion that is not captured by the proposed storm drain system. This area drains westerly towards Ida Ave and is conveyed south.

A unit hydrograph model for proposed conditions was created to determine the total volume of runoff generated from the entire 0.94-acre site. The 10-year volume generated from the site was found to be 3,157 CF. This volume found from the unit hydrograph calculation included a total soil rain loss of 2.13" across the 0.50 acres of pervious proposed area. Since the City of Solana Beach does not allow for infiltration to be used in the sizing of detention basins, an additional

volume equivalent to the infiltration loss (3,866 cf) will be added to the storage requirements, for a total storage volume requirement of 7,023 CF.

2.13” x 1’/12” x 0.50 AC x 43,560 SF/AC = 3,866 CF

This volume will be stored within two separate storage chamber systems distributed between DMA A-2 and B-2. Using the ADS stormwater chamber design tool, each storage chamber was calculated to store approximately 215.1 CF of stormwater within the tank and the gravel trench surrounding the tank. The total required storage of 7,023 CF will be stored in 33 storage chambers (33 x 215.1 CF = 7,098 CF).

The proposed detention system was modeled and routed in CivilD to determine the peak outflow and storage capacity of the system. The proposed system volume of 7,100 CF (0.163 AC-FT) was input as the capacity of the system. A 6” overflow weir will have a capacity of approximately 0.2 CFS and was input as the maximum outflow capacity.

In order to model the hydrograph volume without infiltration of the proposed site, a manual hydrograph was created within the routing model by inputting 23.41 CFS over a 5-minute period [(7,023 CF / 5 min) x (1 min / 60 s) = 23.41 CFS]. The routing model found the storage system adequate to store 7,023 CF without overtopping. The maximum outflow of the system was found to be 0.2 CFS. Note that this calculation is conservative since it assumes that the entire stormwater volume enters the storage system in the first 5 minutes of the storm. Also, infiltration of the system and proposed development was not taken into consideration, leading to further conservative results.

CONCLUSION

The purpose of this drainage analysis is to ensure that the proposed drainage system is designed to accept and convey onsite flows through the project site in a safe and non-destructive manner while adhering to the regional and local design requirements.

The San Diego County requirements of mitigating for hydromodification for the fractional 2-year storm event and the 10-year storm event will be met by installing perforated underground storage chambers to detain post-development flows. The proposed hydromodification system mitigates onsite increased post-development flow rates by storing and infiltrating stormwater within the underground chambers. The underground chambers will control outflow via a 6” overflow structure.

The CivilD software and corresponding calculations shows that the proposed site reduces flow rates of the 10-year storm. The 10-year unit volume of 7,023 CF will be adequately stored in the proposed system. The 10-year flow rate of 0.4 CFS will be reduced to a maximum outflow of 0.2 CFS coming out of the storage system. The proposed onsite stormwater system was designed to mitigate for the required storms and will bypass higher storms without damage to property. The proposed system will also capture and convey offsite flows to bypass through the site to safely perpetuate existing drainage conditions.

The 100-year peak flow of 1.1 cfs was modeled at a street cross slope of 2% (existing and proposed) and the existing minimum longitudinal street grade of 1%. The calculations demonstrate that the peak flows are contained within the proposed curb and existing street improvements. The maximum spread is approximately 10’ measured from back of curb. Flow shall be conveyed off-site via the proposed rolled curb and gutter to existing inlets lying north and south of the project site.

Appendix A

Hydrology Calculations – Existing Conditions

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 07/02/20

117.1574 - IDA AVE APARTMENTS
Existing Conditions
2 Year Storm

********* Hydrology Study Control Information **********

Program License Serial Number 6313

Rational hydrology study storm event year is 2.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 1.200
24 hour precipitation(inches) = 1.800
P6/P24 = 66.7%
Adjusted 6 hour precipitation (inches) = 1.170
Adjusted P6/P24 = 65.0%
San Diego hydrology manual 'C' values used

++

Process from Point/Station 100.000 to Point/Station 110.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
[UNDISTURBED NATURAL TERRAIN]
(Permanent Open Space)
Impervious value, Ai = 0.000
Sub-Area C Value = 0.200
Initial subarea total flow distance = 445.000(Ft.)
Highest elevation = 131.000(Ft.)
Lowest elevation = 99.000(Ft.)
Elevation difference = 32.000(Ft.) Slope = 7.191 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of 7.19 %, in a development type of
Permanent Open Space

```
      In Accordance With Figure 3-3
      Initial Area Time of Concentration =   8.39 minutes
      TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
      TC = [1.8*(1.1-0.2000)*( 100.000^.5)/(   7.191^(1/3)]=   8.39
      The initial area total distance of  445.00 (Ft.) entered leaves a
      remaining distance of  345.00 (Ft.)
      Using Figure 3-4, the travel time for this distance is   1.94
minutes
      for a distance of 345.00 (Ft.) and a slope of  7.19 %
      with an elevation difference of  24.81(Ft.) from the end of the top
area
      Tt = [11.9*length(Mi)^3)/(elevation change(Ft.))]^.385 *60(min/hr)
       =    1.936 Minutes
      Tt=[(11.9*0.0653^3)/( 24.81)]^.385=  1.94
      Total initial area Ti =   8.39 minutes from Figure 3-3 formula plus
        1.94 minutes from the Figure 3-4 formula =  10.33 minutes
      Rainfall intensity (I) =      1.931(In/Hr) for a     2.0 year storm
      Effective runoff coefficient used for area (Q=KCIA) is C = 0.200
      Subarea runoff =      0.255(CFS)
      Total initial stream area =        0.660(Ac.)


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+++
      Process from Point/Station      200.000 to Point/Station
210.000
      **** INITIAL AREA EVALUATION ****
      ____________________________________________________________________
___
      Decimal fraction soil group A = 1.000
      Decimal fraction soil group B = 0.000
      Decimal fraction soil group C = 0.000
      Decimal fraction soil group D = 0.000
      [UNDISTURBED NATURAL TERRAIN                ]
      (Permanent Open Space   )
      Impervious value, Ai = 0.000
      Sub-Area C Value = 0.200
      Initial subarea total flow distance  =  282.000(Ft.)
      Highest elevation =  131.000(Ft.)
      Lowest elevation =  109.000(Ft.)
      Elevation difference =   22.000(Ft.) Slope =  7.801 %
      INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
      The maximum overland flow distance is 100.00 (Ft)
      for the top area slope value of   7.80 %, in a development type of
       Permanent Open Space
      In Accordance With Figure 3-3
      Initial Area Time of Concentration =   8.17 minutes
      TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
      TC = [1.8*(1.1-0.2000)*( 100.000^.5)/(   7.800^(1/3)]=   8.17
      The initial area total distance of  282.00 (Ft.) entered leaves a
      remaining distance of  182.00 (Ft.)
      Using Figure 3-4, the travel time for this distance is   1.15
minutes
      for a distance of 182.00 (Ft.) and a slope of  7.80 %
```

```
      with an elevation difference of  14.20(Ft.) from the end of the top
area
      Tt = [11.9*length(Mi)^3)/(elevation change(Ft.))]^.385 *60(min/hr)
       =    1.147 Minutes
      Tt=[(11.9*0.0345^3)/( 14.20)]^.385=  1.15
      Total initial area Ti =   8.17 minutes from Figure 3-3 formula plus
        1.15 minutes from the Figure 3-4 formula =   9.32 minutes
      Rainfall intensity (I) =      2.064(In/Hr) for a     2.0 year storm
      Effective runoff coefficient used for area (Q=KCIA) is C = 0.200
      Subarea runoff =      0.206(CFS)
      Total initial stream area =        0.510(Ac.)
      End of computations, total study area =           1.170 (Ac.)
```

```
                San Diego County Rational Hydrology Program

      CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

      Rational method hydrology  program based on
      San Diego County Flood Control Division 2003 hydrology manual
            Rational Hydrology Study        Date: 07/02/20
      ------------------------------------------------------------------------
-----
      117.1574 - IDA AVE APARTMENT
      Existing Conditions
      10 Year Storm
      ------------------------------------------------------------------------
-----
       *********   Hydrology Study Control Information *********
      ------------------------------------------------------------------------
-----
      Program License Serial Number 6313
      ------------------------------------------------------------------------
-----
      Rational hydrology study storm event year is    10.0
      English (in-lb) input data Units used

      Map data precipitation entered:
      6 hour,  precipitation(inches) =  1.600
      24 hour precipitation(inches) =  3.000
      P6/P24 =    53.3%
      San Diego hydrology manual 'C' values used

      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+++
      Process from Point/Station      100.000 to Point/Station
110.000
      **** INITIAL AREA EVALUATION ****
      ________________________________________________________________________
___
      Decimal fraction soil group A = 1.000
      Decimal fraction soil group B = 0.000
      Decimal fraction soil group C = 0.000
      Decimal fraction soil group D = 0.000
      [UNDISTURBED NATURAL TERRAIN                ]
      (Permanent Open Space   )
      Impervious value, Ai = 0.000
      Sub-Area C Value = 0.200
      Initial subarea total flow distance  =  445.000(Ft.)
      Highest elevation =  131.000(Ft.)
      Lowest elevation =   99.000(Ft.)
      Elevation difference =   32.000(Ft.) Slope =  7.191 %
      INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
      The maximum overland flow distance is 100.00 (Ft)
      for the top area slope value of   7.19 %, in a development type of
       Permanent Open Space
      In Accordance With Figure 3-3
      Initial Area Time of Concentration =   8.39 minutes
```

```
      TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
      TC = [1.8*(1.1-0.2000)*( 100.000^.5)/(   7.191^(1/3)]=   8.39
      The initial area total distance of  445.00 (Ft.) entered leaves a
      remaining distance of  345.00 (Ft.)
      Using Figure 3-4, the travel time for this distance is   1.94
minutes
      for a distance of 345.00 (Ft.) and a slope of  7.19 %
      with an elevation difference of  24.81(Ft.) from the end of the top
area
      Tt = [11.9*length(Mi)^3)/(elevation change(Ft.))]^.385 *60(min/hr)
       =    1.936 Minutes
      Tt=[(11.9*0.0653^3)/( 24.81)]^.385=  1.94
      Total initial area Ti =   8.39 minutes from Figure 3-3 formula plus
        1.94 minutes from the Figure 3-4 formula =  10.33 minutes
      Rainfall intensity (I) =      2.640(In/Hr) for a    10.0 year storm
      Effective runoff coefficient used for area (Q=KCIA) is C = 0.200
      Subarea runoff =      0.349(CFS)
      Total initial stream area =        0.660(Ac.)

      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+++
      Process from Point/Station      200.000 to Point/Station
210.000
      **** INITIAL AREA EVALUATION ****
      ____________________________________________________________________
___
      Decimal fraction soil group A = 1.000
      Decimal fraction soil group B = 0.000
      Decimal fraction soil group C = 0.000
      Decimal fraction soil group D = 0.000
      [UNDISTURBED NATURAL TERRAIN                ]
      (Permanent Open Space   )
      Impervious value, Ai = 0.000
      Sub-Area C Value = 0.200
      Initial subarea total flow distance  =  282.000(Ft.)
      Highest elevation =  131.000(Ft.)
      Lowest elevation =  109.000(Ft.)
      Elevation difference =   22.000(Ft.) Slope =  7.801 %
      INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
      The maximum overland flow distance is 100.00 (Ft)
      for the top area slope value of   7.80 %, in a development type of
       Permanent Open Space
      In Accordance With Figure 3-3
      Initial Area Time of Concentration =   8.17 minutes
      TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
      TC = [1.8*(1.1-0.2000)*( 100.000^.5)/(   7.800^(1/3)]=   8.17
      The initial area total distance of  282.00 (Ft.) entered leaves a
      remaining distance of  182.00 (Ft.)
      Using Figure 3-4, the travel time for this distance is   1.15
minutes
      for a distance of 182.00 (Ft.) and a slope of  7.80 %
      with an elevation difference of  14.20(Ft.) from the end of the top
area
      Tt = [11.9*length(Mi)^3)/(elevation change(Ft.))]^.385 *60(min/hr)
```

```
 =    1.147 Minutes
Tt=[(11.9*0.0345^3)/( 14.20)]^.385=  1.15
Total initial area Ti =   8.17 minutes from Figure 3-3 formula plus
  1.15 minutes from the Figure 3-4 formula =   9.32 minutes
Rainfall intensity (I) =      2.822(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.200
Subarea runoff =      0.282(CFS)
Total initial stream area =        0.510(Ac.)
End of computations, total study area =           1.170 (Ac.)
```

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 07/02/20

117.1574 IDA AVE APARTMENTS
Existing Conditions
100 Year

********* Hydrology Study Control Information **********

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.500
24 hour precipitation(inches) = 4.000
P6/P24 = 62.5%
San Diego hydrology manual 'C' values used

++
Process from Point/Station 100.000 to Point/Station 110.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
[UNDISTURBED NATURAL TERRAIN]
(Permanent Open Space)
Impervious value, Ai = 0.000
Sub-Area C Value = 0.200
Initial subarea total flow distance = 445.000(Ft.)
Highest elevation = 131.000(Ft.)
Lowest elevation = 99.000(Ft.)
Elevation difference = 32.000(Ft.) Slope = 7.191 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of 7.19 %, in a development type of
Permanent Open Space
In Accordance With Figure 3-3
Initial Area Time of Concentration = 8.39 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.2000)*(100.000^.5)/(7.191^(1/3)]= 8.39
The initial area total distance of 445.00 (Ft.) entered leaves a
remaining distance of 345.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 1.94 minutes
for a distance of 345.00 (Ft.) and a slope of 7.19 %
with an elevation difference of 24.81(Ft.) from the end of the top area

```
Tt = [11.9*length(Mi)^3)/(elevation change(Ft.))]^.385 *60(min/hr)
 =    1.936 Minutes
Tt=[(11.9*0.0653^3)/( 24.81)]^.385=  1.94
Total initial area Ti =   8.39 minutes from Figure 3-3 formula plus
  1.94 minutes from the Figure 3-4 formula =  10.33 minutes
Rainfall intensity (I) =      4.125(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.200
Subarea runoff =      0.545(CFS)
Total initial stream area =        0.660(Ac.)

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      200.000 to Point/Station      210.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
[UNDISTURBED NATURAL TERRAIN                ]
(Permanent Open Space   )
Impervious value, Ai = 0.000
Sub-Area C Value = 0.200
Initial subarea total flow distance  =  282.000(Ft.)
Highest elevation =  131.000(Ft.)
Lowest elevation =  109.000(Ft.)
Elevation difference =   22.000(Ft.) Slope =  7.801 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of   7.80 %, in a development type of
 Permanent Open Space
In Accordance With Figure 3-3
Initial Area Time of Concentration =   8.17 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.2000)*( 100.000^.5)/(   7.800^(1/3)]=   8.17
The initial area total distance of  282.00 (Ft.) entered leaves a
remaining distance of  182.00 (Ft.)
Using Figure 3-4, the travel time for this distance is   1.15 minutes
for a distance of 182.00 (Ft.) and a slope of  7.80 %
with an elevation difference of  14.20(Ft.) from the end of the top area
Tt = [11.9*length(Mi)^3)/(elevation change(Ft.))]^.385 *60(min/hr)
 =    1.147 Minutes
Tt=[(11.9*0.0345^3)/( 14.20)]^.385=  1.15
Total initial area Ti =   8.17 minutes from Figure 3-3 formula plus
  1.15 minutes from the Figure 3-4 formula =   9.32 minutes
Rainfall intensity (I) =      4.409(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.200
Subarea runoff =      0.441(CFS)
Total initial stream area =        0.510(Ac.)
End of computations, total study area =           1.170 (Ac.)
```

U N I T H Y D R O G R A P H A N A L Y S I S

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Study date 02/05/18 File: 1574UHEXIST.out

++
Program License Serial Number 6313

10-YEAR UNIT HYDROGRAPH
SITE - EXISTING CONDITIONS
117.1574 - IDA AVE APARTMENTS
ARMSTRONG & BROOKS

++

Storm Event Year = 10

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

Area averaged rainfall isohyetal data:

Sub-Area(Ac.)	Rainfall (In)
1.17	3.00

Rainfall Distribution pattern used in study:
Type B for San Diego area of California

++

********* Area-Averaged SCS Curve Number and Fm *********

Area (Ac.)	Area fract	SCS CN (AMC2)	SCS CN (AMC2)	Fm (In/Hr)	Soil Group
1.05	0.900	40.0	40.0	0.050	B
0.12	0.100	98.0	98.0		

Area-averaged catchment SCS Curve Number AMC(2) = 45.800
Area-averaged Fm value using values listed = 0.045(In/Hr)
++
User entry of time of concentration = 0.192 (hours)
Watershed area = 1.17(Ac.)
Catchment Lag time = 0.115 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 72.3380
Hydrograph baseflow = 0.00(CFS)
Minimum watershed loss rate(Fm) = 0.100(In/Hr)
Average adjusted SCS Curve Number = 45.800

Rainfall depth area reduction factors:
Using a total area of 1.17(Ac.) (Ref: SCS Sup A, Sec.4)

Pacific Coastal Climate ratio used
Areal factor ratio (rainfall reduction) = 1.000
Rainfall entered for study = 3.000(In)
Adjusted rainfall = 3.000(In)
++

The following unit hydrograph was developed using an S-Graph interpolated by time percentage of lag time vs. percentage of peak flow. The S-Graphs for Valley, Foothill, and Mountain were developed by the U.S. Army Corps of Engineers for use in the respective type of basins located in Southern California. (Hydrology San Gabrial River ... U.S. Engineer Office, Dec 1944, revised Jul 1946) The Desert S-Graph is from Report ... on ... Tahquitz Creek, California, same U.S. offfice, Corps of Engineers, June 1963. The Valley Developed S-Graph is used by Orange and San Bernardino counties in California to represent the characteristics of valley areas with a large amount of development. Because of the wide variety in topography in Southern California, these synthetic unit hydrographs were included for use as options in any geographic location.

The SCS(Soil Conservation Service Dimensionless S-Graph, SCS handbook, of 1972, applies to a broad cross section of geographic locations and hydrologic regions.

The User Defined hydrograph converts the user Q/Qp vs. T/Tp values into an S-Graph based on lag = Tp/0.9. Then, for the lag time used, the S-Graph in interpolated in time % of lag.

The following S-Graph or S-Graph combination is used in this study:

FOOTHILL S-Graph

U N I T H Y D R O G R A P H

++

Time Ratio (t/Lag)	Time (hrs)	Discharge Ratios (Q/Qp)	Q (CFS)	Mass Curve Ratios (Qa/Q)
(K = 12.10 (CFS))				
0.72	0.083	0.176	0.915	0.076
1.45	0.167	1.000	5.200	0.505
2.17	0.250	0.650	3.378	0.785
2.89	0.333	0.248	1.287	0.891
3.62	0.417	0.134	0.698	0.949
4.34	0.500	0.066	0.343	0.977
5.06	0.583	0.023	0.121	0.987
5.79	0.667	0.013	0.069	0.993

6.51	0.750	0.011	0.058	0.997
7.23	0.833	0.006	0.031	1.000

For each time interval of the 6 or 24 hour storm, the total rainfall up to that storm time is calculated. Then the Soil Conservation Service SCS (report 1972, 1975) area averaged Curve Number (CN) is used to determine the amount of direct runoff in (In) using the following equations:

$$Q = \frac{(P - Ia)^2}{P - Ia + S}$$

Where:
Q = direct runoff, P = depth of precipitation, Ia = Initial Abstraction and S is the watershed storage in inches. S and Ia are given by the following equations:

$$S = \frac{1000}{CN} - 10 \quad \text{and} \quad Ia = 0.2\ S$$

Note: If Metric (SI) Units are used, rainfall data is converted by the program internally into inches for these calculations.

Note: In the following printout, the revised runoff column is only used when the minimum soil loss rate, fm, exceeds the normal loss rate of delta P(dP) - delta Q(dQ) then the dP-dQ column equals fm = 0.100(In) (for time interval = 0.008(In)) and the revised runoff is shown in the last column.

Time Period (hours)	Total Rainfall (In) P	Total SCS Runoff (In) Q	Rainfall Amount (In) dP	Runoff Amount (In) dQ	Infiltr-ation (In) dP-dQ	Revised Runoff Min Loss Rate
0.08	0.0045	0.0000	0.0045	--------	0.0083	0.0000
0.17	0.0090	0.0000	0.0045	--------	0.0083	0.0000
0.25	0.0135	0.0000	0.0045	--------	0.0083	0.0000
0.33	0.0180	0.0000	0.0045	--------	0.0083	0.0000
0.42	0.0225	0.0000	0.0045	--------	0.0083	0.0000
0.50	0.0270	0.0000	0.0045	--------	0.0083	0.0000
0.58	0.0305	0.0000	0.0035	--------	0.0083	0.0000
0.67	0.0340	0.0000	0.0035	--------	0.0083	0.0000
0.75	0.0375	0.0000	0.0035	--------	0.0083	0.0000
0.83	0.0410	0.0000	0.0035	--------	0.0083	0.0000
0.92	0.0445	0.0000	0.0035	--------	0.0083	0.0000
1.00	0.0480	0.0000	0.0035	--------	0.0083	0.0000
1.08	0.0525	0.0000	0.0045	--------	0.0083	0.0000
1.17	0.0570	0.0000	0.0045	--------	0.0083	0.0000

1.25	0.0615	0.0000	0.0045	--------	0.0083	0.0000
1.33	0.0660	0.0000	0.0045	--------	0.0083	0.0000
1.42	0.0705	0.0000	0.0045	--------	0.0083	0.0000
1.50	0.0750	0.0000	0.0045	--------	0.0083	0.0000
1.58	0.0795	0.0000	0.0045	--------	0.0083	0.0000
1.67	0.0840	0.0000	0.0045	--------	0.0083	0.0000
1.75	0.0885	0.0000	0.0045	--------	0.0083	0.0000
1.83	0.0930	0.0000	0.0045	--------	0.0083	0.0000
1.92	0.0975	0.0000	0.0045	--------	0.0083	0.0000
2.00	0.1020	0.0000	0.0045	--------	0.0083	0.0000
2.08	0.1075	0.0000	0.0055	--------	0.0083	0.0000
2.17	0.1130	0.0000	0.0055	--------	0.0083	0.0000
2.25	0.1185	0.0000	0.0055	--------	0.0083	0.0000
2.33	0.1240	0.0000	0.0055	--------	0.0083	0.0000
2.42	0.1295	0.0000	0.0055	--------	0.0083	0.0000
2.50	0.1350	0.0000	0.0055	--------	0.0083	0.0000
2.58	0.1395	0.0000	0.0045	--------	0.0083	0.0000
2.67	0.1440	0.0000	0.0045	--------	0.0083	0.0000
2.75	0.1485	0.0000	0.0045	--------	0.0083	0.0000
2.83	0.1530	0.0000	0.0045	--------	0.0083	0.0000
2.92	0.1575	0.0000	0.0045	--------	0.0083	0.0000
3.00	0.1620	0.0000	0.0045	--------	0.0083	0.0000
3.08	0.1675	0.0000	0.0055	--------	0.0083	0.0000
3.17	0.1730	0.0000	0.0055	--------	0.0083	0.0000
3.25	0.1785	0.0000	0.0055	--------	0.0083	0.0000
3.33	0.1840	0.0000	0.0055	--------	0.0083	0.0000
3.42	0.1895	0.0000	0.0055	--------	0.0083	0.0000
3.50	0.1950	0.0000	0.0055	--------	0.0083	0.0000
3.58	0.2010	0.0000	0.0060	--------	0.0083	0.0000
3.67	0.2070	0.0000	0.0060	--------	0.0083	0.0000
3.75	0.2130	0.0000	0.0060	--------	0.0083	0.0000
3.83	0.2190	0.0000	0.0060	--------	0.0083	0.0000
3.92	0.2250	0.0000	0.0060	--------	0.0083	0.0000
4.00	0.2310	0.0000	0.0060	--------	0.0083	0.0000
4.08	0.2375	0.0000	0.0065	--------	0.0083	0.0000
4.17	0.2440	0.0000	0.0065	--------	0.0083	0.0000
4.25	0.2505	0.0000	0.0065	--------	0.0083	0.0000
4.33	0.2570	0.0000	0.0065	--------	0.0083	0.0000
4.42	0.2635	0.0000	0.0065	--------	0.0083	0.0000
4.50	0.2700	0.0000	0.0065	--------	0.0083	0.0000
4.58	0.2770	0.0000	0.0070	--------	0.0083	0.0000
4.67	0.2840	0.0000	0.0070	--------	0.0083	0.0000
4.75	0.2910	0.0000	0.0070	--------	0.0083	0.0000
4.83	0.2980	0.0000	0.0070	--------	0.0083	0.0000
4.92	0.3050	0.0000	0.0070	--------	0.0083	0.0000
5.00	0.3120	0.0000	0.0070	--------	0.0083	0.0000
5.08	0.3200	0.0000	0.0080	--------	0.0083	0.0000
5.17	0.3280	0.0000	0.0080	--------	0.0083	0.0000
5.25	0.3360	0.0000	0.0080	--------	0.0083	0.0000
5.33	0.3440	0.0000	0.0080	--------	0.0083	0.0000
5.42	0.3520	0.0000	0.0080	--------	0.0083	0.0000
5.50	0.3600	0.0000	0.0080	--------	0.0083	0.0000
5.58	0.3685	0.0000	0.0085	0.0000	0.0085	--------
5.67	0.3770	0.0000	0.0085	0.0000	0.0085	--------

5.75	0.3855	0.0000	0.0085	0.0000	0.0085	--------
5.83	0.3940	0.0000	0.0085	0.0000	0.0085	--------
5.92	0.4025	0.0000	0.0085	0.0000	0.0085	--------
6.00	0.4110	0.0000	0.0085	0.0000	0.0085	--------
6.08	0.4210	0.0000	0.0100	0.0000	0.0100	--------
6.17	0.4310	0.0000	0.0100	0.0000	0.0100	--------
6.25	0.4410	0.0000	0.0100	0.0000	0.0100	--------
6.33	0.4510	0.0000	0.0100	0.0000	0.0100	--------
6.42	0.4610	0.0000	0.0100	0.0000	0.0100	--------
6.50	0.4710	0.0000	0.0100	0.0000	0.0100	--------
6.58	0.4825	0.0000	0.0115	0.0000	0.0115	--------
6.67	0.4940	0.0000	0.0115	0.0000	0.0115	--------
6.75	0.5055	0.0000	0.0115	0.0000	0.0115	--------
6.83	0.5170	0.0000	0.0115	0.0000	0.0115	--------
6.92	0.5285	0.0000	0.0115	0.0000	0.0115	--------
7.00	0.5400	0.0000	0.0115	0.0000	0.0115	--------
7.08	0.5550	0.0000	0.0150	0.0000	0.0150	--------
7.17	0.5700	0.0000	0.0150	0.0000	0.0150	--------
7.25	0.5850	0.0000	0.0150	0.0000	0.0150	--------
7.33	0.6000	0.0000	0.0150	0.0000	0.0150	--------
7.42	0.6150	0.0000	0.0150	0.0000	0.0150	--------
7.50	0.6300	0.0000	0.0150	0.0000	0.0150	--------
7.58	0.6525	0.0000	0.0225	0.0000	0.0225	--------
7.67	0.6750	0.0000	0.0225	0.0000	0.0225	--------
7.75	0.6975	0.0000	0.0225	0.0000	0.0225	--------
7.83	0.7200	0.0000	0.0225	0.0000	0.0225	--------
7.92	0.7425	0.0000	0.0225	0.0000	0.0225	--------
8.00	0.7650	0.0000	0.0225	0.0000	0.0225	--------
8.08	0.7985	0.0000	0.0335	0.0000	0.0335	--------
8.17	0.8320	0.0000	0.0335	0.0000	0.0335	--------
8.25	0.8655	0.0000	0.0335	0.0000	0.0335	--------
8.33	0.8990	0.0000	0.0335	0.0000	0.0335	--------
8.42	0.9325	0.0000	0.0335	0.0000	0.0335	--------
8.50	0.9660	0.0000	0.0335	0.0000	0.0335	--------
8.58	1.0100	0.0000	0.0440	0.0000	0.0440	--------
8.67	1.0540	0.0000	0.0440	0.0000	0.0440	--------
8.75	1.0980	0.0000	0.0440	0.0000	0.0440	--------
8.83	1.1420	0.0000	0.0440	0.0000	0.0440	--------
8.92	1.1860	0.0000	0.0440	0.0000	0.0440	--------
9.00	1.2300	0.0000	0.0440	0.0000	0.0440	--------
9.08	1.2780	0.0000	0.0480	0.0000	0.0480	--------
9.17	1.3260	0.0000	0.0480	0.0000	0.0480	--------
9.25	1.3740	0.0000	0.0480	0.0000	0.0480	--------
9.33	1.4220	0.0000	0.0480	0.0000	0.0480	--------
9.42	1.4700	0.0000	0.0480	0.0000	0.0480	--------
9.50	1.5180	0.0000	0.0480	0.0000	0.0480	--------
9.58	1.5590	0.0000	0.0410	0.0000	0.0410	--------
9.67	1.6000	0.0000	0.0410	0.0000	0.0410	--------
9.75	1.6410	0.0000	0.0410	0.0000	0.0410	--------
9.83	1.6820	0.0000	0.0410	0.0000	0.0410	--------
9.92	1.7230	0.0000	0.0410	0.0000	0.0410	--------
10.00	1.7640	0.0000	0.0410	0.0000	0.0410	--------
10.08	1.7845	0.0000	0.0205	0.0000	0.0205	--------
10.17	1.8050	0.0000	0.0205	0.0000	0.0205	--------

10.25	1.8255	0.0000	0.0205	0.0000	0.0205	--------
10.33	1.8460	0.0000	0.0205	0.0000	0.0205	--------
10.42	1.8665	0.0000	0.0205	0.0000	0.0205	--------
10.50	1.8870	0.0000	0.0205	0.0000	0.0205	--------
10.58	1.9005	0.0000	0.0135	0.0000	0.0135	--------
10.67	1.9140	0.0000	0.0135	0.0000	0.0135	--------
10.75	1.9275	0.0000	0.0135	0.0000	0.0135	--------
10.83	1.9410	0.0000	0.0135	0.0000	0.0135	--------
10.92	1.9545	0.0000	0.0135	0.0000	0.0135	--------
11.00	1.9680	0.0000	0.0135	0.0000	0.0135	--------
11.08	1.9795	0.0000	0.0115	0.0000	0.0115	--------
11.17	1.9910	0.0000	0.0115	0.0000	0.0115	--------
11.25	2.0025	0.0000	0.0115	0.0000	0.0115	--------
11.33	2.0140	0.0000	0.0115	0.0000	0.0115	--------
11.42	2.0255	0.0000	0.0115	0.0000	0.0115	--------
11.50	2.0370	0.0000	0.0115	0.0000	0.0115	--------
11.58	2.0475	0.0000	0.0105	0.0000	0.0105	--------
11.67	2.0580	0.0000	0.0105	0.0000	0.0105	--------
11.75	2.0685	0.0000	0.0105	0.0000	0.0105	--------
11.83	2.0790	0.0000	0.0105	0.0000	0.0105	--------
11.92	2.0895	0.0000	0.0105	0.0000	0.0105	--------
12.00	2.1000	0.0000	0.0105	0.0000	0.0105	--------
12.08	2.1100	0.0000	0.0100	0.0000	0.0100	--------
12.17	2.1200	0.0000	0.0100	0.0000	0.0100	--------
12.25	2.1300	0.0000	0.0100	0.0000	0.0100	--------
12.33	2.1400	0.0000	0.0100	0.0000	0.0100	--------
12.42	2.1500	0.0000	0.0100	0.0000	0.0100	--------
12.50	2.1600	0.0000	0.0100	0.0000	0.0100	--------
12.58	2.1695	0.0000	0.0095	0.0000	0.0095	--------
12.67	2.1790	0.0000	0.0095	0.0000	0.0095	--------
12.75	2.1885	0.0000	0.0095	0.0000	0.0095	--------
12.83	2.1980	0.0000	0.0095	0.0000	0.0095	--------
12.92	2.2075	0.0000	0.0095	0.0000	0.0095	--------
13.00	2.2170	0.0000	0.0095	0.0000	0.0095	--------
13.08	2.2255	0.0000	0.0085	0.0000	0.0085	--------
13.17	2.2340	0.0000	0.0085	0.0000	0.0085	--------
13.25	2.2425	0.0000	0.0085	0.0000	0.0085	--------
13.33	2.2510	0.0000	0.0085	0.0000	0.0085	--------
13.42	2.2595	0.0000	0.0085	0.0000	0.0085	--------
13.50	2.2680	0.0000	0.0085	0.0000	0.0085	--------
13.58	2.2760	0.0000	0.0080	--------	0.0083	0.0000
13.67	2.2840	0.0000	0.0080	--------	0.0083	0.0000
13.75	2.2920	0.0000	0.0080	--------	0.0083	0.0000
13.83	2.3000	0.0000	0.0080	--------	0.0083	0.0000
13.92	2.3080	0.0000	0.0080	--------	0.0083	0.0000
14.00	2.3160	0.0000	0.0080	--------	0.0083	0.0000
14.08	2.3250	0.0000	0.0090	0.0000	0.0090	--------
14.17	2.3340	0.0000	0.0090	0.0000	0.0090	--------
14.25	2.3430	0.0000	0.0090	0.0000	0.0090	--------
14.33	2.3520	0.0000	0.0090	0.0000	0.0090	--------
14.42	2.3610	0.0000	0.0090	0.0000	0.0090	--------
14.50	2.3700	0.0000	0.0090	0.0000	0.0090	--------
14.58	2.3750	0.0000	0.0050	--------	0.0083	0.0000
14.67	2.3800	0.0000	0.0050	--------	0.0083	0.0000

14.75	2.3850	0.0000	0.0050	--------	0.0083	0.0000
14.83	2.3900	0.0000	0.0050	--------	0.0083	0.0000
14.92	2.3950	0.0001	0.0050	--------	0.0083	0.0000
15.00	2.4000	0.0001	0.0050	--------	0.0083	0.0000
15.08	2.4080	0.0001	0.0080	--------	0.0083	0.0000
15.17	2.4160	0.0002	0.0080	--------	0.0083	0.0000
15.25	2.4240	0.0003	0.0080	--------	0.0083	0.0000
15.33	2.4320	0.0004	0.0080	--------	0.0083	0.0000
15.42	2.4400	0.0004	0.0080	--------	0.0083	0.0000
15.50	2.4480	0.0006	0.0080	--------	0.0083	0.0000
15.58	2.4555	0.0007	0.0075	--------	0.0083	0.0000
15.67	2.4630	0.0008	0.0075	--------	0.0083	0.0000
15.75	2.4705	0.0009	0.0075	--------	0.0083	0.0000
15.83	2.4780	0.0010	0.0075	--------	0.0083	0.0000
15.92	2.4855	0.0012	0.0075	--------	0.0083	0.0000
16.00	2.4930	0.0013	0.0075	--------	0.0083	0.0000
16.08	2.5000	0.0015	0.0070	--------	0.0083	0.0000
16.17	2.5070	0.0016	0.0070	--------	0.0083	0.0000
16.25	2.5140	0.0018	0.0070	--------	0.0083	0.0000
16.33	2.5210	0.0020	0.0070	--------	0.0083	0.0000
16.42	2.5280	0.0022	0.0070	--------	0.0083	0.0000
16.50	2.5350	0.0024	0.0070	--------	0.0083	0.0000
16.58	2.5425	0.0026	0.0075	--------	0.0083	0.0000
16.67	2.5500	0.0028	0.0075	--------	0.0083	0.0000
16.75	2.5575	0.0030	0.0075	--------	0.0083	0.0000
16.83	2.5650	0.0033	0.0075	--------	0.0083	0.0000
16.92	2.5725	0.0035	0.0075	--------	0.0083	0.0000
17.00	2.5800	0.0038	0.0075	--------	0.0083	0.0000
17.08	2.5860	0.0040	0.0060	--------	0.0083	0.0000
17.17	2.5920	0.0042	0.0060	--------	0.0083	0.0000
17.25	2.5980	0.0044	0.0060	--------	0.0083	0.0000
17.33	2.6040	0.0047	0.0060	--------	0.0083	0.0000
17.42	2.6100	0.0049	0.0060	--------	0.0083	0.0000
17.50	2.6160	0.0051	0.0060	--------	0.0083	0.0000
17.58	2.6225	0.0054	0.0065	--------	0.0083	0.0000
17.67	2.6290	0.0057	0.0065	--------	0.0083	0.0000
17.75	2.6355	0.0060	0.0065	--------	0.0083	0.0000
17.83	2.6420	0.0063	0.0065	--------	0.0083	0.0000
17.92	2.6485	0.0065	0.0065	--------	0.0083	0.0000
18.00	2.6550	0.0069	0.0065	--------	0.0083	0.0000
18.08	2.6600	0.0071	0.0050	--------	0.0083	0.0000
18.17	2.6650	0.0073	0.0050	--------	0.0083	0.0000
18.25	2.6700	0.0076	0.0050	--------	0.0083	0.0000
18.33	2.6750	0.0078	0.0050	--------	0.0083	0.0000
18.42	2.6800	0.0081	0.0050	--------	0.0083	0.0000
18.50	2.6850	0.0083	0.0050	--------	0.0083	0.0000
18.58	2.6900	0.0086	0.0050	--------	0.0083	0.0000
18.67	2.6950	0.0089	0.0050	--------	0.0083	0.0000
18.75	2.7000	0.0091	0.0050	--------	0.0083	0.0000
18.83	2.7050	0.0094	0.0050	--------	0.0083	0.0000
18.92	2.7100	0.0097	0.0050	--------	0.0083	0.0000
19.00	2.7150	0.0100	0.0050	--------	0.0083	0.0000
19.08	2.7195	0.0102	0.0045	--------	0.0083	0.0000
19.17	2.7240	0.0105	0.0045	--------	0.0083	0.0000

19.25	2.7285	0.0107	0.0045	--------	0.0083	0.0000
19.33	2.7330	0.0110	0.0045	--------	0.0083	0.0000
19.42	2.7375	0.0113	0.0045	--------	0.0083	0.0000
19.50	2.7420	0.0115	0.0045	--------	0.0083	0.0000
19.58	2.7470	0.0118	0.0050	--------	0.0083	0.0000
19.67	2.7520	0.0121	0.0050	--------	0.0083	0.0000
19.75	2.7570	0.0125	0.0050	--------	0.0083	0.0000
19.83	2.7620	0.0128	0.0050	--------	0.0083	0.0000
19.92	2.7670	0.0131	0.0050	--------	0.0083	0.0000
20.00	2.7720	0.0134	0.0050	--------	0.0083	0.0000
20.08	2.7775	0.0138	0.0055	--------	0.0083	0.0000
20.17	2.7830	0.0141	0.0055	--------	0.0083	0.0000
20.25	2.7885	0.0145	0.0055	--------	0.0083	0.0000
20.33	2.7940	0.0149	0.0055	--------	0.0083	0.0000
20.42	2.7995	0.0153	0.0055	--------	0.0083	0.0000
20.50	2.8050	0.0156	0.0055	--------	0.0083	0.0000
20.58	2.8100	0.0160	0.0050	--------	0.0083	0.0000
20.67	2.8150	0.0164	0.0050	--------	0.0083	0.0000
20.75	2.8200	0.0167	0.0050	--------	0.0083	0.0000
20.83	2.8250	0.0171	0.0050	--------	0.0083	0.0000
20.92	2.8300	0.0174	0.0050	--------	0.0083	0.0000
21.00	2.8350	0.0178	0.0050	--------	0.0083	0.0000
21.08	2.8395	0.0182	0.0045	--------	0.0083	0.0000
21.17	2.8440	0.0185	0.0045	--------	0.0083	0.0000
21.25	2.8485	0.0188	0.0045	--------	0.0083	0.0000
21.33	2.8530	0.0192	0.0045	--------	0.0083	0.0000
21.42	2.8575	0.0195	0.0045	--------	0.0083	0.0000
21.50	2.8620	0.0199	0.0045	--------	0.0083	0.0000
21.58	2.8665	0.0202	0.0045	--------	0.0083	0.0000
21.67	2.8710	0.0206	0.0045	--------	0.0083	0.0000
21.75	2.8755	0.0210	0.0045	--------	0.0083	0.0000
21.83	2.8800	0.0213	0.0045	--------	0.0083	0.0000
21.92	2.8845	0.0217	0.0045	--------	0.0083	0.0000
22.00	2.8890	0.0221	0.0045	--------	0.0083	0.0000
22.08	2.8935	0.0224	0.0045	--------	0.0083	0.0000
22.17	2.8980	0.0228	0.0045	--------	0.0083	0.0000
22.25	2.9025	0.0232	0.0045	--------	0.0083	0.0000
22.33	2.9070	0.0236	0.0045	--------	0.0083	0.0000
22.42	2.9115	0.0240	0.0045	--------	0.0083	0.0000
22.50	2.9160	0.0244	0.0045	--------	0.0083	0.0000
22.58	2.9205	0.0247	0.0045	--------	0.0083	0.0000
22.67	2.9250	0.0251	0.0045	--------	0.0083	0.0000
22.75	2.9295	0.0255	0.0045	--------	0.0083	0.0000
22.83	2.9340	0.0259	0.0045	--------	0.0083	0.0000
22.92	2.9385	0.0263	0.0045	--------	0.0083	0.0000
23.00	2.9430	0.0268	0.0045	--------	0.0083	0.0000
23.08	2.9480	0.0272	0.0050	--------	0.0083	0.0000
23.17	2.9530	0.0277	0.0050	--------	0.0083	0.0000
23.25	2.9580	0.0281	0.0050	--------	0.0083	0.0000
23.33	2.9630	0.0286	0.0050	--------	0.0083	0.0000
23.42	2.9680	0.0291	0.0050	--------	0.0083	0.0000
23.50	2.9730	0.0295	0.0050	--------	0.0083	0.0000
23.58	2.9775	0.0300	0.0045	--------	0.0083	0.0000
23.67	2.9820	0.0304	0.0045	--------	0.0083	0.0000

23.75	2.9865	0.0308	0.0045	--------	0.0083	0.0000
23.83	2.9910	0.0313	0.0045	--------	0.0083	0.0000
23.92	2.9955	0.0317	0.0045	--------	0.0083	0.0000
24.00	3.0000	0.0322	0.0045	--------	0.0083	0.0000

Total soil rain loss = 3.00(In)
Total effective runoff = 0.00(In)

Peak flow rate this hydrograph = 0.00(CFS)
Total runoff volume this hydrograph = 0.0(Ft3)

++

24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0000	0.00	Q				
0+10	0.0000	0.00	Q				
0+15	0.0000	0.00	Q				
0+20	0.0000	0.00	Q				
0+25	0.0000	0.00	Q				
0+30	0.0000	0.00	Q				
0+35	0.0000	0.00	Q				
0+40	0.0000	0.00	Q				
0+45	0.0000	0.00	Q				
0+50	0.0000	0.00	Q				
0+55	0.0000	0.00	Q				
1+ 0	0.0000	0.00	Q				
1+ 5	0.0000	0.00	Q				
1+10	0.0000	0.00	Q				
1+15	0.0000	0.00	Q				
1+20	0.0000	0.00	Q				
1+25	0.0000	0.00	Q				
1+30	0.0000	0.00	Q				
1+35	0.0000	0.00	Q				
1+40	0.0000	0.00	Q				
1+45	0.0000	0.00	Q				
1+50	0.0000	0.00	Q				
1+55	0.0000	0.00	Q				
2+ 0	0.0000	0.00	Q				
2+ 5	0.0000	0.00	Q				
2+10	0.0000	0.00	Q				
2+15	0.0000	0.00	Q				
2+20	0.0000	0.00	Q				
2+25	0.0000	0.00	Q				
2+30	0.0000	0.00	Q				
2+35	0.0000	0.00	Q				
2+40	0.0000	0.00	Q				
2+45	0.0000	0.00	Q				

2+50	0.0000	0.00	Q				
2+55	0.0000	0.00	Q				
3+ 0	0.0000	0.00	Q				
3+ 5	0.0000	0.00	Q				
3+10	0.0000	0.00	Q				
3+15	0.0000	0.00	Q				
3+20	0.0000	0.00	Q				
3+25	0.0000	0.00	Q				
3+30	0.0000	0.00	Q				
3+35	0.0000	0.00	Q				
3+40	0.0000	0.00	Q				
3+45	0.0000	0.00	Q				
3+50	0.0000	0.00	Q				
3+55	0.0000	0.00	Q				
4+ 0	0.0000	0.00	Q				
4+ 5	0.0000	0.00	Q				
4+10	0.0000	0.00	Q				
4+15	0.0000	0.00	Q				
4+20	0.0000	0.00	Q				
4+25	0.0000	0.00	Q				
4+30	0.0000	0.00	Q				
4+35	0.0000	0.00	Q				
4+40	0.0000	0.00	Q				
4+45	0.0000	0.00	Q				
4+50	0.0000	0.00	Q				
4+55	0.0000	0.00	Q				
5+ 0	0.0000	0.00	Q				
5+ 5	0.0000	0.00	Q				
5+10	0.0000	0.00	Q				
5+15	0.0000	0.00	Q				
5+20	0.0000	0.00	Q				
5+25	0.0000	0.00	Q				
5+30	0.0000	0.00	Q				
5+35	0.0000	0.00	Q				
5+40	0.0000	0.00	Q				
5+45	0.0000	0.00	Q				
5+50	0.0000	0.00	Q				
5+55	0.0000	0.00	Q				
6+ 0	0.0000	0.00	Q				
6+ 5	0.0000	0.00	Q				
6+10	0.0000	0.00	Q				
6+15	0.0000	0.00	Q				
6+20	0.0000	0.00	Q				
6+25	0.0000	0.00	Q				
6+30	0.0000	0.00	Q				
6+35	0.0000	0.00	Q				
6+40	0.0000	0.00	Q				
6+45	0.0000	0.00	Q				
6+50	0.0000	0.00	Q				
6+55	0.0000	0.00	Q				
7+ 0	0.0000	0.00	Q				
7+ 5	0.0000	0.00	Q				
7+10	0.0000	0.00	Q				
7+15	0.0000	0.00	Q				

7+20	0.0000	0.00	Q				
7+25	0.0000	0.00	Q				
7+30	0.0000	0.00	Q				
7+35	0.0000	0.00	Q				
7+40	0.0000	0.00	Q				
7+45	0.0000	0.00	Q				
7+50	0.0000	0.00	Q				
7+55	0.0000	0.00	Q				
8+ 0	0.0000	0.00	Q				
8+ 5	0.0000	0.00	Q				
8+10	0.0000	0.00	Q				
8+15	0.0000	0.00	Q				
8+20	0.0000	0.00	Q				
8+25	0.0000	0.00	Q				
8+30	0.0000	0.00	Q				
8+35	0.0000	0.00	Q				
8+40	0.0000	0.00	Q				
8+45	0.0000	0.00	Q				
8+50	0.0000	0.00	Q				
8+55	0.0000	0.00	Q				
9+ 0	0.0000	0.00	Q				
9+ 5	0.0000	0.00	Q				
9+10	0.0000	0.00	Q				
9+15	0.0000	0.00	Q				
9+20	0.0000	0.00	Q				
9+25	0.0000	0.00	Q				
9+30	0.0000	0.00	Q				
9+35	0.0000	0.00	Q				
9+40	0.0000	0.00	Q				
9+45	0.0000	0.00	Q				
9+50	0.0000	0.00	Q				
9+55	0.0000	0.00	Q				
10+ 0	0.0000	0.00	Q				
10+ 5	0.0000	0.00	Q				
10+10	0.0000	0.00	Q				
10+15	0.0000	0.00	Q				
10+20	0.0000	0.00	Q				
10+25	0.0000	0.00	Q				
10+30	0.0000	0.00	Q				
10+35	0.0000	0.00	Q				
10+40	0.0000	0.00	Q				
10+45	0.0000	0.00	Q				
10+50	0.0000	0.00	Q				
10+55	0.0000	0.00	Q				
11+ 0	0.0000	0.00	Q				
11+ 5	0.0000	0.00	Q				
11+10	0.0000	0.00	Q				
11+15	0.0000	0.00	Q				
11+20	0.0000	0.00	Q				
11+25	0.0000	0.00	Q				
11+30	0.0000	0.00	Q				
11+35	0.0000	0.00	Q				
11+40	0.0000	0.00	Q				
11+45	0.0000	0.00	Q				

```
11+50       0.0000      0.00  Q          |          |          |          |
11+55       0.0000      0.00  Q          |          |          |          |
12+ 0       0.0000      0.00  Q          |          |          |          |
12+ 5       0.0000      0.00  Q          |          |          |          |
12+10       0.0000      0.00  Q          |          |          |          |
12+15       0.0000      0.00  Q          |          |          |          |
12+20       0.0000      0.00  Q          |          |          |          |
12+25       0.0000      0.00  Q          |          |          |          |
12+30       0.0000      0.00  Q          |          |          |          |
12+35       0.0000      0.00  Q          |          |          |          |
12+40       0.0000      0.00  Q          |          |          |          |
12+45       0.0000      0.00  Q          |          |          |          |
12+50       0.0000      0.00  Q          |          |          |          |
12+55       0.0000      0.00  Q          |          |          |          |
13+ 0       0.0000      0.00  Q          |          |          |          |
13+ 5       0.0000      0.00  Q          |          |          |          |
13+10       0.0000      0.00  Q          |          |          |          |
13+15       0.0000      0.00  Q          |          |          |          |
13+20       0.0000      0.00  Q          |          |          |          |
13+25       0.0000      0.00  Q          |          |          |          |
13+30       0.0000      0.00  Q          |          |          |          |
13+35       0.0000      0.00  Q          |          |          |          |
13+40       0.0000      0.00  Q          |          |          |          |
13+45       0.0000      0.00  Q          |          |          |          |
13+50       0.0000      0.00  Q          |          |          |          |
13+55       0.0000      0.00  Q          |          |          |          |
14+ 0       0.0000      0.00  Q          |          |          |          |
14+ 5       0.0000      0.00  Q          |          |          |          |
14+10       0.0000      0.00  Q          |          |          |          |
14+15       0.0000      0.00  Q          |          |          |          |
14+20       0.0000      0.00  Q          |          |          |          |
14+25       0.0000      0.00  Q          |          |          |          |
14+30       0.0000      0.00  Q  V       |          |          |          |
14+35       0.0000      0.00  Q          |          V          |          |
14+40       0.0000      0.00  Q          |          |          V          |
14+45       0.0000      0.00  Q          |          |          |    V     |
14+50       0.0000      0.00  Q          |          |          |      V   |
14+55       0.0000      0.00  Q          |          |          |        V |
15+ 0       0.0000      0.00  Q          |          |          |        V |
15+ 5       0.0000      0.00  Q          |          |          |        V |
15+10       0.0000      0.00  Q          |          |          |        V |
15+15       0.0000      0.00  Q          |          |          |        V |
15+20       0.0000      0.00  Q          |          |          |        V |
15+25       0.0000      0.00  Q          |          |          |        V |
15+30       0.0000      0.00  Q          |          |          |        V |
15+35       0.0000      0.00  Q          |          |          |        V |
15+40       0.0000      0.00  Q          |          |          |        V |
15+45       0.0000      0.00  Q          |          |          |        V |
15+50       0.0000      0.00  Q          |          |          |        V |
15+55       0.0000      0.00  Q          |          |          |        V |
16+ 0       0.0000      0.00  Q          |          |          |        V |
16+ 5       0.0000      0.00  Q          |          |          |        V |
16+10       0.0000      0.00  Q          |          |          |        V |
16+15       0.0000      0.00  Q          |          |          |        V |
```

16+20	0.0000	0.00	Q	|	|	|	V|
16+25	0.0000	0.00	Q	|	|	|	V|
16+30	0.0000	0.00	Q	|	|	|	V|
16+35	0.0000	0.00	Q	|	|	|	V|
16+40	0.0000	0.00	Q	|	|	|	V|
16+45	0.0000	0.00	Q	|	|	|	V|
16+50	0.0000	0.00	Q	|	|	|	V|
16+55	0.0000	0.00	Q	|	|	|	V|
17+ 0	0.0000	0.00	Q	|	|	|	V|
17+ 5	0.0000	0.00	Q	|	|	|	V|
17+10	0.0000	0.00	Q	|	|	|	V|
17+15	0.0000	0.00	Q	|	|	|	V|
17+20	0.0000	0.00	Q	|	|	|	V|
17+25	0.0000	0.00	Q	|	|	|	V|
17+30	0.0000	0.00	Q	|	|	|	V|
17+35	0.0000	0.00	Q	|	|	|	V|
17+40	0.0000	0.00	Q	|	|	|	V|
17+45	0.0000	0.00	Q	|	|	|	V|
17+50	0.0000	0.00	Q	|	|	|	V|
17+55	0.0000	0.00	Q	|	|	|	V|
18+ 0	0.0000	0.00	Q	|	|	|	V|
18+ 5	0.0000	0.00	Q	|	|	|	V|
18+10	0.0000	0.00	Q	|	|	|	V|
18+15	0.0000	0.00	Q	|	|	|	V|
18+20	0.0000	0.00	Q	|	|	|	V|
18+25	0.0000	0.00	Q	|	|	|	V|
18+30	0.0000	0.00	Q	|	|	|	V|
18+35	0.0000	0.00	Q	|	|	|	V|
18+40	0.0000	0.00	Q	|	|	|	V|
18+45	0.0000	0.00	Q	|	|	|	V|
18+50	0.0000	0.00	Q	|	|	|	V|
18+55	0.0000	0.00	Q	|	|	|	V|
19+ 0	0.0000	0.00	Q	|	|	|	V|
19+ 5	0.0000	0.00	Q	|	|	|	V|
19+10	0.0000	0.00	Q	|	|	|	V|
19+15	0.0000	0.00	Q	|	|	|	V|
19+20	0.0000	0.00	Q	|	|	|	V|
19+25	0.0000	0.00	Q	|	|	|	V|
19+30	0.0000	0.00	Q	|	|	|	V|
19+35	0.0000	0.00	Q	|	|	|	V|
19+40	0.0000	0.00	Q	|	|	|	V|
19+45	0.0000	0.00	Q	|	|	|	V|
19+50	0.0000	0.00	Q	|	|	|	V|
19+55	0.0000	0.00	Q	|	|	|	V|
20+ 0	0.0000	0.00	Q	|	|	|	V|
20+ 5	0.0000	0.00	Q	|	|	|	V|
20+10	0.0000	0.00	Q	|	|	|	V|
20+15	0.0000	0.00	Q	|	|	|	V|
20+20	0.0000	0.00	Q	|	|	|	V|
20+25	0.0000	0.00	Q	|	|	|	V|
20+30	0.0000	0.00	Q	|	|	|	V|
20+35	0.0000	0.00	Q	|	|	|	V|
20+40	0.0000	0.00	Q	|	|	|	V|
20+45	0.0000	0.00	Q	|	|	|	V|

20+50	0.0000	0.00	Q	|	|	|	V|
20+55	0.0000	0.00	Q	|	|	|	V|
21+ 0	0.0000	0.00	Q	|	|	|	V|
21+ 5	0.0000	0.00	Q	|	|	|	V|
21+10	0.0000	0.00	Q	|	|	|	V|
21+15	0.0000	0.00	Q	|	|	|	V|
21+20	0.0000	0.00	Q	|	|	|	V|
21+25	0.0000	0.00	Q	|	|	|	V|
21+30	0.0000	0.00	Q	|	|	|	V|
21+35	0.0000	0.00	Q	|	|	|	V|
21+40	0.0000	0.00	Q	|	|	|	V|
21+45	0.0000	0.00	Q	|	|	|	V|
21+50	0.0000	0.00	Q	|	|	|	V|
21+55	0.0000	0.00	Q	|	|	|	V|
22+ 0	0.0000	0.00	Q	|	|	|	V|
22+ 5	0.0000	0.00	Q	|	|	|	V|
22+10	0.0000	0.00	Q	|	|	|	V|
22+15	0.0000	0.00	Q	|	|	|	V|
22+20	0.0000	0.00	Q	|	|	|	V|
22+25	0.0000	0.00	Q	|	|	|	V|
22+30	0.0000	0.00	Q	|	|	|	V|
22+35	0.0000	0.00	Q	|	|	|	V|
22+40	0.0000	0.00	Q	|	|	|	V|
22+45	0.0000	0.00	Q	|	|	|	V|
22+50	0.0000	0.00	Q	|	|	|	V|
22+55	0.0000	0.00	Q	|	|	|	V|
23+ 0	0.0000	0.00	Q	|	|	|	V|
23+ 5	0.0000	0.00	Q	|	|	|	V|
23+10	0.0000	0.00	Q	|	|	|	V|
23+15	0.0000	0.00	Q	|	|	|	V|
23+20	0.0000	0.00	Q	|	|	|	V|
23+25	0.0000	0.00	Q	|	|	|	V|
23+30	0.0000	0.00	Q	|	|	|	V|
23+35	0.0000	0.00	Q	|	|	|	V|
23+40	0.0000	0.00	Q	|	|	|	V|
23+45	0.0000	0.00	Q	|	|	|	V|
23+50	0.0000	0.00	Q	|	|	|	V|
23+55	0.0000	0.00	Q	|	|	|	V|
24+ 0	0.0000	0.00	Q	|	|	|	V|
24+ 5	0.0000	0.00	Q	|	|	|	V|
24+10	0.0000	0.00	Q	|	|	|	V|
24+15	0.0000	0.00	Q	|	|	|	V|
24+20	0.0000	0.00	Q	|	|	|	V|
24+25	0.0000	0.00	Q	|	|	|	V|
24+30	0.0000	0.00	Q	|	|	|	V|
24+35	0.0000	0.00	Q	|	|	|	V|
24+40	0.0000	0.00	Q	|	|	|	V|
24+45	0.0000	0.00	Q	|	|	|	V|

Appendix B

Hydrology Calculations – Proposed Conditions

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 07/01/20

117.1574 IDA AVE APARTMENTS
Proposed Conditions
2-Year Storm

********* Hydrology Study Control Information **********

Program License Serial Number 6313

Rational hydrology study storm event year is 2.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 1.200
24 hour precipitation(inches) = 1.800
P6/P24 = 66.7%
Adjusted 6 hour precipitation (inches) = 1.170
Adjusted P6/P24 = 65.0%
San Diego hydrology manual 'C' values used

++
Process from Point/Station 100.000 to Point/Station 110.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
[MEDIUM DENSITY RESIDENTIAL]
(10.9 DU/A or Less)
Impervious value, Ai = 0.450
Sub-Area C Value = 0.530
Initial subarea total flow distance = 284.000(Ft.)
Highest elevation = 123.000(Ft.)
Lowest elevation = 99.000(Ft.)
Elevation difference = 24.000(Ft.) Slope = 8.451 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of 8.45 %, in a development type of
10.9 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration = 5.04 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.5300)*(100.000^.5)/(8.451^(1/3)]= 5.04
The initial area total distance of 284.00 (Ft.) entered leaves a
remaining distance of 184.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 1.12 minutes

```
for a distance of 184.00 (Ft.) and a slope of  8.45 %
with an elevation difference of  15.55(Ft.) from the end of the top area
Tt = [11.9*length(Mi)^3)/(elevation change(Ft.))]^.385 *60(min/hr)
 =    1.121 Minutes
Tt=[(11.9*0.0348^3)/( 15.55)]^.385=  1.12
Total initial area Ti =   5.04 minutes from Figure 3-3 formula plus
  1.12 minutes from the Figure 3-4 formula =   6.16 minutes
Rainfall intensity (I) =      2.695(In/Hr) for a     2.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.530
Subarea runoff =      0.129(CFS)
Total initial stream area =        0.090(Ac.)

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      200.000 to Point/Station      210.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
[MEDIUM DENSITY RESIDENTIAL                  ]
(10.9 DU/A or Less      )
Impervious value, Ai = 0.450
Sub-Area C Value = 0.530
Initial subarea total flow distance  =  367.000(Ft.)
Highest elevation =  115.250(Ft.)
Lowest elevation =   97.500(Ft.)
Elevation difference =   17.750(Ft.) Slope =  4.837 %
Top of Initial Area Slope adjusted by User to  4.800 %
Bottom of Initial Area Slope adjusted by User to  4.800 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of   4.80 %, in a development type of
 10.9 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration =   6.08 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.5300)*( 100.000^.5)/(   4.800^(1/3)]=   6.08
The initial area total distance of  367.00 (Ft.) entered leaves a
remaining distance of  267.00 (Ft.)
Using Figure 3-4, the travel time for this distance is   1.86 minutes
for a distance of 267.00 (Ft.) and a slope of  4.80 %
with an elevation difference of  12.82(Ft.) from the end of the top area
Tt = [11.9*length(Mi)^3)/(elevation change(Ft.))]^.385 *60(min/hr)
 =    1.857 Minutes
Tt=[(11.9*0.0506^3)/( 12.82)]^.385=  1.86
Total initial area Ti =   6.08 minutes from Figure 3-3 formula plus
  1.86 minutes from the Figure 3-4 formula =   7.94 minutes
Rainfall intensity (I) =      2.288(In/Hr) for a     2.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.530
Subarea runoff =      0.534(CFS)
Total initial stream area =        0.440(Ac.)
```

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      300.000 to Point/Station      310.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
[MEDIUM DENSITY RESIDENTIAL                  ]
(10.9 DU/A or Less      )
Impervious value, Ai = 0.450
Sub-Area C Value = 0.530
Initial subarea total flow distance  =   55.000(Ft.)
Highest elevation =  107.900(Ft.)
Lowest elevation =  105.800(Ft.)
Elevation difference =    2.100(Ft.) Slope =  3.818 %
Top of Initial Area Slope adjusted by User to  3.800 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 90.00 (Ft)
for the top area slope value of   3.80 %, in a development type of
 10.9 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration =   6.24 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.5300)*(  90.000^.5)/(   3.800^(1/3)]=   6.24
Rainfall intensity (I) =      2.673(In/Hr) for a     2.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.530
Subarea runoff =      0.014(CFS)
Total initial stream area =        0.010(Ac.)

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      320.000 to Point/Station      330.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
[MEDIUM DENSITY RESIDENTIAL                  ]
(10.9 DU/A or Less      )
Impervious value, Ai = 0.450
Sub-Area C Value = 0.530
Initial subarea total flow distance  =   67.000(Ft.)
Highest elevation =  109.600(Ft.)
Lowest elevation =  105.800(Ft.)
Elevation difference =    3.800(Ft.) Slope =  5.672 %
Top of Initial Area Slope adjusted by User to  5.700 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of   5.70 %, in a development type of
 10.9 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration =   5.74 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
```

```
TC = [1.8*(1.1-0.5300)*( 100.000^.5)/(   5.700^(1/3)]=   5.74
Rainfall intensity (I) =      2.819(In/Hr) for a     2.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.530
Subarea runoff =      0.015(CFS)
Total initial stream area =        0.010(Ac.)

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      340.000 to Point/Station      350.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
[MEDIUM DENSITY RESIDENTIAL                  ]
(10.9 DU/A or Less      )
Impervious value, Ai = 0.450
Sub-Area C Value = 0.530
Initial subarea total flow distance  =  244.000(Ft.)
Highest elevation =  108.200(Ft.)
Lowest elevation =  104.300(Ft.)
Elevation difference =    3.900(Ft.) Slope =  1.598 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 80.00 (Ft)
for the top area slope value of   1.60 %, in a development type of
 10.9 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration =   7.85 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.5300)*(  80.000^.5)/(   1.600^(1/3)]=   7.85
The initial area total distance of  244.00 (Ft.) entered leaves a
remaining distance of  164.00 (Ft.)
Using Figure 3-4, the travel time for this distance is   1.95 minutes
for a distance of 164.00 (Ft.) and a slope of  1.60 %
with an elevation difference of   2.62(Ft.) from the end of the top area
Tt = [11.9*length(Mi)^3)/(elevation change(Ft.))]^.385 *60(min/hr)
 =    1.947 Minutes
Tt=[(11.9*0.0311^3)/(  2.62)]^.385=  1.95
Total initial area Ti =   7.85 minutes from Figure 3-3 formula plus
  1.95 minutes from the Figure 3-4 formula =   9.79 minutes
Rainfall intensity (I) =      1.998(In/Hr) for a     2.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.530
Subarea runoff =      0.032(CFS)
Total initial stream area =        0.030(Ac.)

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Process from Point/Station      400.000 to Point/Station      410.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
[MEDIUM DENSITY RESIDENTIAL                  ]
```

```
(10.9 DU/A or Less      )
Impervious value, Ai = 0.450
Sub-Area C Value = 0.530
Initial subarea total flow distance  =  291.000(Ft.)
Highest elevation =  123.000(Ft.)
Lowest elevation =  117.600(Ft.)
Elevation difference =    5.400(Ft.) Slope =  1.856 %
Top of Initial Area Slope adjusted by User to  1.900 %
Bottom of Initial Area Slope adjusted by User to  1.900 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 80.00 (Ft)
for the top area slope value of   1.90 %, in a development type of
 10.9 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration =   7.41 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.5300)*(  80.000^.5)/(   1.900^(1/3)]=   7.41
The initial area total distance of  291.00 (Ft.) entered leaves a
remaining distance of  211.00 (Ft.)
Using Figure 3-4, the travel time for this distance is   2.21 minutes
for a distance of 211.00 (Ft.) and a slope of  1.90 %
with an elevation difference of   4.01(Ft.) from the end of the top area
Tt = [11.9*length(Mi)^3)/(elevation change(Ft.))]^.385 *60(min/hr)
 =    2.213 Minutes
Tt=[(11.9*0.0400^3)/(  4.01)]^.385=  2.21
Total initial area Ti =   7.41 minutes from Figure 3-3 formula plus
  2.21 minutes from the Figure 3-4 formula =   9.62 minutes
Rainfall intensity (I) =      2.021(In/Hr) for a     2.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.530
Subarea runoff =      0.150(CFS)
Total initial stream area =        0.140(Ac.)

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      410.000 to Point/Station      420.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
________________________________________________________________________
Upstream point/station elevation =   115.600(Ft.)
Downstream point/station elevation =   107.300(Ft.)
Pipe length  =    96.00(Ft.) Slope =   0.0865  Manning's N = 0.013
No. of pipes = 3  Required pipe flow  =     0.150(CFS)
Given pipe size =      6.00(In.)
Calculated individual pipe flow  =     0.050(CFS)
Normal flow depth in pipe =    0.72(In.)
Flow top width inside pipe =    3.90(In.)
Critical Depth =    1.31(In.)
Pipe flow velocity =      3.78(Ft/s)
Travel time through pipe =    0.42 min.
Time of concentration (TC) =    10.05 min.
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Process from Point/Station      500.000 to Point/Station      510.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
[MEDIUM DENSITY RESIDENTIAL                  ]
(10.9 DU/A or Less      )
Impervious value, Ai = 0.450
Sub-Area C Value = 0.530
Initial subarea total flow distance  =  551.000(Ft.)
Highest elevation =  115.000(Ft.)
Lowest elevation =  107.900(Ft.)
Elevation difference =    7.100(Ft.) Slope =  1.289 %
Top of Initial Area Slope adjusted by User to  1.300 %
Bottom of Initial Area Slope adjusted by User to  1.300 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 65.00 (Ft)
for the top area slope value of   1.30 %, in a development type of
 10.9 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration =   7.58 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.5300)*(  65.000^.5)/(   1.300^(1/3)]=   7.58
The initial area total distance of  551.00 (Ft.) entered leaves a
remaining distance of  486.00 (Ft.)
Using Figure 3-4, the travel time for this distance is   4.87 minutes
for a distance of 486.00 (Ft.) and a slope of  1.30 %
with an elevation difference of   6.32(Ft.) from the end of the top area
Tt = [11.9*length(Mi)^3)/(elevation change(Ft.))]^.385 *60(min/hr)
 =    4.869 Minutes
Tt=[(11.9*0.0920^3)/(  6.32)]^.385=  4.87
Total initial area Ti =   7.58 minutes from Figure 3-3 formula plus
  4.87 minutes from the Figure 3-4 formula =  12.45 minutes
Rainfall intensity (I) =      1.712(In/Hr) for a     2.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.530
Subarea runoff =      0.390(CFS)
Total initial stream area =        0.430(Ac.)
End of computations, total study area =           1.150 (Ac.)
```

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 07/01/20

117.1574 IDA AVE APARTMENTS
Proposed Conditions
10-Year Storm

********* Hydrology Study Control Information **********

Program License Serial Number 6313

Rational hydrology study storm event year is 10.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 1.600
24 hour precipitation(inches) = 3.000
P6/P24 = 53.3%
San Diego hydrology manual 'C' values used

++
Process from Point/Station 100.000 to Point/Station 110.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
[MEDIUM DENSITY RESIDENTIAL]
(10.9 DU/A or Less)
Impervious value, Ai = 0.450
Sub-Area C Value = 0.530
Initial subarea total flow distance = 284.000(Ft.)
Highest elevation = 123.000(Ft.)
Lowest elevation = 99.000(Ft.)
Elevation difference = 24.000(Ft.) Slope = 8.451 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of 8.45 %, in a development type of
10.9 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration = 5.04 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.5300)*(100.000^.5)/(8.451^(1/3)]= 5.04
The initial area total distance of 284.00 (Ft.) entered leaves a
remaining distance of 184.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 1.12 minutes
for a distance of 184.00 (Ft.) and a slope of 8.45 %
with an elevation difference of 15.55(Ft.) from the end of the top area

```
Tt = [11.9*length(Mi)^3)/(elevation change(Ft.))]^.385 *60(min/hr)
 =    1.121 Minutes
Tt=[(11.9*0.0348^3)/( 15.55)]^.385=  1.12
Total initial area Ti =   5.04 minutes from Figure 3-3 formula plus
  1.12 minutes from the Figure 3-4 formula =   6.16 minutes
Rainfall intensity (I) =      3.686(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.530
Subarea runoff =      0.176(CFS)
Total initial stream area =        0.090(Ac.)

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      200.000 to Point/Station      210.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
[MEDIUM DENSITY RESIDENTIAL                  ]
(10.9 DU/A or Less      )
Impervious value, Ai = 0.450
Sub-Area C Value = 0.530
Initial subarea total flow distance  =  367.000(Ft.)
Highest elevation =  115.250(Ft.)
Lowest elevation =   97.500(Ft.)
Elevation difference =   17.750(Ft.) Slope =  4.837 %
Top of Initial Area Slope adjusted by User to  4.800 %
Bottom of Initial Area Slope adjusted by User to  4.800 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of   4.80 %, in a development type of
 10.9 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration =   6.08 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.5300)*( 100.000^.5)/(   4.800^(1/3)]=   6.08
The initial area total distance of  367.00 (Ft.) entered leaves a
remaining distance of  267.00 (Ft.)
Using Figure 3-4, the travel time for this distance is   1.86 minutes
for a distance of 267.00 (Ft.) and a slope of  4.80 %
with an elevation difference of  12.82(Ft.) from the end of the top area
Tt = [11.9*length(Mi)^3)/(elevation change(Ft.))]^.385 *60(min/hr)
 =    1.857 Minutes
Tt=[(11.9*0.0506^3)/( 12.82)]^.385=  1.86
Total initial area Ti =   6.08 minutes from Figure 3-3 formula plus
  1.86 minutes from the Figure 3-4 formula =   7.94 minutes
Rainfall intensity (I) =      3.129(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.530
Subarea runoff =      0.730(CFS)
Total initial stream area =        0.440(Ac.)
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Process from Point/Station      300.000 to Point/Station      310.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
[MEDIUM DENSITY RESIDENTIAL                  ]
(10.9 DU/A or Less      )
Impervious value, Ai = 0.450
Sub-Area C Value = 0.530
Initial subarea total flow distance  =   55.000(Ft.)
Highest elevation =  107.900(Ft.)
Lowest elevation =  105.800(Ft.)
Elevation difference =    2.100(Ft.) Slope =  3.818 %
Top of Initial Area Slope adjusted by User to  3.800 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 90.00 (Ft)
for the top area slope value of   3.80 %, in a development type of
 10.9 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration =   6.24 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.5300)*(  90.000^.5)/(   3.800^(1/3)]=   6.24
Rainfall intensity (I) =      3.655(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.530
Subarea runoff =      0.019(CFS)
Total initial stream area =        0.010(Ac.)

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      320.000 to Point/Station      330.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
[MEDIUM DENSITY RESIDENTIAL                  ]
(10.9 DU/A or Less      )
Impervious value, Ai = 0.450
Sub-Area C Value = 0.530
Initial subarea total flow distance  =   67.000(Ft.)
Highest elevation =  109.600(Ft.)
Lowest elevation =  105.800(Ft.)
Elevation difference =    3.800(Ft.) Slope =  5.672 %
Top of Initial Area Slope adjusted by User to  5.700 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of   5.70 %, in a development type of
 10.9 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration =   5.74 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
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TC = [1.8*(1.1-0.5300)*( 100.000^.5)/(   5.700^(1/3)]=   5.74
Rainfall intensity (I) =      3.855(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.530
Subarea runoff =      0.020(CFS)
Total initial stream area =        0.010(Ac.)

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      340.000 to Point/Station      350.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
[MEDIUM DENSITY RESIDENTIAL                  ]
(10.9 DU/A or Less      )
Impervious value, Ai = 0.450
Sub-Area C Value = 0.530
Initial subarea total flow distance  =  244.000(Ft.)
Highest elevation =  108.200(Ft.)
Lowest elevation =  104.300(Ft.)
Elevation difference =    3.900(Ft.) Slope =  1.598 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 80.00 (Ft)
for the top area slope value of   1.60 %, in a development type of
 10.9 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration =   7.85 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.5300)*(  80.000^.5)/(   1.600^(1/3)]=   7.85
The initial area total distance of  244.00 (Ft.) entered leaves a
remaining distance of  164.00 (Ft.)
Using Figure 3-4, the travel time for this distance is   1.95 minutes
for a distance of 164.00 (Ft.) and a slope of  1.60 %
with an elevation difference of   2.62(Ft.) from the end of the top area
Tt = [11.9*length(Mi)^3)/(elevation change(Ft.))]^.385 *60(min/hr)
 =    1.947 Minutes
Tt=[(11.9*0.0311^3)/(  2.62)]^.385=  1.95
Total initial area Ti =   7.85 minutes from Figure 3-3 formula plus
  1.95 minutes from the Figure 3-4 formula =   9.79 minutes
Rainfall intensity (I) =      2.732(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.530
Subarea runoff =      0.043(CFS)
Total initial stream area =        0.030(Ac.)

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Process from Point/Station      400.000 to Point/Station      410.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
[MEDIUM DENSITY RESIDENTIAL                  ]
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(10.9 DU/A or Less      )
Impervious value, Ai = 0.450
Sub-Area C Value = 0.530
Initial subarea total flow distance  =  291.000(Ft.)
Highest elevation =  123.000(Ft.)
Lowest elevation =  117.600(Ft.)
Elevation difference =    5.400(Ft.) Slope =  1.856 %
Top of Initial Area Slope adjusted by User to  1.900 %
Bottom of Initial Area Slope adjusted by User to  1.900 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 80.00 (Ft)
for the top area slope value of   1.90 %, in a development type of
 10.9 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration =   7.41 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.5300)*(  80.000^.5)/(   1.900^(1/3)]=   7.41
The initial area total distance of  291.00 (Ft.) entered leaves a
remaining distance of  211.00 (Ft.)
Using Figure 3-4, the travel time for this distance is   2.21 minutes
for a distance of 211.00 (Ft.) and a slope of  1.90 %
with an elevation difference of   4.01(Ft.) from the end of the top area
Tt = [11.9*length(Mi)^3)/(elevation change(Ft.))]^.385 *60(min/hr)
 =    2.213 Minutes
Tt=[(11.9*0.0400^3)/(  4.01)]^.385=  2.21
Total initial area Ti =   7.41 minutes from Figure 3-3 formula plus
  2.21 minutes from the Figure 3-4 formula =   9.62 minutes
Rainfall intensity (I) =      2.764(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.530
Subarea runoff =      0.205(CFS)
Total initial stream area =        0.140(Ac.)

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      410.000 to Point/Station      420.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
________________________________________________________________________
Upstream point/station elevation =   115.600(Ft.)
Downstream point/station elevation =   107.300(Ft.)
Pipe length  =    96.00(Ft.) Slope =   0.0865  Manning's N = 0.013
No. of pipes = 3  Required pipe flow  =     0.205(CFS)
Given pipe size =      6.00(In.)
Calculated individual pipe flow  =     0.068(CFS)
Normal flow depth in pipe =    0.84(In.)
Flow top width inside pipe =    4.16(In.)
Critical Depth =    1.54(In.)
Pipe flow velocity =      4.15(Ft/s)
Travel time through pipe =    0.39 min.
Time of concentration (TC) =    10.01 min.
```

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      500.000 to Point/Station      510.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
[MEDIUM DENSITY RESIDENTIAL                  ]
(10.9 DU/A or Less      )
Impervious value, Ai = 0.450
Sub-Area C Value = 0.530
Initial subarea total flow distance  =  551.000(Ft.)
Highest elevation =  115.000(Ft.)
Lowest elevation =  107.900(Ft.)
Elevation difference =    7.100(Ft.) Slope =  1.289 %
Top of Initial Area Slope adjusted by User to  1.300 %
Bottom of Initial Area Slope adjusted by User to  1.300 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 65.00 (Ft)
for the top area slope value of   1.30 %, in a development type of
 10.9 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration =   7.58 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.5300)*(  65.000^.5)/(   1.300^(1/3)]=   7.58
The initial area total distance of  551.00 (Ft.) entered leaves a
remaining distance of  486.00 (Ft.)
Using Figure 3-4, the travel time for this distance is   4.87 minutes
for a distance of 486.00 (Ft.) and a slope of  1.30 %
with an elevation difference of   6.32(Ft.) from the end of the top area
Tt = [11.9*length(Mi)^3)/(elevation change(Ft.))]^.385 *60(min/hr)
 =    4.869 Minutes
Tt=[(11.9*0.0920^3)/(  6.32)]^.385=  4.87
Total initial area Ti =   7.58 minutes from Figure 3-3 formula plus
  4.87 minutes from the Figure 3-4 formula =  12.45 minutes
Rainfall intensity (I) =      2.341(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.530
Subarea runoff =      0.533(CFS)
Total initial stream area =        0.430(Ac.)
End of computations, total study area =           1.150 (Ac.)
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San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
Rational Hydrology Study Date: 07/01/20

117.1574 IDA AVE APARTMENTS
Proposed Conditions
100-Year Storm

********* Hydrology Study Control Information **********

Program License Serial Number 6313

Rational hydrology study storm event year is 100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 2.500
24 hour precipitation(inches) = 4.000
P6/P24 = 62.5%
San Diego hydrology manual 'C' values used

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Process from Point/Station 100.000 to Point/Station 110.000
**** INITIAL AREA EVALUATION ****

Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
[MEDIUM DENSITY RESIDENTIAL]
(10.9 DU/A or Less)
Impervious value, Ai = 0.450
Sub-Area C Value = 0.530
Initial subarea total flow distance = 284.000(Ft.)
Highest elevation = 123.000(Ft.)
Lowest elevation = 99.000(Ft.)
Elevation difference = 24.000(Ft.) Slope = 8.451 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of 8.45 %, in a development type of
10.9 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration = 5.04 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.5300)*(100.000^.5)/(8.451^(1/3)]= 5.04
The initial area total distance of 284.00 (Ft.) entered leaves a
remaining distance of 184.00 (Ft.)
Using Figure 3-4, the travel time for this distance is 1.12 minutes
for a distance of 184.00 (Ft.) and a slope of 8.45 %

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with an elevation difference of  15.55(Ft.) from the end of the top area
Tt = [11.9*length(Mi)^3)/(elevation change(Ft.))]^.385 *60(min/hr)
 =    1.121 Minutes
Tt=[(11.9*0.0348^3)/( 15.55)]^.385=  1.12
Total initial area Ti =   5.04 minutes from Figure 3-3 formula plus
  1.12 minutes from the Figure 3-4 formula =   6.16 minutes
Rainfall intensity (I) =      5.759(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.530
Subarea runoff =      0.275(CFS)
Total initial stream area =        0.090(Ac.)

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Process from Point/Station      200.000 to Point/Station      210.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
[MEDIUM DENSITY RESIDENTIAL                  ]
(10.9 DU/A or Less      )
Impervious value, Ai = 0.450
Sub-Area C Value = 0.530
Initial subarea total flow distance  =  367.000(Ft.)
Highest elevation =  115.250(Ft.)
Lowest elevation =   97.500(Ft.)
Elevation difference =   17.750(Ft.) Slope =  4.837 %
Top of Initial Area Slope adjusted by User to  4.800 %
Bottom of Initial Area Slope adjusted by User to  4.800 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of   4.80 %, in a development type of
 10.9 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration =   6.08 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.5300)*( 100.000^.5)/(   4.800^(1/3)]=   6.08
The initial area total distance of  367.00 (Ft.) entered leaves a
remaining distance of  267.00 (Ft.)
Using Figure 3-4, the travel time for this distance is   1.86 minutes
for a distance of 267.00 (Ft.) and a slope of  4.80 %
with an elevation difference of  12.82(Ft.) from the end of the top area
Tt = [11.9*length(Mi)^3)/(elevation change(Ft.))]^.385 *60(min/hr)
 =    1.857 Minutes
Tt=[(11.9*0.0506^3)/( 12.82)]^.385=  1.86
Total initial area Ti =   6.08 minutes from Figure 3-3 formula plus
  1.86 minutes from the Figure 3-4 formula =   7.94 minutes
Rainfall intensity (I) =      4.888(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.530
Subarea runoff =      1.140(CFS)
Total initial stream area =        0.440(Ac.)
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Process from Point/Station      300.000 to Point/Station      310.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
[MEDIUM DENSITY RESIDENTIAL                  ]
(10.9 DU/A or Less      )
Impervious value, Ai = 0.450
Sub-Area C Value = 0.530
Initial subarea total flow distance  =   55.000(Ft.)
Highest elevation =  107.900(Ft.)
Lowest elevation =  105.800(Ft.)
Elevation difference =    2.100(Ft.) Slope =  3.818 %
Top of Initial Area Slope adjusted by User to  3.800 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 90.00 (Ft)
for the top area slope value of   3.80 %, in a development type of
 10.9 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration =   6.24 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.5300)*(  90.000^.5)/(   3.800^(1/3)]=   6.24
Rainfall intensity (I) =      5.711(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.530
Subarea runoff =      0.030(CFS)
Total initial stream area =        0.010(Ac.)

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Process from Point/Station      320.000 to Point/Station      330.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
[MEDIUM DENSITY RESIDENTIAL                  ]
(10.9 DU/A or Less      )
Impervious value, Ai = 0.450
Sub-Area C Value = 0.530
Initial subarea total flow distance  =   67.000(Ft.)
Highest elevation =  109.600(Ft.)
Lowest elevation =  105.800(Ft.)
Elevation difference =    3.800(Ft.) Slope =  5.672 %
Top of Initial Area Slope adjusted by User to  5.700 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of   5.70 %, in a development type of
 10.9 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration =   5.74 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
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TC = [1.8*(1.1-0.5300)*( 100.000^.5)/(   5.700^(1/3)]=   5.74
Rainfall intensity (I) =      6.023(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.530
Subarea runoff =      0.032(CFS)
Total initial stream area =        0.010(Ac.)

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Process from Point/Station      340.000 to Point/Station      350.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
[MEDIUM DENSITY RESIDENTIAL                  ]
(10.9 DU/A or Less      )
Impervious value, Ai = 0.450
Sub-Area C Value = 0.530
Initial subarea total flow distance  =  244.000(Ft.)
Highest elevation =  108.200(Ft.)
Lowest elevation =  104.300(Ft.)
Elevation difference =    3.900(Ft.) Slope =  1.598 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 80.00 (Ft)
for the top area slope value of   1.60 %, in a development type of
 10.9 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration =   7.85 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.5300)*(  80.000^.5)/(   1.600^(1/3)]=   7.85
The initial area total distance of  244.00 (Ft.) entered leaves a
remaining distance of  164.00 (Ft.)
Using Figure 3-4, the travel time for this distance is   1.95 minutes
for a distance of 164.00 (Ft.) and a slope of  1.60 %
with an elevation difference of   2.62(Ft.) from the end of the top area
Tt = [11.9*length(Mi)^3)/(elevation change(Ft.))]^.385 *60(min/hr)
 =    1.947 Minutes
Tt=[(11.9*0.0311^3)/(  2.62)]^.385=  1.95
Total initial area Ti =   7.85 minutes from Figure 3-3 formula plus
  1.95 minutes from the Figure 3-4 formula =   9.79 minutes
Rainfall intensity (I) =      4.269(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.530
Subarea runoff =      0.068(CFS)
Total initial stream area =        0.030(Ac.)

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Process from Point/Station      400.000 to Point/Station      410.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
[MEDIUM DENSITY RESIDENTIAL                  ]
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(10.9 DU/A or Less      )
Impervious value, Ai = 0.450
Sub-Area C Value = 0.530
Initial subarea total flow distance  =  291.000(Ft.)
Highest elevation =  123.000(Ft.)
Lowest elevation =  117.600(Ft.)
Elevation difference =    5.400(Ft.) Slope =  1.856 %
Top of Initial Area Slope adjusted by User to  1.900 %
Bottom of Initial Area Slope adjusted by User to  1.900 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 80.00 (Ft)
for the top area slope value of   1.90 %, in a development type of
 10.9 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration =   7.41 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.5300)*(  80.000^.5)/(   1.900^(1/3)]=   7.41
The initial area total distance of  291.00 (Ft.) entered leaves a
remaining distance of  211.00 (Ft.)
Using Figure 3-4, the travel time for this distance is   2.21 minutes
for a distance of 211.00 (Ft.) and a slope of  1.90 %
with an elevation difference of   4.01(Ft.) from the end of the top area
Tt = [11.9*length(Mi)^3)/(elevation change(Ft.))]^.385 *60(min/hr)
 =    2.213 Minutes
Tt=[(11.9*0.0400^3)/(  4.01)]^.385=  2.21
Total initial area Ti =   7.41 minutes from Figure 3-3 formula plus
  2.21 minutes from the Figure 3-4 formula =   9.62 minutes
Rainfall intensity (I) =      4.318(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.530
Subarea runoff =      0.320(CFS)
Total initial stream area =        0.140(Ac.)


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Process from Point/Station      410.000 to Point/Station      420.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
________________________________________________________________________
Upstream point/station elevation =   115.600(Ft.)
Downstream point/station elevation =   107.300(Ft.)
Pipe length  =    96.00(Ft.) Slope =   0.0865  Manning's N = 0.013
No. of pipes = 3  Required pipe flow  =     0.320(CFS)
Given pipe size =      6.00(In.)
Calculated individual pipe flow  =     0.107(CFS)
Normal flow depth in pipe =    1.04(In.)
Flow top width inside pipe =    4.54(In.)
Critical Depth =    1.94(In.)
Pipe flow velocity =      4.73(Ft/s)
Travel time through pipe =    0.34 min.
Time of concentration (TC) =     9.96 min.
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Process from Point/Station      500.000 to Point/Station      510.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
[MEDIUM DENSITY RESIDENTIAL                  ]
(10.9 DU/A or Less      )
Impervious value, Ai = 0.450
Sub-Area C Value = 0.530
Initial subarea total flow distance  =  551.000(Ft.)
Highest elevation =  115.000(Ft.)
Lowest elevation =  107.900(Ft.)
Elevation difference =    7.100(Ft.) Slope =  1.289 %
Top of Initial Area Slope adjusted by User to  1.300 %
Bottom of Initial Area Slope adjusted by User to  1.300 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 65.00 (Ft)
for the top area slope value of   1.30 %, in a development type of
 10.9 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration =   7.58 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.5300)*(  65.000^.5)/(   1.300^(1/3)]=   7.58
The initial area total distance of  551.00 (Ft.) entered leaves a
remaining distance of  486.00 (Ft.)
Using Figure 3-4, the travel time for this distance is   4.87 minutes
for a distance of 486.00 (Ft.) and a slope of  1.30 %
with an elevation difference of   6.32(Ft.) from the end of the top area
Tt = [11.9*length(Mi)^3)/(elevation change(Ft.))]^.385 *60(min/hr)
 =    4.869 Minutes
Tt=[(11.9*0.0920^3)/(  6.32)]^.385=  4.87
Total initial area Ti =   7.58 minutes from Figure 3-3 formula plus
  4.87 minutes from the Figure 3-4 formula =  12.45 minutes
Rainfall intensity (I) =      3.657(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.530
Subarea runoff =      0.834(CFS)
Total initial stream area =        0.430(Ac.)
End of computations, total study area =           1.150 (Ac.)
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U N I T H Y D R O G R A P H A N A L Y S I S

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Study date 05/17/18 File: 1574UHPROPSITE.out

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Program License Serial Number 6313

10-YEAR UNIT HYDROGRAPH
117.1574 - IDA AVE APARTMENTS
PROPOSED SITE
ARMSTRONG & BROOKS

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Storm Event Year = 10

Antecedent Moisture Condition = 1

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

Area averaged rainfall isohyetal data:

Sub-Area(Ac.)	Rainfall (In)
1.17	3.00

Rainfall Distribution pattern used in study:
Type B for San Diego area of California

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********* Area-Averaged SCS Curve Number and Fm *********

Area (Ac.)	Area fract	SCS CN (AMC2)	SCS CN (AMC1)	Fm (In/Hr)	Soil Group
0.59	0.500	77.0	59.4	0.100	A
0.58	0.500	98.0	98.0		

Area-averaged catchment SCS Curve Number AMC(1) = 78.700
Area-averaged Fm value using values listed = 0.050(In/Hr)

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User entry of time of concentration = 0.138 (hours)
Watershed area = 1.17(Ac.)
Catchment Lag time = 0.083 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 100.6441
Hydrograph baseflow = 0.00(CFS)
Minimum watershed loss rate(Fm) = 0.050(In/Hr)
Average adjusted SCS Curve Number = 78.700

Rainfall depth area reduction factors:
Using a total area of 1.17(Ac.) (Ref: SCS Sup A, Sec.4)

Pacific Coastal Climate ratio used
Areal factor ratio (rainfall reduction) = 1.000
Rainfall entered for study = 3.000(In)
Adjusted rainfall = 3.000(In)

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The following unit hydrograph was developed using an S-Graph interpolated by time percentage of lag time vs. percentage of peak flow. The S-Graphs for Valley, Foothill, and Mountain were developed by the U.S. Army Corps of Engineers for use in the respective type of basins located in Southern California. (Hydrology San Gabrial River ... U.S. Engineer Office, Dec 1944, revised Jul 1946) The Desert S-Graph is from Report ... on ... Tahquitz Creek, California, same U.S. offfice, Corps of Engineers, June 1963. The Valley Developed S-Graph is used by Orange and San Bernardino counties in California to represent the characteristics of valley areas with a large amount of development. Because of the wide variety in topography in Southern California, these synthetic unit hydrographs were included for use as options in any geographic location.

The SCS(Soil Conservation Service Dimensionless S-Graph, SCS handbook, of 1972, applies to a broad cross section of geographic locations and hydrologic regions.

The User Defined hydrograph converts the user Q/Qp vs. T/Tp values into an S-Graph based on lag = Tp/0.9. Then, for the lag time used, the S-Graph in interpolated in time % of lag.

The following S-Graph or S-Graph combination is used in this study:

FOOTHILL S-Graph

U N I T H Y D R O G R A P H

Time Ratio (t/Lag)	Time (hrs)	Discharge Ratios (Q/Qp)	Q (CFS)	Mass Curve Ratios (Qa/Q)
		(K = 12.10 (CFS))		
1.01	0.083	0.263	1.772	0.146
2.01	0.167	1.000	6.749	0.704
3.02	0.250	0.328	2.217	0.887
4.03	0.333	0.132	0.891	0.961
5.03	0.417	0.043	0.290	0.985
6.04	0.500	0.015	0.102	0.993
7.05	0.583	0.012	0.079	1.000

For each time interval of the 6 or 24 hour storm, the total rainfall up to that storm time is calculated. Then the Soil Conservation Service SCS (report 1972, 1975) area averaged Curve Number (CN) is used to determine the amount of direct runoff in (In) using the following equations:

$$Q = \frac{(P - Ia)^2}{P - Ia + S}$$

Where:
Q = direct runoff, P = depth of precipitation, Ia = Initial Abstraction and S is the watershed storage in inches. S and Ia are given by the following equations:

$$S = \frac{1000}{CN} - 10 \quad \text{and} \quad Ia = 0.2\ S$$

Note: If Metric (SI) Units are used, rainfall data is converted by the program internally into inches for these calculations.

Note: In the following printout, the revised runoff column is only used when the minimum soil loss rate, fm, exceeds the normal loss rate of delta P(dP) - delta Q(dQ) then the dP-dQ column equals fm = 0.050(In) (for time interval = 0.004(In)) and the revised runoff is shown in the last column.

Time Period (hours)	Total Rainfall (In) P	Total SCS Runoff (In) Q	Rainfall Amount (In) dP	Runoff Amount (In) dQ	Infiltr-ation (In) dP-dQ	Revised Runoff Min Loss Rate
0.08	0.0045	0.0000	0.0045	0.0000	0.0045	--------
0.17	0.0090	0.0000	0.0045	0.0000	0.0045	--------
0.25	0.0135	0.0000	0.0045	0.0000	0.0045	--------
0.33	0.0180	0.0000	0.0045	0.0000	0.0045	--------
0.42	0.0225	0.0000	0.0045	0.0000	0.0045	--------
0.50	0.0270	0.0000	0.0045	0.0000	0.0045	--------
0.58	0.0305	0.0000	0.0035	--------	0.0042	0.0000
0.67	0.0340	0.0000	0.0035	--------	0.0042	0.0000

0.75	0.0375	0.0000	0.0035	--------	0.0042	0.0000
0.83	0.0410	0.0000	0.0035	--------	0.0042	0.0000
0.92	0.0445	0.0000	0.0035	--------	0.0042	0.0000
1.00	0.0480	0.0000	0.0035	--------	0.0042	0.0000
1.08	0.0525	0.0000	0.0045	0.0000	0.0045	--------
1.17	0.0570	0.0000	0.0045	0.0000	0.0045	--------
1.25	0.0615	0.0000	0.0045	0.0000	0.0045	--------
1.33	0.0660	0.0000	0.0045	0.0000	0.0045	--------
1.42	0.0705	0.0000	0.0045	0.0000	0.0045	--------
1.50	0.0750	0.0000	0.0045	0.0000	0.0045	--------
1.58	0.0795	0.0000	0.0045	0.0000	0.0045	--------
1.67	0.0840	0.0000	0.0045	0.0000	0.0045	--------
1.75	0.0885	0.0000	0.0045	0.0000	0.0045	--------
1.83	0.0930	0.0000	0.0045	0.0000	0.0045	--------
1.92	0.0975	0.0000	0.0045	0.0000	0.0045	--------
2.00	0.1020	0.0000	0.0045	0.0000	0.0045	--------
2.08	0.1075	0.0000	0.0055	0.0000	0.0055	--------
2.17	0.1130	0.0000	0.0055	0.0000	0.0055	--------
2.25	0.1185	0.0000	0.0055	0.0000	0.0055	--------
2.33	0.1240	0.0000	0.0055	0.0000	0.0055	--------
2.42	0.1295	0.0000	0.0055	0.0000	0.0055	--------
2.50	0.1350	0.0000	0.0055	0.0000	0.0055	--------
2.58	0.1395	0.0000	0.0045	0.0000	0.0045	--------
2.67	0.1440	0.0000	0.0045	0.0000	0.0045	--------
2.75	0.1485	0.0000	0.0045	0.0000	0.0045	--------
2.83	0.1530	0.0000	0.0045	0.0000	0.0045	--------
2.92	0.1575	0.0000	0.0045	0.0000	0.0045	--------
3.00	0.1620	0.0000	0.0045	0.0000	0.0045	--------
3.08	0.1675	0.0000	0.0055	0.0000	0.0055	--------
3.17	0.1730	0.0000	0.0055	0.0000	0.0055	--------
3.25	0.1785	0.0000	0.0055	0.0000	0.0055	--------
3.33	0.1840	0.0000	0.0055	0.0000	0.0055	--------
3.42	0.1895	0.0000	0.0055	0.0000	0.0055	--------
3.50	0.1950	0.0000	0.0055	0.0000	0.0055	--------
3.58	0.2010	0.0000	0.0060	0.0000	0.0060	--------
3.67	0.2070	0.0000	0.0060	0.0000	0.0060	--------
3.75	0.2130	0.0000	0.0060	0.0000	0.0060	--------
3.83	0.2190	0.0000	0.0060	0.0000	0.0060	--------
3.92	0.2250	0.0000	0.0060	0.0000	0.0060	--------
4.00	0.2310	0.0000	0.0060	0.0000	0.0060	--------
4.08	0.2375	0.0000	0.0065	0.0000	0.0065	--------
4.17	0.2440	0.0000	0.0065	0.0000	0.0065	--------
4.25	0.2505	0.0000	0.0065	0.0000	0.0065	--------
4.33	0.2570	0.0000	0.0065	0.0000	0.0065	--------
4.42	0.2635	0.0000	0.0065	0.0000	0.0065	--------
4.50	0.2700	0.0000	0.0065	0.0000	0.0065	--------
4.58	0.2770	0.0000	0.0070	0.0000	0.0070	--------
4.67	0.2840	0.0000	0.0070	0.0000	0.0070	--------
4.75	0.2910	0.0000	0.0070	0.0000	0.0070	--------
4.83	0.2980	0.0000	0.0070	0.0000	0.0070	--------
4.92	0.3050	0.0000	0.0070	0.0000	0.0070	--------
5.00	0.3120	0.0000	0.0070	0.0000	0.0070	--------
5.08	0.3200	0.0000	0.0080	0.0000	0.0080	--------
5.17	0.3280	0.0000	0.0080	0.0000	0.0080	--------
5.25	0.3360	0.0000	0.0080	0.0000	0.0080	--------
5.33	0.3440	0.0000	0.0080	0.0000	0.0080	--------
5.42	0.3520	0.0000	0.0080	0.0000	0.0080	--------
5.50	0.3600	0.0000	0.0080	0.0000	0.0080	--------
5.58	0.3685	0.0000	0.0085	0.0000	0.0085	--------
5.67	0.3770	0.0000	0.0085	0.0000	0.0085	--------
5.75	0.3855	0.0000	0.0085	0.0000	0.0085	--------
5.83	0.3940	0.0000	0.0085	0.0000	0.0085	--------
5.92	0.4025	0.0000	0.0085	0.0000	0.0085	--------
6.00	0.4110	0.0000	0.0085	0.0000	0.0085	--------
6.08	0.4210	0.0000	0.0100	0.0000	0.0100	--------
6.17	0.4310	0.0000	0.0100	0.0000	0.0100	--------
6.25	0.4410	0.0000	0.0100	0.0000	0.0100	--------
6.33	0.4510	0.0000	0.0100	0.0000	0.0100	--------
6.42	0.4610	0.0000	0.0100	0.0000	0.0100	--------
6.50	0.4710	0.0000	0.0100	0.0000	0.0100	--------
6.58	0.4825	0.0000	0.0115	0.0000	0.0115	--------
6.67	0.4940	0.0000	0.0115	0.0000	0.0115	--------
6.75	0.5055	0.0000	0.0115	0.0000	0.0115	--------
6.83	0.5170	0.0000	0.0115	0.0000	0.0115	--------
6.92	0.5285	0.0000	0.0115	0.0000	0.0115	--------
7.00	0.5400	0.0000	0.0115	0.0000	0.0115	--------
7.08	0.5550	0.0001	0.0150	0.0001	0.0149	--------
7.17	0.5700	0.0003	0.0150	0.0002	0.0148	--------
7.25	0.5850	0.0007	0.0150	0.0004	0.0146	--------

7.33	0.6000	0.0012	0.0150	0.0006	0.0144	--------
7.42	0.6150	0.0020	0.0150	0.0007	0.0143	--------
7.50	0.6300	0.0028	0.0150	0.0009	0.0141	--------
7.58	0.6525	0.0044	0.0225	0.0016	0.0209	--------
7.67	0.6750	0.0063	0.0225	0.0019	0.0206	--------
7.75	0.6975	0.0085	0.0225	0.0022	0.0203	--------
7.83	0.7200	0.0111	0.0225	0.0025	0.0200	--------
7.92	0.7425	0.0139	0.0225	0.0029	0.0196	--------
8.00	0.7650	0.0171	0.0225	0.0032	0.0193	--------
8.08	0.7985	0.0223	0.0335	0.0052	0.0283	--------
8.17	0.8320	0.0282	0.0335	0.0059	0.0276	--------
8.25	0.8655	0.0347	0.0335	0.0065	0.0270	--------
8.33	0.8990	0.0418	0.0335	0.0071	0.0264	--------
8.42	0.9325	0.0494	0.0335	0.0076	0.0259	--------
8.50	0.9660	0.0576	0.0335	0.0082	0.0253	--------
8.58	1.0100	0.0692	0.0440	0.0116	0.0324	--------
8.67	1.0540	0.0817	0.0440	0.0125	0.0315	--------
8.75	1.0980	0.0950	0.0440	0.0133	0.0307	--------
8.83	1.1420	0.1091	0.0440	0.0141	0.0299	--------
8.92	1.1860	0.1240	0.0440	0.0149	0.0291	--------
9.00	1.2300	0.1397	0.0440	0.0157	0.0283	--------
9.08	1.2780	0.1576	0.0480	0.0179	0.0301	--------
9.17	1.3260	0.1764	0.0480	0.0188	0.0292	--------
9.25	1.3740	0.1959	0.0480	0.0195	0.0285	--------
9.33	1.4220	0.2162	0.0480	0.0203	0.0277	--------
9.42	1.4700	0.2373	0.0480	0.0210	0.0270	--------
9.50	1.5180	0.2590	0.0480	0.0217	0.0263	--------
9.58	1.5590	0.2781	0.0410	0.0191	0.0219	--------
9.67	1.6000	0.2977	0.0410	0.0196	0.0214	--------
9.75	1.6410	0.3177	0.0410	0.0200	0.0210	--------
9.83	1.6820	0.3382	0.0410	0.0205	0.0205	--------
9.92	1.7230	0.3591	0.0410	0.0209	0.0201	--------
10.00	1.7640	0.3805	0.0410	0.0213	0.0197	--------
10.08	1.7845	0.3913	0.0205	0.0108	0.0097	--------
10.17	1.8050	0.4022	0.0205	0.0109	0.0096	--------
10.25	1.8255	0.4133	0.0205	0.0110	0.0095	--------
10.33	1.8460	0.4244	0.0205	0.0111	0.0094	--------
10.42	1.8665	0.4356	0.0205	0.0112	0.0093	--------
10.50	1.8870	0.4469	0.0205	0.0113	0.0092	--------
10.58	1.9005	0.4544	0.0135	0.0075	0.0060	--------
10.67	1.9140	0.4619	0.0135	0.0075	0.0060	--------
10.75	1.9275	0.4695	0.0135	0.0076	0.0059	--------
10.83	1.9410	0.4771	0.0135	0.0076	0.0059	--------
10.92	1.9545	0.4848	0.0135	0.0077	0.0058	--------
11.00	1.9680	0.4925	0.0135	0.0077	0.0058	--------
11.08	1.9795	0.4991	0.0115	0.0066	0.0049	--------
11.17	1.9910	0.5057	0.0115	0.0066	0.0049	--------
11.25	2.0025	0.5123	0.0115	0.0066	0.0049	--------
11.33	2.0140	0.5190	0.0115	0.0067	0.0048	--------
11.42	2.0255	0.5257	0.0115	0.0067	0.0048	--------
11.50	2.0370	0.5324	0.0115	0.0067	0.0048	--------
11.58	2.0475	0.5385	0.0105	0.0062	0.0043	--------
11.67	2.0580	0.5447	0.0105	0.0062	0.0043	--------
11.75	2.0685	0.5509	0.0105	0.0062	0.0043	--------
11.83	2.0790	0.5571	0.0105	0.0062	0.0043	--------
11.92	2.0895	0.5634	0.0105	0.0062	0.0043	--------
12.00	2.1000	0.5696	0.0105	0.0063	0.0042	--------
12.08	2.1100	0.5756	0.0100	--------	0.0042	0.0058
12.17	2.1200	0.5816	0.0100	--------	0.0042	0.0058
12.25	2.1300	0.5876	0.0100	--------	0.0042	0.0058
12.33	2.1400	0.5937	0.0100	--------	0.0042	0.0058
12.42	2.1500	0.5997	0.0100	--------	0.0042	0.0058
12.50	2.1600	0.6058	0.0100	--------	0.0042	0.0058
12.58	2.1695	0.6116	0.0095	--------	0.0042	0.0053
12.67	2.1790	0.6174	0.0095	--------	0.0042	0.0053
12.75	2.1885	0.6232	0.0095	--------	0.0042	0.0053
12.83	2.1980	0.6291	0.0095	--------	0.0042	0.0053
12.92	2.2075	0.6349	0.0095	--------	0.0042	0.0053
13.00	2.2170	0.6408	0.0095	--------	0.0042	0.0053
13.08	2.2255	0.6460	0.0085	--------	0.0042	0.0043
13.17	2.2340	0.6513	0.0085	--------	0.0042	0.0043
13.25	2.2425	0.6566	0.0085	--------	0.0042	0.0043
13.33	2.2510	0.6619	0.0085	--------	0.0042	0.0043
13.42	2.2595	0.6672	0.0085	--------	0.0042	0.0043
13.50	2.2680	0.6725	0.0085	--------	0.0042	0.0043
13.58	2.2760	0.6776	0.0080	--------	0.0042	0.0038
13.67	2.2840	0.6826	0.0080	--------	0.0042	0.0038
13.75	2.2920	0.6876	0.0080	--------	0.0042	0.0038
13.83	2.3000	0.6927	0.0080	--------	0.0042	0.0038

13.92	2.3080	0.6978	0.0080	--------	0.0042	0.0038
14.00	2.3160	0.7028	0.0080	--------	0.0042	0.0038
14.08	2.3250	0.7086	0.0090	--------	0.0042	0.0048
14.17	2.3340	0.7143	0.0090	--------	0.0042	0.0048
14.25	2.3430	0.7201	0.0090	--------	0.0042	0.0048
14.33	2.3520	0.7258	0.0090	--------	0.0042	0.0048
14.42	2.3610	0.7316	0.0090	--------	0.0042	0.0048
14.50	2.3700	0.7374	0.0090	--------	0.0042	0.0048
14.58	2.3750	0.7406	0.0050	--------	0.0042	0.0008
14.67	2.3800	0.7438	0.0050	--------	0.0042	0.0008
14.75	2.3850	0.7471	0.0050	--------	0.0042	0.0008
14.83	2.3900	0.7503	0.0050	--------	0.0042	0.0008
14.92	2.3950	0.7535	0.0050	--------	0.0042	0.0008
15.00	2.4000	0.7568	0.0050	--------	0.0042	0.0008
15.08	2.4080	0.7620	0.0080	--------	0.0042	0.0038
15.17	2.4160	0.7672	0.0080	--------	0.0042	0.0038
15.25	2.4240	0.7724	0.0080	--------	0.0042	0.0038
15.33	2.4320	0.7776	0.0080	--------	0.0042	0.0038
15.42	2.4400	0.7828	0.0080	--------	0.0042	0.0038
15.50	2.4480	0.7881	0.0080	--------	0.0042	0.0038
15.58	2.4555	0.7930	0.0075	--------	0.0042	0.0033
15.67	2.4630	0.7979	0.0075	--------	0.0042	0.0033
15.75	2.4705	0.8029	0.0075	--------	0.0042	0.0033
15.83	2.4780	0.8078	0.0075	--------	0.0042	0.0033
15.92	2.4855	0.8128	0.0075	--------	0.0042	0.0033
16.00	2.4930	0.8177	0.0075	--------	0.0042	0.0033
16.08	2.5000	0.8224	0.0070	--------	0.0042	0.0028
16.17	2.5070	0.8270	0.0070	--------	0.0042	0.0028
16.25	2.5140	0.8317	0.0070	--------	0.0042	0.0028
16.33	2.5210	0.8363	0.0070	--------	0.0042	0.0028
16.42	2.5280	0.8410	0.0070	--------	0.0042	0.0028
16.50	2.5350	0.8457	0.0070	--------	0.0042	0.0028
16.58	2.5425	0.8507	0.0075	--------	0.0042	0.0033
16.67	2.5500	0.8557	0.0075	--------	0.0042	0.0033
16.75	2.5575	0.8608	0.0075	--------	0.0042	0.0033
16.83	2.5650	0.8658	0.0075	--------	0.0042	0.0033
16.92	2.5725	0.8708	0.0075	--------	0.0042	0.0033
17.00	2.5800	0.8759	0.0075	--------	0.0042	0.0033
17.08	2.5860	0.8800	0.0060	--------	0.0042	0.0018
17.17	2.5920	0.8840	0.0060	--------	0.0042	0.0018
17.25	2.5980	0.8881	0.0060	--------	0.0042	0.0018
17.33	2.6040	0.8921	0.0060	--------	0.0042	0.0018
17.42	2.6100	0.8962	0.0060	--------	0.0042	0.0018
17.50	2.6160	0.9003	0.0060	--------	0.0042	0.0018
17.58	2.6225	0.9047	0.0065	--------	0.0042	0.0023
17.67	2.6290	0.9091	0.0065	--------	0.0042	0.0023
17.75	2.6355	0.9136	0.0065	--------	0.0042	0.0023
17.83	2.6420	0.9180	0.0065	--------	0.0042	0.0023
17.92	2.6485	0.9224	0.0065	--------	0.0042	0.0023
18.00	2.6550	0.9269	0.0065	--------	0.0042	0.0023
18.08	2.6600	0.9303	0.0050	--------	0.0042	0.0008
18.17	2.6650	0.9337	0.0050	--------	0.0042	0.0008
18.25	2.6700	0.9372	0.0050	--------	0.0042	0.0008
18.33	2.6750	0.9406	0.0050	--------	0.0042	0.0008
18.42	2.6800	0.9440	0.0050	--------	0.0042	0.0008
18.50	2.6850	0.9475	0.0050	--------	0.0042	0.0008
18.58	2.6900	0.9509	0.0050	--------	0.0042	0.0008
18.67	2.6950	0.9544	0.0050	--------	0.0042	0.0008
18.75	2.7000	0.9578	0.0050	--------	0.0042	0.0008
18.83	2.7050	0.9613	0.0050	--------	0.0042	0.0008
18.92	2.7100	0.9647	0.0050	--------	0.0042	0.0008
19.00	2.7150	0.9682	0.0050	--------	0.0042	0.0008
19.08	2.7195	0.9713	0.0045	--------	0.0042	0.0003
19.17	2.7240	0.9744	0.0045	--------	0.0042	0.0003
19.25	2.7285	0.9776	0.0045	--------	0.0042	0.0003
19.33	2.7330	0.9807	0.0045	--------	0.0042	0.0003
19.42	2.7375	0.9838	0.0045	--------	0.0042	0.0003
19.50	2.7420	0.9869	0.0045	--------	0.0042	0.0003
19.58	2.7470	0.9904	0.0050	--------	0.0042	0.0008
19.67	2.7520	0.9939	0.0050	--------	0.0042	0.0008
19.75	2.7570	0.9974	0.0050	--------	0.0042	0.0008
19.83	2.7620	1.0009	0.0050	--------	0.0042	0.0008
19.92	2.7670	1.0044	0.0050	--------	0.0042	0.0008
20.00	2.7720	1.0079	0.0050	--------	0.0042	0.0008
20.08	2.7775	1.0117	0.0055	--------	0.0042	0.0013
20.17	2.7830	1.0156	0.0055	--------	0.0042	0.0013
20.25	2.7885	1.0194	0.0055	--------	0.0042	0.0013
20.33	2.7940	1.0233	0.0055	--------	0.0042	0.0013
20.42	2.7995	1.0272	0.0055	--------	0.0042	0.0013

20.50	2.8050	1.0310	0.0055	--------	0.0042	0.0013
20.58	2.8100	1.0345	0.0050	--------	0.0042	0.0008
20.67	2.8150	1.0381	0.0050	--------	0.0042	0.0008
20.75	2.8200	1.0416	0.0050	--------	0.0042	0.0008
20.83	2.8250	1.0451	0.0050	--------	0.0042	0.0008
20.92	2.8300	1.0486	0.0050	--------	0.0042	0.0008
21.00	2.8350	1.0522	0.0050	--------	0.0042	0.0008
21.08	2.8395	1.0554	0.0045	--------	0.0042	0.0003
21.17	2.8440	1.0585	0.0045	--------	0.0042	0.0003
21.25	2.8485	1.0617	0.0045	--------	0.0042	0.0003
21.33	2.8530	1.0649	0.0045	--------	0.0042	0.0003
21.42	2.8575	1.0681	0.0045	--------	0.0042	0.0003
21.50	2.8620	1.0713	0.0045	--------	0.0042	0.0003
21.58	2.8665	1.0745	0.0045	--------	0.0042	0.0003
21.67	2.8710	1.0777	0.0045	--------	0.0042	0.0003
21.75	2.8755	1.0809	0.0045	--------	0.0042	0.0003
21.83	2.8800	1.0841	0.0045	--------	0.0042	0.0003
21.92	2.8845	1.0873	0.0045	--------	0.0042	0.0003
22.00	2.8890	1.0905	0.0045	--------	0.0042	0.0003
22.08	2.8935	1.0937	0.0045	--------	0.0042	0.0003
22.17	2.8980	1.0969	0.0045	--------	0.0042	0.0003
22.25	2.9025	1.1002	0.0045	--------	0.0042	0.0003
22.33	2.9070	1.1034	0.0045	--------	0.0042	0.0003
22.42	2.9115	1.1066	0.0045	--------	0.0042	0.0003
22.50	2.9160	1.1098	0.0045	--------	0.0042	0.0003
22.58	2.9205	1.1130	0.0045	--------	0.0042	0.0003
22.67	2.9250	1.1163	0.0045	--------	0.0042	0.0003
22.75	2.9295	1.1195	0.0045	--------	0.0042	0.0003
22.83	2.9340	1.1227	0.0045	--------	0.0042	0.0003
22.92	2.9385	1.1260	0.0045	--------	0.0042	0.0003
23.00	2.9430	1.1292	0.0045	--------	0.0042	0.0003
23.08	2.9480	1.1328	0.0050	--------	0.0042	0.0008
23.17	2.9530	1.1364	0.0050	--------	0.0042	0.0008
23.25	2.9580	1.1400	0.0050	--------	0.0042	0.0008
23.33	2.9630	1.1436	0.0050	--------	0.0042	0.0008
23.42	2.9680	1.1472	0.0050	--------	0.0042	0.0008
23.50	2.9730	1.1508	0.0050	--------	0.0042	0.0008
23.58	2.9775	1.1541	0.0045	--------	0.0042	0.0003
23.67	2.9820	1.1573	0.0045	--------	0.0042	0.0003
23.75	2.9865	1.1606	0.0045	--------	0.0042	0.0003
23.83	2.9910	1.1639	0.0045	--------	0.0042	0.0003
23.92	2.9955	1.1671	0.0045	--------	0.0042	0.0003
24.00	3.0000	1.1704	0.0045	--------	0.0042	0.0003

Total soil rain loss = 2.13(In)
Total effective runoff = 0.87(In)

Peak flow rate this hydrograph = 0.25(CFS)
Total runoff volume this hydrograph = 3156.7(Ft3)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0000	0.00	Q	|	|	|	|
0+10	0.0000	0.00	Q	|	|	|	|
0+15	0.0000	0.00	Q	|	|	|	|
0+20	0.0000	0.00	Q	|	|	|	|
0+25	0.0000	0.00	Q	|	|	|	|
0+30	0.0000	0.00	Q	|	|	|	|
0+35	0.0000	0.00	Q	|	|	|	|
0+40	0.0000	0.00	Q	|	|	|	|
0+45	0.0000	0.00	Q	|	|	|	|
0+50	0.0000	0.00	Q	|	|	|	|
0+55	0.0000	0.00	Q	|	|	|	|
1+ 0	0.0000	0.00	Q	|	|	|	|
1+ 5	0.0000	0.00	Q	|	|	|	|
1+10	0.0000	0.00	Q	|	|	|	|
1+15	0.0000	0.00	Q	|	|	|	|
1+20	0.0000	0.00	Q	|	|	|	|
1+25	0.0000	0.00	Q	|	|	|	|
1+30	0.0000	0.00	Q	|	|	|	|
1+35	0.0000	0.00	Q	|	|	|	|

1+40	0.0000	0.00	Q				
1+45	0.0000	0.00	Q				
1+50	0.0000	0.00	Q				
1+55	0.0000	0.00	Q				
2+ 0	0.0000	0.00	Q				
2+ 5	0.0000	0.00	Q				
2+10	0.0000	0.00	Q				
2+15	0.0000	0.00	Q				
2+20	0.0000	0.00	Q				
2+25	0.0000	0.00	Q				
2+30	0.0000	0.00	Q				
2+35	0.0000	0.00	Q				
2+40	0.0000	0.00	Q				
2+45	0.0000	0.00	Q				
2+50	0.0000	0.00	Q				
2+55	0.0000	0.00	Q				
3+ 0	0.0000	0.00	Q				
3+ 5	0.0000	0.00	Q				
3+10	0.0000	0.00	Q				
3+15	0.0000	0.00	Q				
3+20	0.0000	0.00	Q				
3+25	0.0000	0.00	Q				
3+30	0.0000	0.00	Q				
3+35	0.0000	0.00	Q				
3+40	0.0000	0.00	Q				
3+45	0.0000	0.00	Q				
3+50	0.0000	0.00	Q				
3+55	0.0000	0.00	Q				
4+ 0	0.0000	0.00	Q				
4+ 5	0.0000	0.00	Q				
4+10	0.0000	0.00	Q				
4+15	0.0000	0.00	Q				
4+20	0.0000	0.00	Q				
4+25	0.0000	0.00	Q				
4+30	0.0000	0.00	Q				
4+35	0.0000	0.00	Q				
4+40	0.0000	0.00	Q				
4+45	0.0000	0.00	Q				
4+50	0.0000	0.00	Q				
4+55	0.0000	0.00	Q				
5+ 0	0.0000	0.00	Q				
5+ 5	0.0000	0.00	Q				
5+10	0.0000	0.00	Q				
5+15	0.0000	0.00	Q				
5+20	0.0000	0.00	Q				
5+25	0.0000	0.00	Q				
5+30	0.0000	0.00	Q				
5+35	0.0000	0.00	Q				
5+40	0.0000	0.00	Q				
5+45	0.0000	0.00	Q				
5+50	0.0000	0.00	Q				
5+55	0.0000	0.00	Q				
6+ 0	0.0000	0.00	Q				
6+ 5	0.0000	0.00	Q				
6+10	0.0000	0.00	Q				
6+15	0.0000	0.00	Q				
6+20	0.0000	0.00	Q				
6+25	0.0000	0.00	Q				
6+30	0.0000	0.00	Q				
6+35	0.0000	0.00	Q				
6+40	0.0000	0.00	Q				
6+45	0.0000	0.00	Q				
6+50	0.0000	0.00	Q				
6+55	0.0000	0.00	Q				
7+ 0	0.0000	0.00	Q				
7+ 5	0.0000	0.00	Q				
7+10	0.0000	0.00	Q				
7+15	0.0000	0.00	Q				
7+20	0.0001	0.00	Q				
7+25	0.0001	0.01	Q				
7+30	0.0001	0.01	Q				
7+35	0.0002	0.01	Q				
7+40	0.0003	0.02	Q				
7+45	0.0005	0.02	Q				
7+50	0.0007	0.03	Q				
7+55	0.0009	0.03	Q				
8+ 0	0.0011	0.03	Q				
8+ 5	0.0014	0.04	Q				
8+10	0.0018	0.06	Q				

8+15	0.0022	0.07	QV	|	|	|	|
8+20	0.0027	0.08	QV	|	|	|	|
8+25	0.0033	0.08	QV	|	|	|	|
8+30	0.0039	0.09	Q V	|	|	|	|
8+35	0.0046	0.10	Q V	|	|	|	|
8+40	0.0055	0.13	Q V	|	|	|	|
8+45	0.0065	0.14	Q V	|	|	|	|
8+50	0.0076	0.16	Q V	|	|	|	|
8+55	0.0087	0.17	Q V	|	|	|	|
9+ 0	0.0100	0.18	Q V	|	|	|	|
9+ 5	0.0113	0.19	Q V	|	|	|	|
9+10	0.0127	0.21	Q V	|	|	|	|
9+15	0.0142	0.22	Q V	|	|	|	|
9+20	0.0158	0.23	Q V	|	|	|	|
9+25	0.0175	0.24	Q V	|	|	|	|
9+30	0.0192	0.25	|Q V	|	|	|	|
9+35	0.0210	0.25	|Q V	|	|	|	|
9+40	0.0226	0.24	Q V	|	|	|	|
9+45	0.0243	0.24	Q V	|	|	|	|
9+50	0.0259	0.24	Q V	|	|	|	|
9+55	0.0276	0.25	Q V	|	|	|	|
10+ 0	0.0294	0.25	|Q V	|	|	|	|
10+ 5	0.0310	0.24	Q V	|	|	|	|
10+10	0.0322	0.17	Q V	|	|	|	|
10+15	0.0332	0.15	Q V	|	|	|	|
10+20	0.0341	0.14	Q V	|	|	|	|
10+25	0.0351	0.14	Q V	|	|	|	|
10+30	0.0360	0.14	Q V	|	|	|	|
10+35	0.0369	0.13	Q V	|	|	|	|
10+40	0.0376	0.10	Q V	|	|	|	|
10+45	0.0383	0.10	Q V	|	|	|	|
10+50	0.0389	0.09	Q V	|	|	|	|
10+55	0.0396	0.09	Q V	|	|	|	|
11+ 0	0.0402	0.09	Q V	|	|	|	|
11+ 5	0.0408	0.09	Q V	|	|	|	|
11+10	0.0414	0.08	Q V	|	|	|	|
11+15	0.0420	0.08	Q V	|	|	|	|
11+20	0.0425	0.08	Q V	|	|	|	|
11+25	0.0431	0.08	Q V	|	|	|	|
11+30	0.0436	0.08	Q V	|	|	|	|
11+35	0.0442	0.08	Q V	|	|	|	|
11+40	0.0447	0.08	Q V	|	|	|	|
11+45	0.0452	0.08	Q V	|	|	|	|
11+50	0.0457	0.08	Q V	|	|	|	|
11+55	0.0463	0.08	Q V	|	|	|	|
12+ 0	0.0468	0.08	Q V	|	|	|	|
12+ 5	0.0473	0.07	Q V	|	|	|	|
12+10	0.0478	0.07	Q V	|	|	|	|
12+15	0.0483	0.07	Q V	|	|	|	|
12+20	0.0488	0.07	Q V	|	|	|	|
12+25	0.0493	0.07	Q V	|	|	|	|
12+30	0.0497	0.07	Q V	|	|	|	|
12+35	0.0502	0.07	Q V	|	|	|	|
12+40	0.0507	0.07	Q V	|	|	|	|
12+45	0.0511	0.07	Q V	|	|	|	|
12+50	0.0516	0.06	Q V	|	|	|	|
12+55	0.0520	0.06	Q V	|	|	|	|
13+ 0	0.0525	0.06	Q V	|	|	|	|
13+ 5	0.0529	0.06	Q V	|	|	|	|
13+10	0.0533	0.06	Q V	|	|	|	|
13+15	0.0537	0.05	Q V	|	|	|	|
13+20	0.0540	0.05	Q V	|	|	|	|
13+25	0.0544	0.05	Q V	|	|	|	|
13+30	0.0547	0.05	Q V	|	|	|	|
13+35	0.0551	0.05	Q V	|	|	|	|
13+40	0.0554	0.05	Q V	|	|	|	|
13+45	0.0558	0.05	Q V	|	|	|	|
13+50	0.0561	0.05	Q V	|	|	|	|
13+55	0.0564	0.05	Q V	|	|	|	|
14+ 0	0.0567	0.05	Q V	|	|	|	|
14+ 5	0.0570	0.05	Q V	|	|	|	|
14+10	0.0574	0.05	Q V	|	|	|	|
14+15	0.0578	0.06	Q V	|	|	|	|
14+20	0.0582	0.06	Q V	|	|	|	|
14+25	0.0586	0.06	Q V	|	|	|	|
14+30	0.0590	0.06	Q V	|	|	|	|
14+35	0.0594	0.05	Q V	|	|	|	|
14+40	0.0595	0.02	Q V	|	|	|	|
14+45	0.0596	0.02	Q V	|	|	|	|

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14+50       0.0597      0.01  Q        |         |         | V       |
14+55       0.0598      0.01  Q        |         |         |  V      |
15+ 0       0.0599      0.01  Q        |         |         |  V      |
15+ 5       0.0600      0.02  Q        |         |         |  V      |
15+10       0.0602      0.04  Q        |         |         |  V      |
15+15       0.0605      0.04  Q        |         |         |  V      |
15+20       0.0608      0.04  Q        |         |         |  V      |
15+25       0.0611      0.05  Q        |         |         |  V      |
15+30       0.0615      0.05  Q        |         |         |  V      |
15+35       0.0618      0.05  Q        |         |         |   V     |
15+40       0.0621      0.04  Q        |         |         |   V     |
15+45       0.0623      0.04  Q        |         |         |   V     |
15+50       0.0626      0.04  Q        |         |         |   V     |
15+55       0.0629      0.04  Q        |         |         |   V     |
16+ 0       0.0632      0.04  Q        |         |         |   V     |
16+ 5       0.0635      0.04  Q        |         |         |    V    |
16+10       0.0637      0.04  Q        |         |         |    V    |
16+15       0.0639      0.03  Q        |         |         |    V    |
16+20       0.0642      0.03  Q        |         |         |    V    |
16+25       0.0644      0.03  Q        |         |         |    V    |
16+30       0.0647      0.03  Q        |         |         |    V    |
16+35       0.0649      0.04  Q        |         |         |    V    |
16+40       0.0652      0.04  Q        |         |         |    V    |
16+45       0.0654      0.04  Q        |         |         |     V   |
16+50       0.0657      0.04  Q        |         |         |     V   |
16+55       0.0660      0.04  Q        |         |         |     V   |
17+ 0       0.0663      0.04  Q        |         |         |     V   |
17+ 5       0.0665      0.04  Q        |         |         |     V   |
17+10       0.0667      0.03  Q        |         |         |     V   |
17+15       0.0669      0.02  Q        |         |         |     V   |
17+20       0.0670      0.02  Q        |         |         |      V  |
17+25       0.0672      0.02  Q        |         |         |      V  |
17+30       0.0674      0.02  Q        |         |         |      V  |
17+35       0.0675      0.02  Q        |         |         |      V  |
17+40       0.0677      0.03  Q        |         |         |      V  |
17+45       0.0679      0.03  Q        |         |         |      V  |
17+50       0.0681      0.03  Q        |         |         |      V  |
17+55       0.0683      0.03  Q        |         |         |      V  |
18+ 0       0.0685      0.03  Q        |         |         |      V  |
18+ 5       0.0686      0.03  Q        |         |         |      V  |
18+10       0.0687      0.02  Q        |         |         |      V  |
18+15       0.0688      0.01  Q        |         |         |      V  |
18+20       0.0689      0.01  Q        |         |         |       V |
18+25       0.0690      0.01  Q        |         |         |       V |
18+30       0.0690      0.01  Q        |         |         |       V |
18+35       0.0691      0.01  Q        |         |         |       V |
18+40       0.0692      0.01  Q        |         |         |       V |
18+45       0.0693      0.01  Q        |         |         |       V |
18+50       0.0693      0.01  Q        |         |         |       V |
18+55       0.0694      0.01  Q        |         |         |       V |
19+ 0       0.0695      0.01  Q        |         |         |       V |
19+ 5       0.0695      0.01  Q        |         |         |       V |
19+10       0.0696      0.01  Q        |         |         |       V |
19+15       0.0696      0.00  Q        |         |         |       V |
19+20       0.0696      0.00  Q        |         |         |       V |
19+25       0.0697      0.00  Q        |         |         |       V |
19+30       0.0697      0.00  Q        |         |         |       V |
19+35       0.0697      0.00  Q        |         |         |       V |
19+40       0.0698      0.01  Q        |         |         |       V |
19+45       0.0698      0.01  Q        |         |         |       V |
19+50       0.0699      0.01  Q        |         |         |       V |
19+55       0.0700      0.01  Q        |         |         |       V |
20+ 0       0.0700      0.01  Q        |         |         |       V |
20+ 5       0.0701      0.01  Q        |         |         |       V |
20+10       0.0702      0.01  Q        |         |         |       V |
20+15       0.0703      0.02  Q        |         |         |       V |
20+20       0.0704      0.02  Q        |         |         |       V |
20+25       0.0705      0.02  Q        |         |         |       V |
20+30       0.0707      0.02  Q        |         |         |       V |
20+35       0.0708      0.02  Q        |         |         |        V|
20+40       0.0708      0.01  Q        |         |         |        V|
20+45       0.0709      0.01  Q        |         |         |        V|
20+50       0.0710      0.01  Q        |         |         |        V|
20+55       0.0711      0.01  Q        |         |         |        V|
21+ 0       0.0711      0.01  Q        |         |         |        V|
21+ 5       0.0712      0.01  Q        |         |         |        V|
21+10       0.0712      0.01  Q        |         |         |        V|
21+15       0.0713      0.00  Q        |         |         |        V|
21+20       0.0713      0.00  Q        |         |         |        V|
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21+25	0.0713	0.00	Q				V|
21+30	0.0713	0.00	Q				V|
21+35	0.0714	0.00	Q				V|
21+40	0.0714	0.00	Q				V|
21+45	0.0714	0.00	Q				V|
21+50	0.0715	0.00	Q				V|
21+55	0.0715	0.00	Q				V|
22+ 0	0.0715	0.00	Q				V|
22+ 5	0.0715	0.00	Q				V|
22+10	0.0716	0.00	Q				V|
22+15	0.0716	0.00	Q				V|
22+20	0.0716	0.00	Q				V|
22+25	0.0717	0.00	Q				V|
22+30	0.0717	0.00	Q				V|
22+35	0.0717	0.00	Q				V|
22+40	0.0717	0.00	Q				V|
22+45	0.0718	0.00	Q				V|
22+50	0.0718	0.00	Q				V|
22+55	0.0718	0.00	Q				V|
23+ 0	0.0718	0.00	Q				V|
23+ 5	0.0719	0.00	Q				V|
23+10	0.0719	0.01	Q				V|
23+15	0.0720	0.01	Q				V|
23+20	0.0721	0.01	Q				V|
23+25	0.0721	0.01	Q				V|
23+30	0.0722	0.01	Q				V|
23+35	0.0723	0.01	Q				V|
23+40	0.0723	0.01	Q				V|
23+45	0.0723	0.00	Q				V|
23+50	0.0724	0.00	Q				V|
23+55	0.0724	0.00	Q				V|
24+ 0	0.0724	0.00	Q				V|
24+ 5	0.0725	0.00	Q				V|
24+10	0.0725	0.00	Q				V|
24+15	0.0725	0.00	Q				V|
24+20	0.0725	0.00	Q				V|
24+25	0.0725	0.00	Q				V|
24+30	0.0725	0.00	Q				V

FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2012
Study date: 07/02/20

117.1574 - IDA AVE APARTMENTS
10-YEAR ROUTING

Program License Serial Number 6313

********** HYDROGRAPH INFORMATION **********

From study/file name: 1574UHPropSite10.rte
********** Hydrograph Information **********
From manual input hydrograph

**********HYDROGRAPH DATA**********
Number of intervals = 1
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 23.410 (CFS)
Total volume = 0.161 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

++
Process from Point/Station 100.000 to Point/Station 100.000
**** RETARDING BASIN ROUTING ****

User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 1
Hydrograph time unit = 5.000 (Min.)
Initial depth in storage basin = 0.00(Ft.)

Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)

Depth vs. Storage and Depth vs. Discharge data:

Basin Depth (Ft.)	Storage (Ac.Ft)	Outflow (CFS)	(S-O*dt/2) (Ac.Ft)	(S+O*dt/2) (Ac.Ft)
0.000	0.000	0.000	0.000	0.000
1.880	0.091	0.001	0.091	0.091
3.750	0.163	0.200	0.162	0.164

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0 5.9 11.71 17.56 23.41	Depth (Ft.)
0.083	23.41	0.00	0.081	O | | | I	1.67
0.167	0.00	0.19	0.161	O | | | |	3.69
0.250	0.00	0.19	0.159	O | | | |	3.65
0.333	0.00	0.19	0.158	O | | | |	3.62
0.417	0.00	0.18	0.157	O | | | |	3.59
0.500	0.00	0.18	0.155	O | | | |	3.55
0.583	0.00	0.18	0.154	O | | | |	3.52
0.667	0.00	0.17	0.153	O | | | |	3.49
0.750	0.00	0.17	0.152	O | | | |	3.46
0.833	0.00	0.17	0.151	O | | | |	3.43
0.917	0.00	0.16	0.150	O | | | |	3.40
1.000	0.00	0.16	0.148	O | | | |	3.37
1.083	0.00	0.16	0.147	O | | | |	3.34
1.167	0.00	0.15	0.146	O | | | |	3.32
1.250	0.00	0.15	0.145	O | | | |	3.29
1.333	0.00	0.15	0.144	O | | | |	3.26
1.417	0.00	0.15	0.143	O | | | |	3.24
1.500	0.00	0.14	0.142	O | | | |	3.21
1.583	0.00	0.14	0.141	O | | | |	3.18
1.667	0.00	0.14	0.140	O | | | |	3.16
1.750	0.00	0.13	0.139	O | | | |	3.14
1.833	0.00	0.13	0.138	O | | | |	3.11
1.917	0.00	0.13	0.138	O | | | |	3.09
2.000	0.00	0.13	0.137	O | | | |	3.07
2.083	0.00	0.12	0.136	O | | | |	3.04
2.167	0.00	0.12	0.135	O | | | |	3.02
2.250	0.00	0.12	0.134	O | | | |	3.00
2.333	0.00	0.12	0.133	O | | | |	2.98
2.417	0.00	0.12	0.132	O | | | |	2.96
2.500	0.00	0.11	0.132	O | | | |	2.94
2.583	0.00	0.11	0.131	O | | | |	2.92
2.667	0.00	0.11	0.130	O | | | |	2.90
2.750	0.00	0.11	0.129	O | | | |	2.88
2.833	0.00	0.11	0.129	O | | | |	2.86
2.917	0.00	0.10	0.128	O | | | |	2.84
3.000	0.00	0.10	0.127	O | | | |	2.82
3.083	0.00	0.10	0.127	O | | | |	2.80
3.167	0.00	0.10	0.126	O | | | |	2.79

3.250	0.00	0.10	0.125	O	|	|	|	2.77
3.333	0.00	0.09	0.125	O	|	|	|	2.75
3.417	0.00	0.09	0.124	O	|	|	|	2.73
3.500	0.00	0.09	0.123	O	|	|	|	2.72
3.583	0.00	0.09	0.123	O	|	|	|	2.70
3.667	0.00	0.09	0.122	O	|	|	|	2.69
3.750	0.00	0.09	0.121	O	|	|	|	2.67
3.833	0.00	0.08	0.121	O	|	|	|	2.66
3.917	0.00	0.08	0.120	O	|	|	|	2.64
4.000	0.00	0.08	0.120	O	|	|	|	2.63
4.083	0.00	0.08	0.119	O	|	|	|	2.61
4.167	0.00	0.08	0.119	O	|	|	|	2.60
4.250	0.00	0.08	0.118	O	|	|	|	2.59
4.333	0.00	0.07	0.118	O	|	|	|	2.57
4.417	0.00	0.07	0.117	O	|	|	|	2.56
4.500	0.00	0.07	0.117	O	|	|	|	2.55
4.583	0.00	0.07	0.116	O	|	|	|	2.53
4.667	0.00	0.07	0.116	O	|	|	|	2.52
4.750	0.00	0.07	0.115	O	|	|	|	2.51
4.833	0.00	0.07	0.115	O	|	|	|	2.50
4.917	0.00	0.07	0.114	O	|	|	|	2.48
5.000	0.00	0.06	0.114	O	|	|	|	2.47
5.083	0.00	0.06	0.113	O	|	|	|	2.46
5.167	0.00	0.06	0.113	O	|	|	|	2.45
5.250	0.00	0.06	0.113	O	|	|	|	2.44
5.333	0.00	0.06	0.112	O	|	|	|	2.43
5.417	0.00	0.06	0.112	O	|	|	|	2.42
5.500	0.00	0.06	0.111	O	|	|	|	2.41
5.583	0.00	0.06	0.111	O	|	|	|	2.40
5.667	0.00	0.06	0.111	O	|	|	|	2.39
5.750	0.00	0.05	0.110	O	|	|	|	2.38
5.833	0.00	0.05	0.110	O	|	|	|	2.37
5.917	0.00	0.05	0.109	O	|	|	|	2.36
6.000	0.00	0.05	0.109	O	|	|	|	2.35
6.083	0.00	0.05	0.109	O	|	|	|	2.34
6.167	0.00	0.05	0.108	O	|	|	|	2.33
6.250	0.00	0.05	0.108	O	|	|	|	2.32
6.333	0.00	0.05	0.108	O	|	|	|	2.31
6.417	0.00	0.05	0.107	O	|	|	|	2.31
6.500	0.00	0.05	0.107	O	|	|	|	2.30
6.583	0.00	0.04	0.107	O	|	|	|	2.29
6.667	0.00	0.04	0.106	O	|	|	|	2.28
6.750	0.00	0.04	0.106	O	|	|	|	2.27
6.833	0.00	0.04	0.106	O	|	|	|	2.27
6.917	0.00	0.04	0.106	O	|	|	|	2.26
7.000	0.00	0.04	0.105	O	|	|	|	2.25
7.083	0.00	0.04	0.105	O	|	|	|	2.24
7.167	0.00	0.04	0.105	O	|	|	|	2.24
7.250	0.00	0.04	0.105	O	|	|	|	2.23
7.333	0.00	0.04	0.104	O	|	|	|	2.22
7.417	0.00	0.04	0.104	O	|	|	|	2.22
7.500	0.00	0.04	0.104	O	|	|	|	2.21
7.583	0.00	0.04	0.103	O	|	|	|	2.20
7.667	0.00	0.03	0.103	O	|	|	|	2.20

7.750	0.00	0.03	0.103	O	|	|	|	2.19
7.833	0.00	0.03	0.103	O	|	|	|	2.19
7.917	0.00	0.03	0.103	O	|	|	|	2.18
8.000	0.00	0.03	0.102	O	|	|	|	2.17
8.083	0.00	0.03	0.102	O	|	|	|	2.17
8.167	0.00	0.03	0.102	O	|	|	|	2.16
8.250	0.00	0.03	0.102	O	|	|	|	2.16
8.333	0.00	0.03	0.101	O	|	|	|	2.15
8.417	0.00	0.03	0.101	O	|	|	|	2.15
8.500	0.00	0.03	0.101	O	|	|	|	2.14
8.583	0.00	0.03	0.101	O	|	|	|	2.14
8.667	0.00	0.03	0.101	O	|	|	|	2.13
8.750	0.00	0.03	0.100	O	|	|	|	2.13
8.833	0.00	0.03	0.100	O	|	|	|	2.12
8.917	0.00	0.03	0.100	O	|	|	|	2.12
9.000	0.00	0.03	0.100	O	|	|	|	2.11
9.083	0.00	0.03	0.100	O	|	|	|	2.11
9.167	0.00	0.02	0.100	O	|	|	|	2.10
9.250	0.00	0.02	0.099	O	|	|	|	2.10
9.333	0.00	0.02	0.099	O	|	|	|	2.09
9.417	0.00	0.02	0.099	O	|	|	|	2.09
9.500	0.00	0.02	0.099	O	|	|	|	2.09
9.583	0.00	0.02	0.099	O	|	|	|	2.08
9.667	0.00	0.02	0.099	O	|	|	|	2.08
9.750	0.00	0.02	0.098	O	|	|	|	2.07
9.833	0.00	0.02	0.098	O	|	|	|	2.07
9.917	0.00	0.02	0.098	O	|	|	|	2.07
10.000	0.00	0.02	0.098	O	|	|	|	2.06
10.083	0.00	0.02	0.098	O	|	|	|	2.06
10.167	0.00	0.02	0.098	O	|	|	|	2.06
10.250	0.00	0.02	0.098	O	|	|	|	2.05
10.333	0.00	0.02	0.097	O	|	|	|	2.05
10.417	0.00	0.02	0.097	O	|	|	|	2.05
10.500	0.00	0.02	0.097	O	|	|	|	2.04
10.583	0.00	0.02	0.097	O	|	|	|	2.04
10.667	0.00	0.02	0.097	O	|	|	|	2.04
10.750	0.00	0.02	0.097	O	|	|	|	2.03
10.833	0.00	0.02	0.097	O	|	|	|	2.03
10.917	0.00	0.02	0.097	O	|	|	|	2.03
11.000	0.00	0.02	0.097	O	|	|	|	2.02
11.083	0.00	0.02	0.096	O	|	|	|	2.02
11.167	0.00	0.02	0.096	O	|	|	|	2.02
11.250	0.00	0.02	0.096	O	|	|	|	2.02
11.333	0.00	0.02	0.096	O	|	|	|	2.01
11.417	0.00	0.01	0.096	O	|	|	|	2.01
11.500	0.00	0.01	0.096	O	|	|	|	2.01
11.583	0.00	0.01	0.096	O	|	|	|	2.00
11.667	0.00	0.01	0.096	O	|	|	|	2.00
11.750	0.00	0.01	0.096	O	|	|	|	2.00
11.833	0.00	0.01	0.096	O	|	|	|	2.00
11.917	0.00	0.01	0.095	O	|	|	|	1.99
12.000	0.00	0.01	0.095	O	|	|	|	1.99
12.083	0.00	0.01	0.095	O	|	|	|	1.99
12.167	0.00	0.01	0.095	O	|	|	|	1.99

12.250	0.00	0.01	0.095	O	|	|	|	1.99
12.333	0.00	0.01	0.095	O	|	|	|	1.98
12.417	0.00	0.01	0.095	O	|	|	|	1.98
12.500	0.00	0.01	0.095	O	|	|	|	1.98
12.583	0.00	0.01	0.095	O	|	|	|	1.98
12.667	0.00	0.01	0.095	O	|	|	|	1.98
12.750	0.00	0.01	0.095	O	|	|	|	1.97
12.833	0.00	0.01	0.095	O	|	|	|	1.97
12.917	0.00	0.01	0.094	O	|	|	|	1.97
13.000	0.00	0.01	0.094	O	|	|	|	1.97
13.083	0.00	0.01	0.094	O	|	|	|	1.97
13.167	0.00	0.01	0.094	O	|	|	|	1.96
13.250	0.00	0.01	0.094	O	|	|	|	1.96
13.333	0.00	0.01	0.094	O	|	|	|	1.96
13.417	0.00	0.01	0.094	O	|	|	|	1.96
13.500	0.00	0.01	0.094	O	|	|	|	1.96
13.583	0.00	0.01	0.094	O	|	|	|	1.96
13.667	0.00	0.01	0.094	O	|	|	|	1.95
13.750	0.00	0.01	0.094	O	|	|	|	1.95
13.833	0.00	0.01	0.094	O	|	|	|	1.95
13.917	0.00	0.01	0.094	O	|	|	|	1.95
14.000	0.00	0.01	0.094	O	|	|	|	1.95
14.083	0.00	0.01	0.094	O	|	|	|	1.95
14.167	0.00	0.01	0.093	O	|	|	|	1.94
14.250	0.00	0.01	0.093	O	|	|	|	1.94
14.333	0.00	0.01	0.093	O	|	|	|	1.94
14.417	0.00	0.01	0.093	O	|	|	|	1.94
14.500	0.00	0.01	0.093	O	|	|	|	1.94
14.583	0.00	0.01	0.093	O	|	|	|	1.94
14.667	0.00	0.01	0.093	O	|	|	|	1.94
14.750	0.00	0.01	0.093	O	|	|	|	1.94
14.833	0.00	0.01	0.093	O	|	|	|	1.93
14.917	0.00	0.01	0.093	O	|	|	|	1.93
15.000	0.00	0.01	0.093	O	|	|	|	1.93
15.083	0.00	0.01	0.093	O	|	|	|	1.93
15.167	0.00	0.01	0.093	O	|	|	|	1.93
15.250	0.00	0.01	0.093	O	|	|	|	1.93
15.333	0.00	0.01	0.093	O	|	|	|	1.93
15.417	0.00	0.01	0.093	O	|	|	|	1.93
15.500	0.00	0.01	0.093	O	|	|	|	1.93
15.583	0.00	0.01	0.093	O	|	|	|	1.92
15.667	0.00	0.01	0.093	O	|	|	|	1.92
15.750	0.00	0.01	0.093	O	|	|	|	1.92
15.833	0.00	0.01	0.093	O	|	|	|	1.92
15.917	0.00	0.01	0.093	O	|	|	|	1.92
16.000	0.00	0.01	0.093	O	|	|	|	1.92
16.083	0.00	0.01	0.092	O	|	|	|	1.92
16.167	0.00	0.00	0.092	O	|	|	|	1.92
16.250	0.00	0.00	0.092	O	|	|	|	1.92
16.333	0.00	0.00	0.092	O	|	|	|	1.92
16.417	0.00	0.00	0.092	O	|	|	|	1.91
16.500	0.00	0.00	0.092	O	|	|	|	1.91
16.583	0.00	0.00	0.092	O	|	|	|	1.91
16.667	0.00	0.00	0.092	O	|	|	|	1.91

16.750	0.00	0.00	0.092	O	|	|	|	1.91
16.833	0.00	0.00	0.092	O	|	|	|	1.91
16.917	0.00	0.00	0.092	O	|	|	|	1.91
17.000	0.00	0.00	0.092	O	|	|	|	1.91
17.083	0.00	0.00	0.092	O	|	|	|	1.91
17.167	0.00	0.00	0.092	O	|	|	|	1.91
17.250	0.00	0.00	0.092	O	|	|	|	1.91
17.333	0.00	0.00	0.092	O	|	|	|	1.91
17.417	0.00	0.00	0.092	O	|	|	|	1.91
17.500	0.00	0.00	0.092	O	|	|	|	1.91
17.583	0.00	0.00	0.092	O	|	|	|	1.90
17.667	0.00	0.00	0.092	O	|	|	|	1.90
17.750	0.00	0.00	0.092	O	|	|	|	1.90
17.833	0.00	0.00	0.092	O	|	|	|	1.90
17.917	0.00	0.00	0.092	O	|	|	|	1.90
18.000	0.00	0.00	0.092	O	|	|	|	1.90
18.083	0.00	0.00	0.092	O	|	|	|	1.90
18.167	0.00	0.00	0.092	O	|	|	|	1.90
18.250	0.00	0.00	0.092	O	|	|	|	1.90
18.333	0.00	0.00	0.092	O	|	|	|	1.90
18.417	0.00	0.00	0.092	O	|	|	|	1.90
18.500	0.00	0.00	0.092	O	|	|	|	1.90
18.583	0.00	0.00	0.092	O	|	|	|	1.90
18.667	0.00	0.00	0.092	O	|	|	|	1.90
18.750	0.00	0.00	0.092	O	|	|	|	1.90
18.833	0.00	0.00	0.092	O	|	|	|	1.90
18.917	0.00	0.00	0.092	O	|	|	|	1.90
19.000	0.00	0.00	0.092	O	|	|	|	1.90
19.083	0.00	0.00	0.092	O	|	|	|	1.89
19.167	0.00	0.00	0.092	O	|	|	|	1.89
19.250	0.00	0.00	0.092	O	|	|	|	1.89
19.333	0.00	0.00	0.092	O	|	|	|	1.89
19.417	0.00	0.00	0.091	O	|	|	|	1.89
19.500	0.00	0.00	0.091	O	|	|	|	1.89
19.583	0.00	0.00	0.091	O	|	|	|	1.89
19.667	0.00	0.00	0.091	O	|	|	|	1.89
19.750	0.00	0.00	0.091	O	|	|	|	1.89
19.833	0.00	0.00	0.091	O	|	|	|	1.89
19.917	0.00	0.00	0.091	O	|	|	|	1.89
20.000	0.00	0.00	0.091	O	|	|	|	1.89
20.083	0.00	0.00	0.091	O	|	|	|	1.89
20.167	0.00	0.00	0.091	O	|	|	|	1.89
20.250	0.00	0.00	0.091	O	|	|	|	1.89
20.333	0.00	0.00	0.091	O	|	|	|	1.89
20.417	0.00	0.00	0.091	O	|	|	|	1.89
20.500	0.00	0.00	0.091	O	|	|	|	1.89
20.583	0.00	0.00	0.091	O	|	|	|	1.89
20.667	0.00	0.00	0.091	O	|	|	|	1.89
20.750	0.00	0.00	0.091	O	|	|	|	1.89
20.833	0.00	0.00	0.091	O	|	|	|	1.89
20.917	0.00	0.00	0.091	O	|	|	|	1.89
21.000	0.00	0.00	0.091	O	|	|	|	1.89
21.083	0.00	0.00	0.091	O	|	|	|	1.89
21.167	0.00	0.00	0.091	O	|	|	|	1.89

21.250	0.00	0.00	0.091	O	|	|	|	1.89
21.333	0.00	0.00	0.091	O	|	|	|	1.89
21.417	0.00	0.00	0.091	O	|	|	|	1.88
21.500	0.00	0.00	0.091	O	|	|	|	1.88
21.583	0.00	0.00	0.091	O	|	|	|	1.88
21.667	0.00	0.00	0.091	O	|	|	|	1.88
21.750	0.00	0.00	0.091	O	|	|	|	1.88
21.833	0.00	0.00	0.091	O	|	|	|	1.88
21.917	0.00	0.00	0.091	O	|	|	|	1.88
22.000	0.00	0.00	0.091	O	|	|	|	1.88
22.083	0.00	0.00	0.091	O	|	|	|	1.88
22.167	0.00	0.00	0.091	O	|	|	|	1.88
22.250	0.00	0.00	0.091	O	|	|	|	1.88
22.333	0.00	0.00	0.091	O	|	|	|	1.88
22.417	0.00	0.00	0.091	O	|	|	|	1.88
22.500	0.00	0.00	0.091	O	|	|	|	1.88
22.583	0.00	0.00	0.091	O	|	|	|	1.88
22.667	0.00	0.00	0.091	O	|	|	|	1.88
22.750	0.00	0.00	0.091	O	|	|	|	1.88
22.833	0.00	0.00	0.091	O	|	|	|	1.88
22.917	0.00	0.00	0.091	O	|	|	|	1.88
23.000	0.00	0.00	0.091	O	|	|	|	1.88
23.083	0.00	0.00	0.091	O	|	|	|	1.88
23.167	0.00	0.00	0.091	O	|	|	|	1.88
23.250	0.00	0.00	0.091	O	|	|	|	1.88

Remaining water in basin = 0.09 (Ac.Ft)

**********HYDROGRAPH DATA**********

Number of intervals = 279
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 0.193 (CFS)
Total volume = 0.070 (Ac.Ft)

Status of hydrographs being held in storage

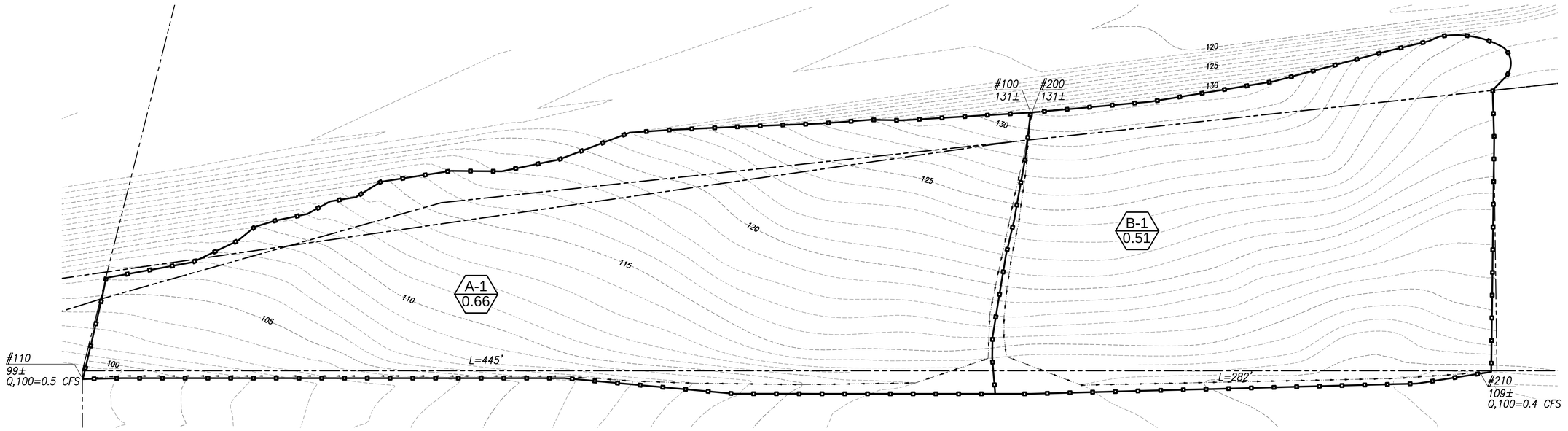
	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

Appendix C

Drainage Exhibits

HYDROLOGY MAP - EXISTING CONDITIONS



LEGEND

- DMA BOUNDARY
- FLOWLINE
- PL
- EXIST CONTOUR
- XXX / XXXX.X — NODE ELEVATION
- X-X / X.X — SUBAREA / ACREAGE

N

20 0 20 40 80

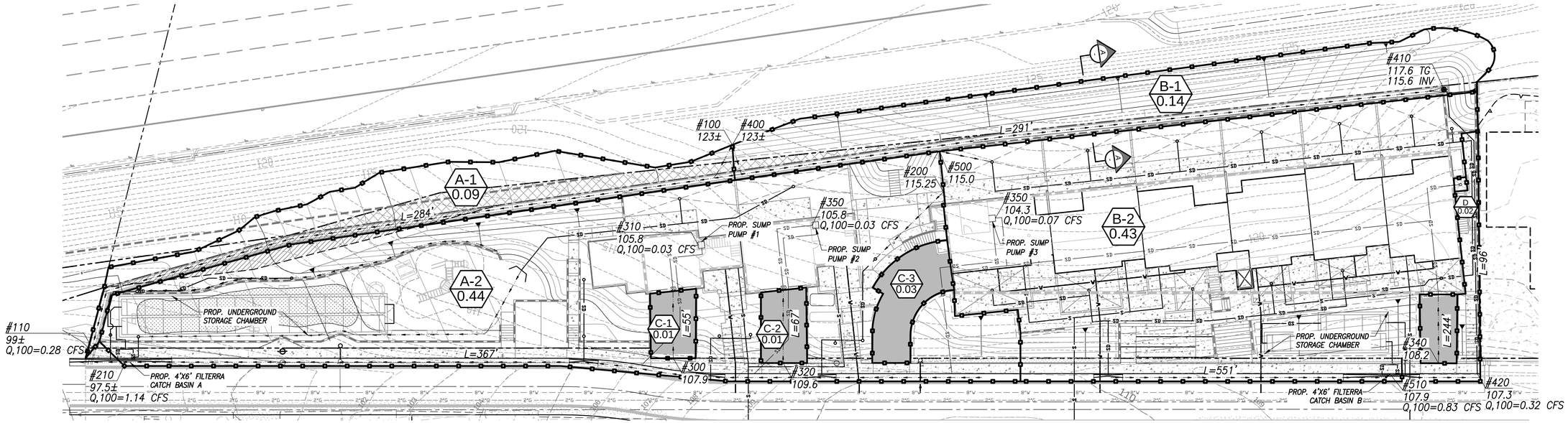
SCALE 1" = 20'

HYDROLOGY MAP - EXISTING CONDITIONS
FOR
IDA AVENUE APARTMENTS
SOLANA BEACH, CA

PREPARED BY:

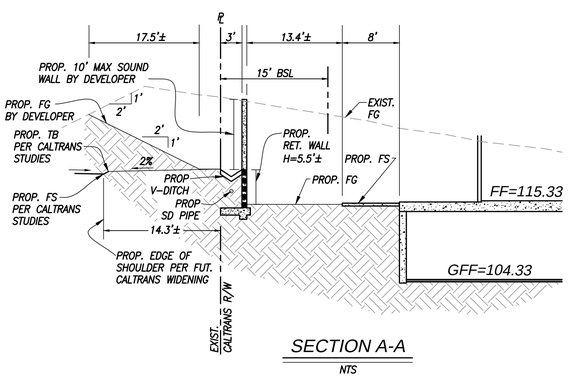
ARMSTRONG & BROOKS CONSULTING ENGINEERS
PLANNING · INFRASTRUCTURE · SITE DEVELOPMENT · WATER RESOURCES
1350 EAST CHASE DRIVE CORONA, CA 92881
MAIL: P.O. BOX 78088 CORONA, CA 92877-998
P: 951 - 879 - 8400 F: 951 - 279 - 8420

HYDROLOGY MAP - PROPOSED CONDITIONS



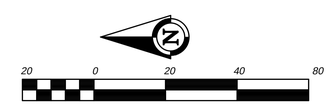
LEGEND

- PROP. AC
- PROP. PCC
- PROP. LDSCP
- TEMPORARY CONSTRUCTION EASEMENT
- CALTRANS PARTIAL TAKE
- DMA BOUNDARY
- FLOWLINE
- PL
- EXIST CONTOUR
- XXX / XXXX.X — NODE / ELEVATION
- X-X / X.X — SUBAREA / ACREAGE



SECTION A-A

NTS



SCALE 1" = 20'

HYDROLOGY MAP - PROPOSED CONDITIONS

FOR

IDA AVENUE APARTMENTS

SOLANA BEACH, CA

PREPARED BY:

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Appendix D-2
Water Quality Technical Report

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A.1 PDP WQTR

CITY OF SOLANA BEACH
PRIORITY DEVELOPMENT PROJECT (PDP) **WATER QUALITY TECHNICAL REPORT (WQTR)** **FOR** **Ida Avenue Apartments** **Case No. 17-17-3** **Ida Avenue** **Solana Beach, CA 92075** **ASSESSOR'S PARCEL NUMBER(S):** **298-162-37**
ENGINEER OF WORK: **Dennis Armstrong** **PE No. 48758** **Armstrong & Brooks Consulting Engineers**

PREPARED FOR:
Shantu Patel
1280 Hoover Street
Carlsbad, CA 92008
(790) 214-8558

PDP WQTR PREPARED BY:
Armstrong & Brooks Consulting Engineers
1350 East Chase Drive
Corona, CA 92881
Mail To:
P.O. Box 78088 Corona, CA 92877
(951) 372-8400

DATE OF WQTR:
May 7, 2021

PLANS PREPARED BY:
Julia Hutchens
1350 East Chase Drive
Corona, CA 92881
Mail To: P.O. Box 78088
Corona, CA 92877
(951) 372-8400

TABLE OF CONTENTS

Acronym Sheet
PDP WQTR Preparer's Certification Page
PDP WQTR Project Owner's Certification Page
Submittal Record
Project Vicinity Map
FORM 1 Site Information Checklist for PDPs
FORM 2 Source Control BMP Checklist for All Development Projects
FORM 3 Site Design/LID BMP Checklist for All Development Projects
FORM 4 Summary of PDP Structural BMPs
FORM 5 Harvest and Use Feasibility Checklist
FORM 6 Categorization of Infiltration Feasibility Condition
FORM 7 Factor of Safety and Design Infiltration Rate Worksheet
FORM 8 Downstream Systems Requirements for Preservation of Coarse Sediment Supply

Attachment 1: Backup for PDP Pollutant Control BMPs
- Attachment 1a: DMA Exhibit
- Attachment 1b: Tabular Summary of DMAs and Design Capture Volume Calculations (Worksheet 1.b)
- Attachment 1c: Harvest and Use Feasibility Screening (when applicable)
- Attachment 1d: Categorization of Infiltration Feasibility Condition (when applicable)
- Attachment 1e: Pollutant Control BMP Design Worksheets / Calculations

Attachment 2: Backup for PDP Hydromodification Control Measures
- Attachment 2a: Hydromodification Management Exhibit
- Attachment 2b: Management of Critical Coarse Sediment Yield Areas
- Attachment 2c: Geomorphic Assessment of Receiving Channels
- Attachment 2d: Flow Control Facility Design

Attachment 3: Structural BMP Maintenance Plan
- Attachment 3a: B Structural BMP Maintenance Thresholds and Actions
- Attachment 3b: Draft Maintenance Agreement (when applicable)

Attachment 4: Copy of Plan Sheets Showing Permanent Storm Water BMPs

ACRONYMS

APN	Assessor's Parcel Number
BMP	Best Management Practice
HMP	Hydromodification Management Plan
HSG	Hydrologic Soil Group
MS4	Municipal Separate Storm Sewer System
N/A	Not Applicable
NRCS	Natural Resources Conservation Service
PDP	Priority Development Project
PE	Professional Engineer
SC	Source Control
SD	Site Design
SDRWQCB	San Diego Regional Water Quality Control Board
SIC	Standard Industrial Classification
WQTR	Water Quality Technical Report

PDP WQTR PREPARER'S CERTIFICATION PAGE

Project Name: Ida Avenue Apartments
Permit Application Number: Case No. 17-17-3

PREPARER'S CERTIFICATION

I hereby declare that I am the Engineer in Responsible Charge of design of storm water best management practices (BMPs) for this project, and that I have exercised responsible charge over the design of the BMPs as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with the PDP requirements of the City of Solana Beach BMP Design Manual, which is a design manual for compliance with the City of Solana Beach and the MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2015-0100) requirements for storm water management.

I have read and understand that the City Engineer has adopted minimum requirements for managing urban runoff, including storm water, from land development activities, as described in the BMP Design Manual. I certify that this PDP WQTR has been completed to the best of my ability and accurately reflects the project being proposed and the applicable BMPs proposed to minimize the potentially negative impacts of this project's land development activities on water quality. I understand and acknowledge that the plan check review of this PDP WQTR by the City Engineer is confined to a review and does not relieve me, as the Engineer in Responsible Charge of design of storm water BMPs for this project, of my responsibilities for project design.

Dennis G Armstrong C48758, Exp 9/30/22

Engineer of Work's Signature, PE Number & Expiration Date

Dennis Armstrong

Print Name

Armstrong & Brooks Consulting Engineers

Company

5/23/22

Date

Engineer's Seal:



PDP WQTR PROJECT OWNER'S CERTIFICATION PAGE

Project Name: Ida Avenue Apartments
Permit Application Number: Case No. 17-17-3

PROJECT OWNER'S CERTIFICATION

This PDP WQTR has been prepared for KNN Management, LLC by Armstrong & Brooks Consulting Engineers. The PDP WQTR is intended to comply with the PDP requirements of the City of Solana Beach BMP Design Manual, which is a design manual for compliance with the City of Solana Beach and the MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2015-0100) requirements for storm water management.

The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan. Once the undersigned transfers its interests in the property, its successor-in-interest shall bear the aforementioned responsibility to implement the best management practices (BMPs) described within this plan, including ensuring on-going operation and maintenance of structural BMPs. A signed copy of this document shall be available on the subject property into perpetuity.



Project Owner's Signature

Shantu Patel

Print Name

KNN Management, LLC

Company

5-23-22

Date

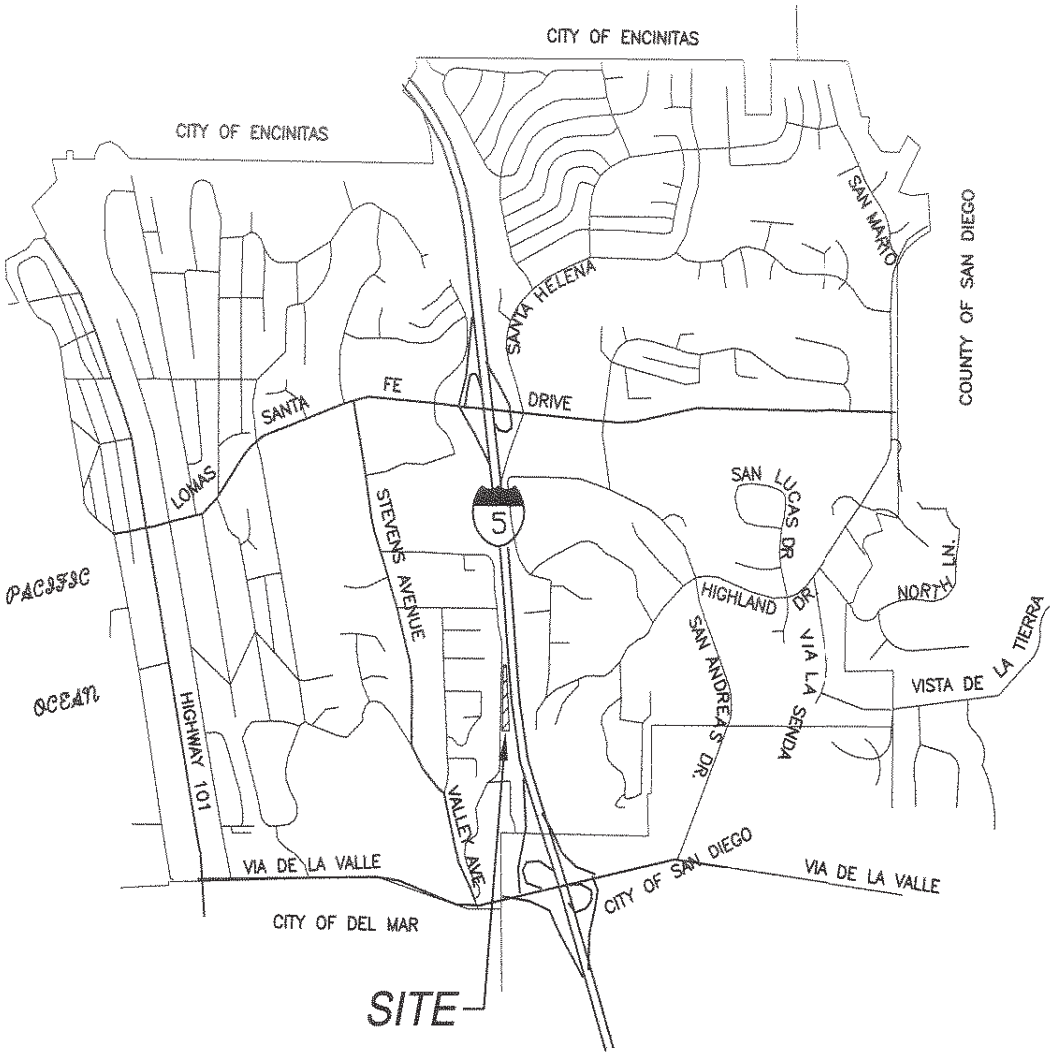
SUBMITTAL RECORD

Use this Table to keep a record of submittals of this PDP WQTR. Each time the PDP WQTR is re-submitted, provide the date and status of the project. In column 4 summarize the changes that have been made or indicate if response to plancheck comments is included. When applicable, insert response to plancheck comments behind this page.

Submittal Number	Date	Project Status	Summary of Changes
1	2/01/18	☒ Preliminary Design / Planning/ CEQA ☐ Final Design	Initial Submittal
2	5/17/18	☒ Preliminary Design / Planning/ CEQA ☐ Final Design	2nd Submittal
3	7/10/20	☒ Preliminary Design / Planning/ CEQA ☐ Final Design	3rd Submittal
4		☐ Preliminary Design / Planning/ CEQA ☐ Final Design	

PROJECT VICINITY MAP

Project Name: Ida Avenue Apartments
Permit Application Number: Case No. 17-17-3



Site Information Checklist For PDPs	Form 1 (PDPs) City of Solana Beach BMP Design Manual
Project Summary Information:	
Project Name:	Ida Avenue Apartments
Project Address:	748 Ida Avenue Solana Beach, CA, 92075
Assessor's Parcel Number(s) (APN(s))	298-162-37
Permit Application Number	Case No. 17-17-3
Project Hydrologic Unit	Select One: ☒ San Dieguito (HA Solana Beach, HSA Rancho Santa Fe) 905.11 ☐ Los Peñasquitos (HA Escondido Creek, HAS San Elijo) 904.61
Project Watershed (Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	San Dieguito Hydrologic Unit, Solana Beach HA, Rancho Santa Fe HSA (905.10, 5.11)
Parcel Area (total area of Assessor's Parcel(s) associated with the project)	0.94 Acres (40,401 Square Feet)
Area to be Disturbed by the Project (Project Area)	1.44 Acres (62,189 Square Feet)
Project Proposed Impervious Area (subset of Project Area)	0.92 Acres (39,878 Square Feet)
Project Proposed Pervious Area (subset of Project Area)	0.52 Acres (22,311 Square Feet)

Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project.

This may be less than the Parcel Area.

Form 1

Description of Existing Site Condition

Current Status of the Site (select all that apply):

☐ Existing development
☐ Previously graded but not built out
☐ Demolition completed without new construction
☐ Agricultural or other non-impervious use
☒ Vacant, undeveloped/natural

Description / Additional Information:

The site lies on a 3 to 1 slope of undeveloped land in between the I-5 and Ida Ave.

Existing Land Cover Includes (select all that apply):

☒ Vegetative Cover
☐ Non-Vegetated Pervious Areas
☐ Impervious Areas

Description / Additional Information:

The site is moderately covered with natural shrubs and grasses. There are no existing improvements or impervious areas.

Underlying Soil belongs to Hydrologic Soil Group (select all that apply):

☒ NRCS Type A
☐ NRCS Type B
☐ NRCS Type C
☐ NRCS Type D

Approximate Depth to Groundwater (GW):

☐ GW Depth < 5 feet
☐ 5 feet < GW Depth < 10 feet
☐ 10 feet < GW Depth < 20 feet
☒ GW Depth > 20 feet

Form 1

Existing Natural Hydrologic Features (select all that apply):

☐ Watercourses
☐ Seeps
☐ Springs
☐ Wetlands
☒ None

Description / Additional Information:

Existing Conditions:

An existing ridge traverses from east to west and divides the site into two main drainage management areas (DMA)s: DMA A and DMA B. Offsite flows begin easterly of the proposed site at a high point along a ridge adjacent to the I-5 within CALTRANS right of way. Existing offsite flows sheet flow northeasterly towards Ida Avenue. Runoff is captured by an existing natural swale easterly of Ida Avenue. Flows are divided by an existing high point within Ida Avenue which forces flows to run northerly or southerly along Ida Avenue. The site outlet from the proposed project was used to determine the tributary area under the existing conditions to compare pre and post-development flows and volumes.

How is storm water runoff conveyed from the site? At a minimum, this description should answer:

(1) whether existing drainage conveyance is natural or urban;

(2) Is runoff from offsite conveyed through the site? if yes, quantify all offsite drainage areas, design flows, and locations where offsite flows enter the project site, and summarize how such flows are conveyed through the site;

(3) Provide details regarding existing project site drainage conveyance network, including any existing storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural or constructed channels; and

(4) Identify all discharge locations from the existing project site along with a summary of conveyance system size and capacity for each of the discharge locations. Provide summary of the pre-project drainage areas and design flows to each of the existing runoff discharge locations.

Describe existing site drainage patterns:

1. *Existing drainage conveyance is natural.*

2. *The CALTRANS off-site area, east of the site, of 0.17 acres is conveyed through the proposed site. Flows are divided by a high point along the project boundary. Off-site flows are conveyed either northwesterly or southwesterly towards Ida Avenue. Additional off-site area, west of the site, in Ida Avenue is approximately 0.33 acres. The runoff from this area sheets easterly towards the site and is conveyed via natural swale along the westerly edge of the site.*

3. *There are no existing storm drain on site. A natural ridge line divides the site into two DMAs, where flow "sheets" northwesterly or southwesterly towards Ida Avenue.*

4. *A high point exists midway along Ida Avenue, directing a portion of the street southerly and a portion northerly. The northerly portion of the existing site has a 100-year runoff of 0.8 cfs; the southerly portion has a 100-year runoff of 0.7 cfs. Refer to Preliminary Drainage Report for further information.*

Form 1
Description of Proposed Site Development
Project Description / Proposed Land Use and/or Activities: *The proposed site consists of two proposed buildings with eight apartment units, driveways, underground parking, sidewalks, landscaping, and a playground area. Sump pumps will be installed in the underground parking garages. Sumps pumps will capture runoff from a filtered trench storm drain inlet before conveying flow towards Ida Avenue. Drop inlet catch basins and HDPE pipe will be installed to convey flow generated onsite onto Ida Ave. Two 4'x6' Filterra catch basins will be constructed on Ida Ave. to treat the low flows generated onsite. Additional catch basin inlets will be constructed downstream of the Filterras to capture high flows to be stored. The flows will then be conveyed to ADS perforated underground storage chambers to detain the post-development 10-year volumes. These flows will be detained and infiltrated into the ground. For storms higher than the 10-year, flows will be bypassed via overflow lines and continue along Ida Ave. to perpetuate pre-development flow patterns and quantities.* *Offsite flows generated upstream of the site within DMAs A-1 and B-1 will be conveyed around the site via proposed v-ditches and HDPE pipe to prevent comingling with onsite flows.*
List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features): *A total of 8 residential, two story apartments in 2 buildings (one building of 6 units and one building of 2 units). 6 Unit Building = 10,875 S.F.; 2 Unit Building = 5,463 S.F. Impervious driveways will connect Ida Ave. to underground parking garages. The project also consists of limited sidewalk and retaining wall improvements.*

List/describe proposed pervious features of the project (e.g., landscape areas):

The project will construct pervious landscape features and maximize pervious features to the maximum extent practicable. A pervious play area will be constructed at the northerly limits of the site.

Does the project include grading and changes to site topography?

☒ Yes
☐ No

Description / Additional Information:

Pads are being cut into the existing slope to minimize the impact to existing site lines of the surrounding properties. Retaining walls will be constructed to grade pads for the apartment lots. In addition, there will be underground parking garages located under proposed apartment buildings.

Does the project include changes to site drainage (e.g., installation of new storm water conveyance systems)?

☒ Yes
☐ No

If yes, provide details regarding the proposed project site drainage conveyance network, including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural or constructed channels, and the method for conveying offsite flows through or around the proposed project site. Identify all discharge locations from the proposed project site along with a summary of the conveyance system size and capacity for each of the discharge locations. Provide a summary of pre- and post-project drainage areas and design flows to each of the runoff discharge locations. Reference the drainage study for detailed calculations.

Describe proposed site drainage patterns:

The proposed site consists of two proposed buildings with eight apartment units, driveways, underground parking, sidewalks, landscaping, and a playground area. Sump pumps will be installed in the underground parking garages to convey flow towards Ida Avenue for treatment. V-ditches, drop inlet catch basins and HDPE pipe will be installed to convey onsite flow towards Ida Ave. Two 4'x6' Filterra catch basins will be constructed on Ida Ave. to treat the low flows generated onsite. Additional catch basin inlets will be constructed downstream of the Filterras to capture high flows to be stored. After treatment, flows will then be conveyed to ADS perforated underground storage chambers to detain the post-development 10-year volumes. These flows will be detained and infiltrated into the ground. For storms higher than the 10-year, flows will be bypassed via overflow lines and continue along Ida Ave. to perpetuate pre-development flow patterns and quantities. There are two proposed under sidewalk discharge locations located on Ida Avenue adjacent to the project's northwesterly and southwesterly boundary.

The proposed site was divided into two DMAs to perpetuate existing drainage patterns, A-2 and B-2, and three additional DMAs, C-1, C-2, and C-3, where created to represent the areas that flow to the sump pumps. DMA D is an onsite portion that is not captured by the proposed storm drain system. This area drains westerly towards Ida Ave and is conveyed south. DMA A-1B and B-1B are part of the 0.94-acre on-site area that will be taken out by CALTRANS in a future ROW project so they will be treated as off-site areas. DMA A-1C and B-1C are also part of the 0.94-acre on-site area; these areas represent the concrete v-ditch being used to conveyed the off-site flow around the site so the DMAs will be treated as off-site areas

Offsite flows generated upstream of the site from 0.17 acres in the CALTRANS right of way (DMA A-1A and B-1A) will be captured before coming onsite and conveyed within a 12-inch V-ditch (DMA A-1C and B-1C) along the easterly edge before entering into a proposed storm drain line and discharging along Ida Avenue. Offsite flows generated from the 0.33 acres in Ida Avenue (E-1 and E-2) will be conveyed via proposed curb and gutter along the easterly edge of the street. The northerly portion of this area will be conveyed to Filterra Catch Basin A and the southerly portion of this area will be conveyed to Filterra Catch Basin B.

DMA A-2 is the onsite northerly watershed tributary to Ida Ave, Filterra Catch Basin A, and Point of Connection 1 (POC 1). DMA A-2 generates a 100-year onsite flow of 1.02 CFS. DMA B-2 is the onsite southerly watershed tributary to Ida Ave, Filterra Catch Basin B, and POC 2. DMA B-2 generates a 100-year onsite flow of 0.87 CFS.

A unit hydrograph model for proposed conditions was created to determine the total volume of runoff generated from the on-site area, approximately 0.94 acres. The 10-year volume generated from the site was found to be 7,570 CF. This volume will be stored within two separate storage chamber systems distributed between DMA A-2 and B-2. For detailed explanation of hydrology and routing calculations, see the corresponding drainage study.

Form 1

Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply):

☒ On-site storm drain inlets
☐ Interior floor drains and elevator shaft sump pumps
☒ Interior parking garages
☐ Need for future indoor & structural pest control
☐ Landscape/Outdoor Pesticide Use
☐ Pools, spas, ponds, decorative fountains, and other water features
☐ Food service
☐ Refuse areas
☐ Industrial processes
☐ Outdoor storage of equipment or materials
☐ Vehicle and Equipment Cleaning
☐ Vehicle/Equipment Repair and Maintenance
☐ Fuel Dispensing Areas
☐ Loading Docks
☐ Fire Sprinkler Test Water
☐ Miscellaneous Drain or Wash Water
☒ Plazas, sidewalks, and parking lots
☒ Interior Floor Drains with Sump Pumps

Description / Additional Information:

Form 1
Identification and Narrative of Receiving Water and Pollutants of Concern
Describe flow path of storm water from the project site discharge location(s), through urban storm conveyance systems as applicable, to receiving creeks, rivers, and lagoons as applicable, and ultimate discharge to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable): *Flows generated onsite will be treated and detained onsite. Overflow and bypassed flows will continue to discharge to Ida Ave. and will be capture in storm drain catch basins downstream. The existing Solana Beach storm drain conveyance system will convey flows to the San Dieguito River.*
List any 303(d) impaired water bodies within the path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable), identify the pollutant(s)/stressor(s) causing impairment, and identify any TMDLs and/or Highest Priority Pollutants from the WQIP for the impaired water bodies:

303(d) Impaired Water Body	**Pollutant(s)/Stressor(s)**	**TMDLs / WQIP Highest Priority Pollutant**
San Dieguito River	Enterococci, fecal coliform, nitrogen, phosphorus, TDS, toxicity	Nutrients / eutrophication / oxygen depletion, silt and sediment, toxicity, pathogens, salinity and dissolved solids, litter / trash / debris

Identification of Project Site Pollutants*

***Identification of project site pollutants is only required if flow-through treatment BMPs are implemented onsite in lieu of retention or biofiltration BMPs (note the project must also participate in an alternative compliance program unless prior lawful approval to meet earlier PDP requirements is demonstrated)**

Identify pollutants expected from the project site based on all proposed use(s) of the site (see BMP Design Manual Appendix B.6):

Form 1			
Pollutant	**Not Applicable to the Project Site**	**Expected from the Project Site**	**Also a Receiving Water Pollutant of Concern**
Sediment	X		X
Nutrients	X		
Heavy Metals	X		
Organic Compounds	X		
Trash & Debris		X	X
Oxygen Demanding Substances	X		
Oil & Grease		X	
Bacteria & Viruses	X		
Pesticides	X		

Form 1
Hydromodification Management Requirements

Do hydromodification management requirements apply (see Section 1.6 of the BMP Design Manual)?

☒ Yes, hydromodification management flow control structural BMPs required.
☐ No, the project will discharge runoff directly to existing underground storm drains discharging directly to an exempt receiving water such as the Pacific Ocean, and exempt river reach, or a tidally-influenced area.
☐ No, the project will discharge runoff directly to conveyance channels whose bed and bank are concrete-lined all the way from the point of discharge to the Pacific Ocean, a tidally-influenced area, or an exempt river reach.
☐ No, the project will discharge runoff directly to an area identified as appropriate for an exemption by the WMAA for the watershed in which the project resides.

Description / Additional Information (to be provided if a 'No' answer has been selected above):

Form 1
Critical Coarse Sediment Yield Areas*   ***This Section only required if hydromodification management requirements apply**

Based on the maps provided within the WMAA, do potential critical coarse sediment yield areas exist within the project drainage boundaries?

☐ Yes
☒ No, No critical coarse sediment yield areas to be protected based on WMAA maps

If yes, have any of the optional analyses presented in Section 6.2 of the BMP Design Manual been performed?

☐ 6.2.1 Verification of Geomorphic Landscape Units (GLUs) Onsite
☐ 6.2.2 Downstream Systems Sensitivity to Coarse Sediment
☐ 6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite
☐ No optional analyses performed, the project will avoid critical coarse sediment yield areas identified based on WMAA maps

If optional analyses were performed, what is the final result?

☐ No critical coarse sediment yield areas to be protected based on verification of GLUs onsite
☐ Critical coarse sediment yield areas exist but additional analysis has determined that protection is not required. Documentation attached in Attachment 2.b of the WQTR.
☐ Critical coarse sediment yield areas exist and require protection. The project will implement management measures described in Sections 6.2.4 and 6.2.5 as applicable, and the areas are identified on the WQTR Exhibit.

Discussion / Additional Information:

N/A

Flow Control for Post-Project Runoff*

***This Section only required if hydromodification management requirements apply**

List and describe point(s) of compliance (POCs) for flow control for hydromodification management (see Section 6.3.1). For each POC, provide a POC identification name or number correlating to the project's HMP Exhibit and a receiving channel identification name or number correlating to the project's HMP Exhibit.

DMA A will discharge to POC 1 and DMA B will discharge to POC 2. A site model was created in CivilD software to verify that HCOCs are mitigated.

Has a geomorphic assessment been performed for the receiving channel(s)?

☒ No, the low flow threshold is 0.1Q2 (default low flow threshold)
☐ Yes, the result is the low flow threshold is 0.1Q2
☐ Yes, the result is the low flow threshold is 0.3Q2
☐ Yes, the result is the low flow threshold is 0.5Q2

If a geomorphic assessment has been performed, provide title, date, and preparer:

Discussion / Additional Information: (optional)

Form 1
Other Site Requirements and Constraints
When applicable, list other site requirements or constraints that will influence storm water management design, such as zoning requirements including setbacks and open space, or local codes governing minimum street width, sidewalk construction, allowable pavement types, and drainage requirements. N/A

Form 1
Optional Additional Information or Continuation of Previous Sections As Needed
This space provided for additional information or continuation of information from previous sections as needed. N/A

Source Control BMP Checklist for All Development Projects	Form 2 (PDPs) City of Solana Beach BMP Design Manual

Project Identification

Project Name: Ida Avenue Apartments

Permit Application Number: Case No. 17-17-3

Source Control BMPs

All development projects must implement source control BMPs SC-1 through SC-6 where applicable and feasible. See Chapter 4 and Appendix E of the BMP Design Manual for information to implement source control BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the source control BMP as described in Chapter 4 and/or Appendix E of the City of Solana Beach BMP Design Manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification may be provided.

Source Control Requirement	Applied?		
SC-1 Prevention of Illicit Discharges into the MS4	☒ Yes	☐ No	☐ N/A
Discussion / justification if SC-1 not implemented:			
SC-2 Storm Drain Stenciling or Signage	☒ Yes	☐ No	☐ N/A
Discussion / justification if SC-2 not implemented:			

Form 2			
Source Control Requirement	**Applied?**		
SC-3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	☒ N/A
Discussion / justification if SC-3 not implemented:			
SC-4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	☒ N/A
Discussion / justification if SC-4 not implemented:			
SC-5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	☒ N/A
Discussion / justification if SC-5 not implemented:			

Form 2			
Source Control Requirement	**Applied?**		
SC-6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below)			
☒ On-site storm drain inlets	☒ Yes	☐ No	☐ N/A
☒ Interior floor drains and elevator shaft sump pumps	☒ Yes	☐ No	☐ N/A
☒ Interior parking garages	☒ Yes	☐ No	☐ N/A
☐ Need for future indoor & structural pest control	☐ Yes	☐ No	☒ N/A
☐ Landscape/Outdoor Pesticide Use	☐ Yes	☐ No	☒ N/A
☐ Pools, spas, ponds, decorative fountains, and other water features	☐ Yes	☐ No	☒ N/A
☐ Food service	☐ Yes	☐ No	☒ N/A
☐ Refuse areas	☐ Yes	☐ No	☒ N/A
☐ Industrial processes	☐ Yes	☐ No	☒ N/A
☐ Outdoor storage of equipment or materials	☐ Yes	☐ No	☒ N/A
☐ Vehicle and Equipment Cleaning	☐ Yes	☐ No	☒ N/A
☐ Vehicle/Equipment Repair and Maintenance	☐ Yes	☐ No	☒ N/A
☐ Fuel Dispensing Areas	☐ Yes	☐ No	☒ N/A
☐ Loading Docks	☐ Yes	☐ No	☒ N/A
☐ Fire Sprinkler Test Water	☐ Yes	☐ No	☒ N/A
☐ Miscellaneous Drain or Wash Water	☐ Yes	☐ No	☒ N/A
☒ Plazas, sidewalks, and parking lots	☒ Yes	☐ No	☐ N/A
Discussion / justification if SC-6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for <u>all</u> "No" answers shown above.			

Site Design/LID BMP Checklist for All Development Projects	Form 3 (PDPs) City of Solana Beach BMP Design Manual

Project Identification

Project Name: Ida Avenue Apartments

Permit Application Number: Case No. 17-17-3

Site Design/LID BMPs

All development projects must implement site design/LID BMPs SD-1 through SD-8 where applicable and feasible. See Chapter 4 and Appendix E of the BMP Design Manual for information to implement site design BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the site design/LID BMP as described in Chapter 4 and/or Appendix E of the City of Solana Beach BMP Design Manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification may be provided.

Site Design Requirement	Applied?		
SD-1 Maintain Natural Drainage Pathways and Hydrologic Features	☐ Yes	☒ No	☐ N/A
Discussion / justification if SD-1 not implemented:			
SD-2 Conserve Natural Areas, Soils, and Vegetation	☒ Yes	☐ No	☐ N/A
Discussion / justification if SD-2 not implemented:			

Form 3			
Source Control Requirement	**Applied?**		
SD-3 Minimize Impervious Area	☒ Yes	☐ No	☐ N/A
Discussion / justification if SD-3 not implemented:			
SD-4 Minimize Soil Compaction	☒ Yes	☐ No	☐ N/A
Discussion / justification if SD-4 not implemented:			
SD-5 Impervious Area Dispersion	☒ Yes	☐ No	☐ N/A
Discussion / justification if SD-5 not implemented:			
SD-6 Runoff Collection	☒ Yes	☐ No	☐ N/A
Discussion / justification if SD-6 not implemented:			
SD-7 Landscaping with Native or Drought Tolerant Species	☒ Yes	☐ No	☐ N/A
Discussion / justification if SD-7 not implemented:			
SD-8 Harvesting and Using Precipitation	☐ Yes	☐ No	☒ N/A
Discussion / justification if SD-8 not implemented:			

Summary of PDP Structural BMPs	Form 4 (PDPs) City of Solana Beach BMP Design Manual
Project Identification	
Project Name: Ida Avenue Apartments	
Permit Application Number: Case No. 17-17-3	
PDP Structural BMPs	
All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the BMP Design Manual). Selection of PDP structural BMPs for storm water pollutant control must be based on the selection process described in Chapter 5. PDPs subject to hydromodification management requirements must also implement structural BMPs for flow control for hydromodification management (see Chapter 6 of the BMP Design Manual). Both storm water pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s). PDP structural BMPs must be verified by the local jurisdiction at the completion of construction. This may include requiring the project owner or project owner's representative and engineer of record to certify construction of the structural BMPs (see Section 1.12 of the BMP Design Manual). PDP structural BMPs must be maintained into perpetuity, and the local jurisdiction must confirm the maintenance (see Section 7 of the BMP Design Manual). Use this form to provide narrative description of the general strategy for structural BMP implementation at the project site in the box below. Then complete the PDP structural BMP summary information sheet (page 3 of this form) for each structural BMP within the project (copy the BMP summary information page as many times as needed to provide summary information for each individual structural BMP).	

Form 4
Describe the general strategy for structural BMP implementation at the site. This information must describe how the steps for selecting and designing storm water pollutant control BMPs presented in Section 5.1 of the BMP Design Manual were followed, and the results (type of BMPs selected). For projects requiring hydromodification flow control BMPs, indicate whether pollutant control and flow control BMPs are integrated or separate. *Drop inlet catch basins and HDPE pipe will be installed to convey flow generated onsite onto Ida Ave. Two 4'x6' Filterra catch basins will be constructed on Ida Ave. to treat the low flows generated onsite. Additional catch basin inlets will be constructed downstream of the Filterras to capture high flows to be stored. The runoff will then be conveyed to ADS perforated underground storage chambers designed to detain the post-development 10-year volumes. These flows will be detained and infiltrated into the ground. For storm flows greater than the 10-year event, flows will be bypassed via an overflow system and continue along Ida Ave. to perpetuate pre-development flow patterns and quantities.* *Due to limited site area from existing slopes, flat areas for treatment basins are not feasible. Due to limited landscaped area compared to the design capture volume, harvest and reuse is not feasible. Filterra catch basins will sufficiently treat pollutants in stormwater and storage chambers will infiltrate underground to perpetuate existing conditions.* *A unit hydrograph model for proposed conditions was created to determine the total volume generated from the 0.94-acre site. The 10-year volume generated from the site was found to be 7,570 CF. This volume will be stored within two separate storage chamber systems distributed between DMA A-2 and B-2.* *Each storage chamber was calculated to store approximately 215.1 CF of stormwater within the tank and the gravel trench surrounding the tank. The total required storage of 7,570 CF will be stored in 36 storage chambers (36 x 215.1 CF = 7,744 CF).* *Using CivilD software, the onsite pre and post conditions were modeled to compare hydrologic conditions at the outlet points. The software showed that the proposed site mitigates and reduces flow rates for the 10 year storms. The 10-year storm is reduced from 0.8 CFS to 0.2 CFS.* *The design capture volume (DCV) was calculated to be 1,532 CF per the City of Solana Beach BMP Design Manual Appendix B.1. However, Filterra catch basins are sized per the manufacturer-recommended sizing table, which is based on the site area. The area being treated by both Filterras is 1.2 acres (0.87 on-site and 0.33 acres from the street), so 4'x6' Filterra catch basins will be installed to treat approximately 0.6-acres each.*

Form 4 (Copy as many as needed)
Structural BMP Summary Information **(Copy this page as needed to provide information for each individual proposed structural BMP)**
Structural BMP ID No. 1 , 2
Construction Plan Sheet No. CGP-02
Type of structural BMP: ☐ Retention by harvest and use (HU-1) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☐ Retention by permeable pavement (INF-3) ☐ Partial retention by biofiltration with partial retention (PR-1) ☐ Biofiltration (BF-1) ☐ Biofiltration with Nutrient Sensitive Media Design (BF-2) ☒ Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F ☐ Flow-through treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐ Flow-through treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☒ Detention pond or vault for hydromodification management ☐ Other (describe in discussion section below)
Purpose: ☐ Pollutant control only ☐ Hydromodification control only ☒ Combined pollutant control and hydromodification control ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)

Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms if required by the City Engineer (See Section 1.12 of the BMP Design Manual).	KNN Management, LLC 1280 Hoover Street Carlsbad, CA 92008 Phone Number: (790) 214-8558 Email: shantumd@gmail.com Contact: Shantu Patel
Who will be the final owner of this BMP?	Shantu Patel
Who will maintain this BMP into perpetuity?	Shantu Patel
What is the funding mechanism for maintenance?	Shantu Patel
Structural BMP ID No. 1, 2	
Construction Plan Sheet No. CGP-02	
Discussion (as needed): *Two 4'X6' Filterra Catch Basins will be installed.* *Two sets of ADS stormwater chambers will be installed. 36 chambers total will be installed for a storage volume of approximately 7,744 CF.*	

<table>
<tr><td colspan="2">Harvest and Use Feasibility Checklist</td><td>Form 5 (PDPs)
City of Solana Beach BMP Design Manual</td></tr>
<tr><td colspan="3">1. Is there a demand for harvested water (check all that apply) at the project site that is reliably present during the wet season?
☒ Toilet and urinal flushing
☒ Landscape irrigation
☐ Other:_____</td></tr>
<tr><td colspan="3">2. If there is a demand; estimate the anticipated average wet season demand over a period of 36 hours. Guidance for planning level demand calculations for toilet/urinal flushing and landscape irrigation is provided in Section B.3.2.
35 CF</td></tr>
<tr><td colspan="3">3. Calculate the DCV using worksheet B-2.1.
DCV = 1,532 (cubic feet)</td></tr>
<tr><td>3a. Is the 36 hour demand greater than or equal to the DCV?
☐ Yes / ☒ No ➡
⇩</td><td>3b. Is the 36 hour demand greater than 0.25DCV but less than the full DCV?
☐ Yes / ☒ No ➡
⇩</td><td>3c. Is the 36 hour demand less than 0.25DCV?
☒ Yes
⇩</td></tr>
<tr><td>Harvest and use appears to be feasible. Conduct more detailed evaluation and sizing calculations to confirm that DCV can be used at an adequate rate to meet drawdown criteria.</td><td>Harvest and use may be feasible. Conduct more detailed evaluation and sizing calculations to determine feasibility. Harvest and use may only be able to be used for a portion of the site, or (optionally) the storage may need to be upsized to meet long term capture targets while draining in longer than 36 hours.</td><td>Harvest and use is considered to be infeasible.</td></tr>
<tr><td colspan="3">Is harvest and use feasible based on further evaluation?
☐ Yes, refer to Appendix E to select and size harvest and use BMPs.
☒ No, select alternate BMPs.</td></tr>
</table>

Categorization of Infiltration Feasibility Condition	Form 6 (PDPs) City of Solana Beach BMP Design Manual

Part 1 - Full Infiltration Feasibility Screening Criteria

Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?

Criteri	Screening Question	Yes	No
1	**Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.	X	

Provide basis:

USGS maps show that the site is under laid with hydrologic soils Group A and Group B soils and the geotechnical report notes that the majority of soils found were silty sand.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

2	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.	X	

Provide basis:

The site geotechnical report does not preclude the use of infiltration.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

Form 6			
Criteria	Screening Question	**Yes**	**No**
3	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: Groundwater was not found in borings. The site geotechnical report does not preclude the use of infiltration. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
4	**Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: The site geotechnical report does not preclude the use of infiltration. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
Part 1 Result *	If all answers to rows 1 - 4 are "**Yes**" a full infiltration design is potentially feasible. The feasibility screening category is **Full Infiltration** If any answer from row 1-4 is "**No**", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design. Proceed to Part 2	Full Infiltration	

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by Agency/Jurisdictions to substantiate findings

Form 6

Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria

Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
5	**Do soil and geologic conditions allow for infiltration in any appreciable rate or volume?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		

Provide basis:

N/A

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

6	**Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level**? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		

Provide basis:

N/A

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

Form 6			
Criteria	Screening Question	**Yes**	**No**
7	**Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: N/A Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
8	**Can infiltration be allowed without violating downstream water rights**? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: N/A Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
Part 2 Result*	If all answers from row 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is **Partial Infiltration.** If any answer from row 5-8 is no, then infiltration of any volume is considered to be **infeasible** within the drainage area. The feasibility screening category is **No Infiltration.**		

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by Agency/Jurisdictions to substantiate findings

Factor of Safety and Design Infiltration Rate Worksheet					Form 7 (PDPs) City of Solana Beach BMP Design Manual
Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	3	0.75
		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, $S_A = \Sigma p$			1.5
B	Design	Level of pretreatment/ expected sediment loads	0.5	3	1.5
		Redundancy/resiliency	0.25	2	0.5
		Compaction during construction	0.25	2	0.5
		Design Safety Factor, $S_B = \Sigma p$			2.5
Combined Safety Factor, $S_{total} = S_A \times S_B$				3.75	
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)				6	
Design Infiltration Rate, in/hr, $K_{design} = K_{observed} / S_{total}$				1.6	
Supporting Data					
Briefly describe infiltration test and provide reference to test forms: Record maps were used to estimate infiltration rate.					

Downstream Systems Requirements for Preservation of Coarse Sediment Supply		Form 8 (PDPs) City of Solana Beach BMP Design Manual	
When it has been determined that potential critical coarse sediment yield areas exist within the project site, the next step is to determine whether downstream systems would be sensitive to reduction of coarse sediment yield from the project site. Use this form to document the evaluation of downstream systems requirements for preservation of coarse sediment supply.			
Project Name: Ida Avenue Apartments			
Project Tracking Number / Permit Application Number: Case No. 17-17-3			
1	Will the project discharge runoff to a hardened MS4 system (pipe or lined channel) or an un-lined channel?	☒ Hardened MS4 system	Go to 2
		☐ Un-lined channel	Go to 4
2	Will the hardened MS4 system convey sediment (e.g., a concrete-lined channel with steep slope and cleansing velocity) or sink sediment (e.g., flat slopes, constrictions, treatment BMPs, or ponds with restricted outlets within the system will trap sediment and not allow conveyance of coarse sediment from the project site to an un-lined system).	☒ Convey	Go to 3
		☐ Sink	Go to 7
3	What kind of receiving water will the hardened MS4 system convey the sediment to?	☒ Un-lined channel	Go to 4
		☐ Lake ☐ Reservoir ☐ Bay	Go to 7
		☐ Lagoon ☐ Ocean	Go to 6
4	Is the un-lined channel impacted by deposition of sediment? This condition must be documented by the local agency.	☐ Yes	Go to 7
		☒ No	Go to 5

Form 8	
5	End – Preserve coarse sediment supply to protect un-lined channels from accelerated erosion due to reduction of coarse sediment yield from the project site unless further investigation determines the sediment is not critical to the receiving stream. Sediment that is critical to receiving streams is the sediment that is a significant source of bed material to the receiving stream (bed sediment supply) (see Section 6.2.3 and Appendix H.2 of the manual).
6	End – Provide management measures for preservation of coarse sediment supply (protect beach sand supply).
7	End – Downstream system does not warrant preservation of coarse sediment supply, no measures for protection of critical coarse sediment yield areas onsite are necessary. Use the space below to describe the basis for this finding for the project.

ATTACHMENT 1
BACKUP FOR PDP POLLUTANT CONTROL BMPS

This is the cover sheet for Attachment 1.

Indicate which Items are Included behind this cover sheet:

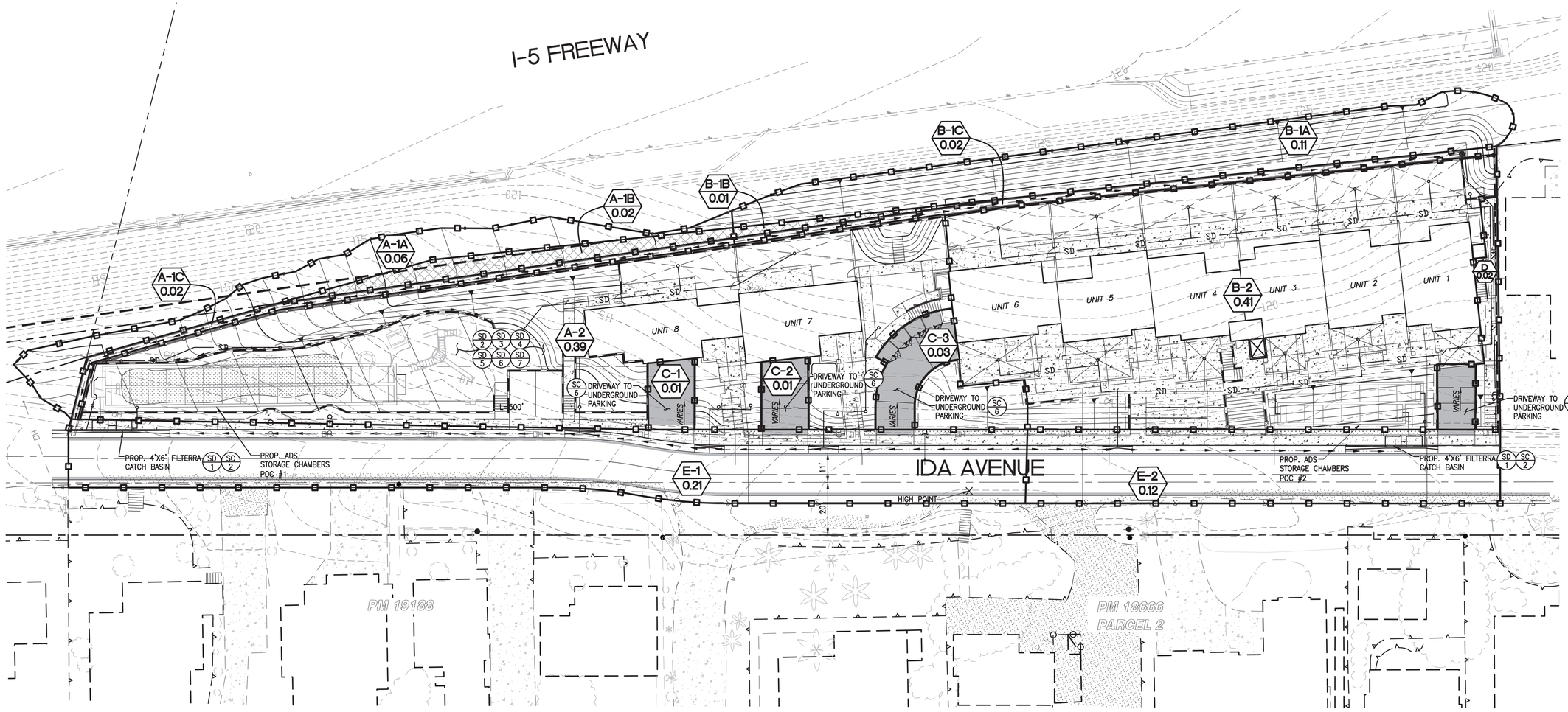
Attachment Sequence	**Contents**	**Checklist**
Attachment 1a	DMA Exhibit (Required) See DMA Exhibit Checklist on the back of this Attachment cover sheet.	☒ Included
Attachment 1b	Tabular Summary of DMAs Showing DMA ID matching DMA Exhibit, DMA Area, and DMA Type (Required)* *Provide table in this Attachment OR on DMA Exhibit in Attachment 1.a	☒ Included on DMA Exhibit in Attachment 1.a ☐ Included as Attachment 1.b, separate from DMA Exhibit
Attachment 1c	Form 5, Harvest and Use Feasibility Screening Checklist (Required unless the entire project will use infiltration BMPs) Refer to Appendix B.3-1 of the BMP Design Manual to complete Form 5.	☒ Included ☐ Not included because the entire project will use infiltration BMPs
Attachment 1d	Form 6, Categorization of Infiltration Feasibility Condition (Required unless the project will use harvest and use BMPs) Refer to Appendices C and D of the BMP Design Manual to complete Form 6.	☒ Included ☐ Not included because the entire project will use harvest and use BMPs
Attachment 1e	Pollutant Control BMP Design Worksheets / Calculations (Required) Refer to Appendices B and E of the BMP Design Manual for structural pollutant control BMP design guidelines	☒ Included

Use this checklist to ensure the required information has been included on the DMA Exhibit:

The DMA Exhibit must identify:

- ☒ Underlying hydrologic soil group
- ☒ Approximate depth to groundwater
- ☒ Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
- ☒ Critical coarse sediment yield areas to be protected
- ☒ Existing topography and impervious areas
- ☒ Existing and proposed site drainage network and connections to drainage offsite
- ☒ Proposed demolition
- ☒ Proposed grading
- ☒ Proposed impervious features
- ☒ Proposed design features and surface treatments used to minimize imperviousness
- ☒ Drainage management area (DMA) boundaries, DMA ID numbers, and DMA areas (square footage or acreage), and DMA type (i.e., drains to BMP, self-retaining, or self-mitigating)
- ☒ Potential pollutant source areas and corresponding required source controls (see Chapter 4, Appendix E.1, and Form 1)
- ☒ Structural BMPs (identify location, type of BMP, and size/detail)

WQTR / HYDROMODIFICATION EXHIBIT

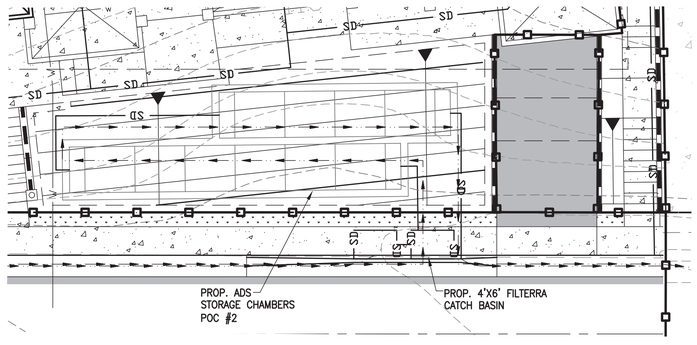


BMP's FOR SOURCE CONTROLS	
NUMBER	DESCRIPTION
SC-1	PREVENTION OF ILLICIT DISCHARGES INTO THE MS4
SC-2	STORM DRAIN STENCILING OR SIGNAGE
SC-3	PROTECT OUTDOOR MATERIALS STORAGE AREAS FROM RAINFALL, RUN-ON, RUNOFF, AND WIND DISPERSAL
SC-4	PROTECT MATERIALS STORED IN OUTDOOR WORK AREAS FROM RAINFALL, RUN-ON, RUNOFF, AND WIND DISPERSAL
SC-5	PROTECT TRASH STORAGE AREAS FROM RAINFALL, RUN-ON, RUNOFF, AND WIND DISPERSAL
SC-6	ADDITIONAL BMP'S BASED ON POTENTIAL SOURCES OF RUNOFF POLLUTANTS
SD-1	NATURAL DRAINAGE/HYDROLOGIC MAINTENANCE
SD-2	CONSERVE NATURAL AREAS, SOILS & VEGETATION
SD-3	MINIMIZE IMPERVIOUS AREA
SD-4	MINIMIZE SOIL COMPACTION
SD-5	IMPERVIOUS AREA DISPERSION
SD-6	RUNOFF COLLECTION
SD-7	LANDSCAPING WITH NATIVE OR DROUGHT TOLERANT SPECIES
SD-8	HARVESTING & USING PRECIPITATION

N

20 0 20 40

SCALE 1" = 20'



□□□□ □□□□□□

□"□□□□

□□□□

GROUNDWATER NOT ENCOUNTERED IN BORINGS

EXISTING CONDITIONS

DMA	SITE	A-1	B-1
AREA (SF)	61088	35458	25630
AREA (AC)	1.40	0.81	0.59
AREA IMP (SF)	0	0	0
AREA PERV (SF)	61088	35458	25630
TC-10 (MIN)	8.16		
Q-10 (CFS)	0.92	0.49	0.43
Q-100 (CFS)	1.43	0.76	0.67
V-10 (CF)	117		

PROPOSED CONDITIONS	TREATMENT AREA	ONSITE						OFFSITE						
DMA	A-2, B-2, C-1, C-2, C-3, E-2, E-3	A-2	B-2	C-1	C-2	C-3	D	A-1A	A-1B	A-1C	B-1A	B-1B	B-1C	E-1
AREA (SF)	51408	17150	17786	460	472	1212	690	2520	917	680	4940	201	833	9302
AREA (AC)	1.2	0.39	0.41	0.01	0.01	0.03	0.02	0.06	0.02	0.02	0.11	0.005	0.02	0.21
AREA IMP (SF)	38776													
AREA PERV (SF)	12632													
C	0.703													
RAINFALL d (IN)	0.5													
DCV (CF)	1532													
Tc-10 (MIN)	8.3													
Q-10 (CFS)	1.6	0.66	0.56	0.02	0.02	0.05		0.20			0.21			0.21
V-10 (CF)	4249													
V-10 SOIL LOSS (CF)	3321													
V-CHAMBERS (CF)	7570													
Q-100 (CFS)	2.53	1.02	0.87	0.03	0.03	0.07		0.31			0.33			0.33

AREA DESIGNATION	DMA	AREA (SF)	AREA (AC)
ONSITE			
	A-2	17150	0.39
	B-2	17786	0.41
	C-1	460	0.01
	C-2	472	0.01
	C-3	1212	0.03
	D	690	0.02
	SUBTOTAL		0.87
CALTRANS TAKE			
	A-1B	917	0.02
	B-1B	201	0.005
	SUBTOTAL		0.03
V-DITCH			
	A-1C	680	0.02
	B-1C	833	0.02
	SUBTOTAL		0.04
	ONSITE TOTAL		**0.94**
OFFSITE			
CALTRANS			
	A-1A	2520	0.06
	B-1A	4940	0.11
	SUBTOTAL		0.17
STREET			
	E-1	9302	0.21
	E-2	5026	0.12
	SUBTOTAL		0.33
	OFFSITE TOTAL		**0.50**
TOTAL DISTURBED AREA			1.44

LEGEND

- DMA BOUNDARY
- FLOWLINE
- PROPERTY LINE
- SD — STORM DRAIN
- EXIST CONTOURS
- X / XX — DRAINAGE MANAGEMENT AREA / ACREAGE
- EXIST. AC
- PROP. AC
- PCC
- PROP. LDSCP (SOILS GROUP A)

WATER QUALITY TECHNICAL REPORT
FOR
IDA AVE. APARTMENTS

PREPARED BY:

ARMSTRONG & BROOKS CONSULTING ENGINEERS
PLANNING · INFRASTRUCTURE · SITE DEVELOPMENT · WATER RESOURCES
1340 EAST CHASE DRIVE CORONA, CA 92882
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I:\JOBS\117\1574 PATEL – SOLANA BEACH\ADMIN\WQTR\EXHIBIT\1574-WQTR EXHIBIT.DWG 7/20/21

filterra
Bioretention Systems
CELEBRATING 10 YEARS
by KRISTAR

Table 1: Filterra® Quick Sizing Table
(Western Zone - 0.2 in/hr Uniform Intensity Approach)

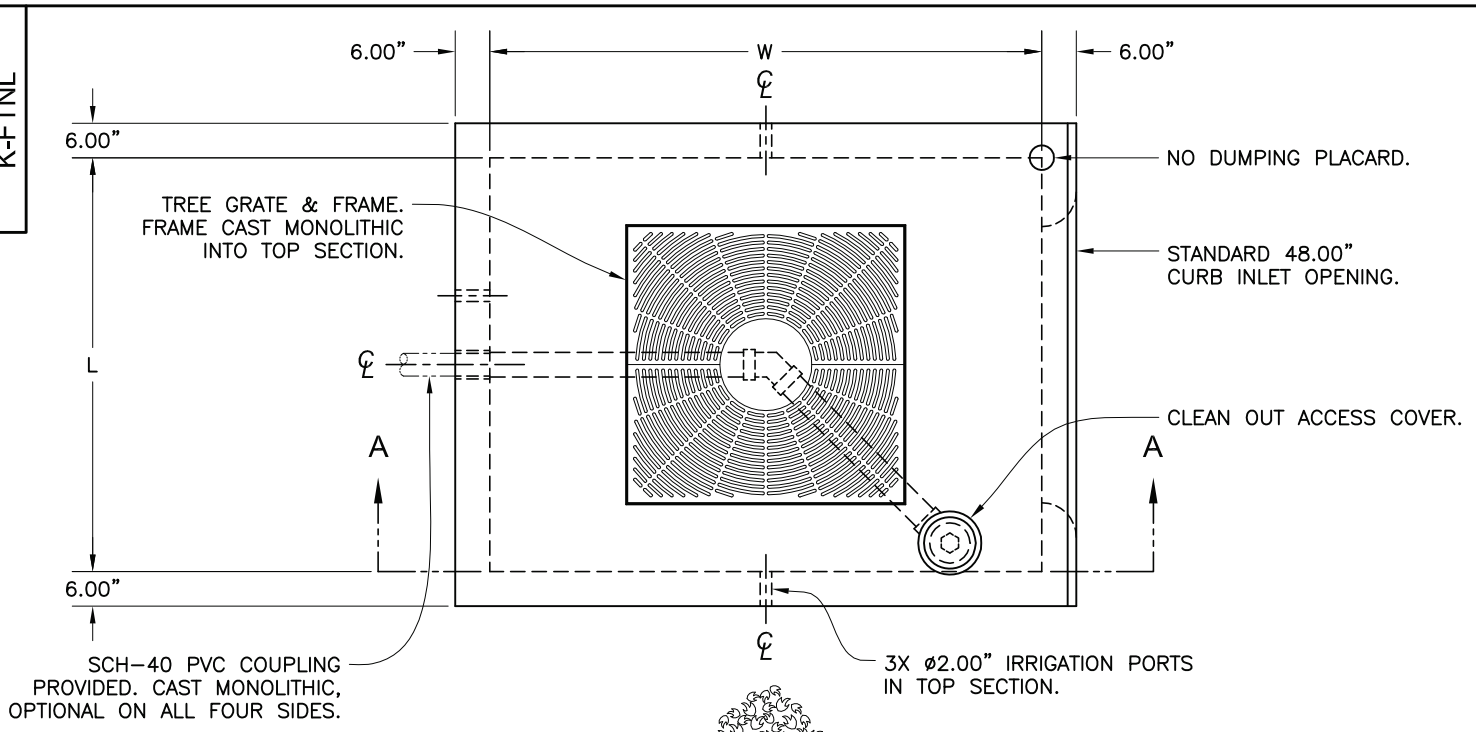
Filterra® Box Sizes (feet)	Recommended Commercial Contributing Drainage Area (acres) where C = 0.85	Outlet Pipe
4x4	up to 0.22	4” SCH-40 PVC
4x6 or 6x4	0.23 to 0.33	4" SCH-40 PVC
4x6.5 or 6.5x4	0.23 to 0.35	4" SCH-40 PVC
4x8 or 8x4	0.34 to 0.44	4” SCH-40 PVC
4x16 or 16x4	up to 0.87	6” SCH-40 PVC
Standard 6x6	0.45 to 0.49	4” SCH-40 PVC
6x8 or 8x6	0.50 to 0.65	4” SCH-40 PVC
6x10 or 10x6	0.66 to 0.82	4” SCH-40 PVC
6x12 or 12x6	0.83 to 0.98	6” SCH-40 PVC
8x12 or 12x8	0.99 to 1.31	6" SCH-40 PVC
8x16 or 16x8	up to 1.75	6” SCH-40 PVC
8x18 or 18x8	up to 1.96	6” SCH-40 PVC
8x20 or 20x8	up to 2.18	6” SCH-40 PVC

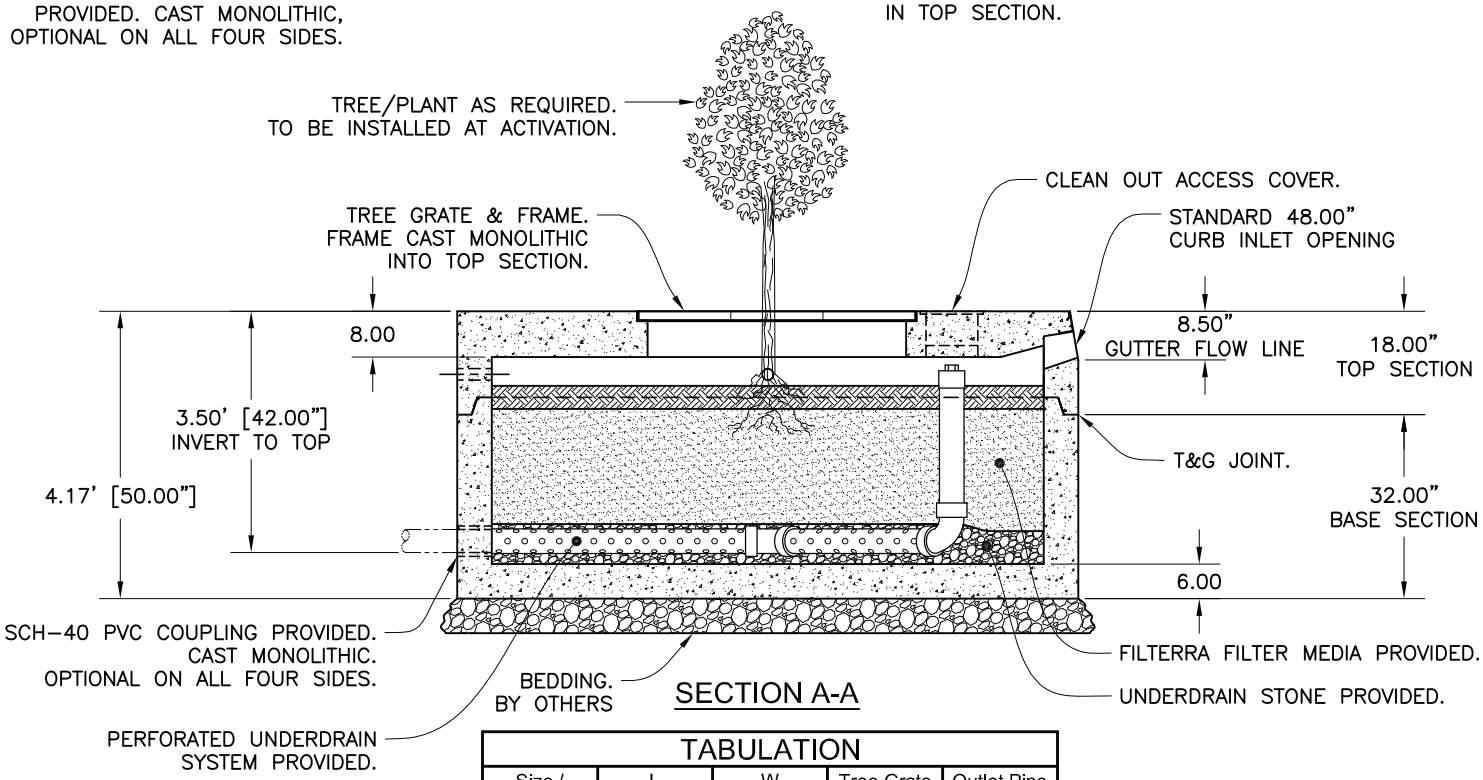
Filterra® Box Sizes (feet)	Recommended Residential Contributing Drainage Area (acres) where C = 0.50	Outlet Pipe
4x4	up to 0.37	4” SCH-40 PVC
4x6 or 6x4	0.38 to 0.60	4" SCH-40 PVC
4x6.5 or 6.5x4	0.38 to 0.60	4" SCH-40 PVC
4x8 or 8x4	0.61 to 0.74	4” SCH-40 PVC
4x16 or 16x4	up to 1.48	6” SCH-40 PVC
Standard 6x6	0.75 to 0.83	4” SCH-40 PVC
6x8 or 8x6	0.84 to 1.11	4” SCH-40 PVC
6x10 or 10x6	1.12 to 1.39	6” SCH-40 PVC
6x12 or 12x6	1.40 to 1.67	6” SCH-40 PVC
8x12 or 12x8	1.68 to 2.22	6" SCH-40 PVC
8x16 or 16x8	up to 2.97	6” SCH-40 PVC
8x18 or 18x8	up to 3.34	6” SCH-40 PVC
8x20 or 20x8	up to 3.71	6” SCH-40 PVC

Notes:

1. Additional Filterra Box sizes are available by contacting KriStar.
2. All boxes are standard 3.5 feet depth (INV to TC).
3. A standard PVC pipe coupling is cast into the wall for easy connection to discgarge drain.
4. Dimensions shown are internal. Please add 1’ to the internal dimensions to obtain the external dimensions (using 6" walls).
5. In line with TR55 data, for Commerical Developments a minimum (runoff coefficient) C factor of 0.85 is recommended. For Residential Developments, use of C factors less than 0.5 require individual site review by KriStar.
6. Please ask for Sizing Tables for other target treatment goals, e.g. 0.3 in/hr.
7. This sizing table is valid for CA, NV, AZ, CO, UT, NM. For the state of HI, please contact a Filterra® representative.

K-FTNL





SECTION A-A

TABULATION				
Size / Designation	L (Feet)	W (Feet)	Tree Grate Quantity / Size	Outlet Pipe PVC SCH-40
4' X 6'	4.00'	6.00'	1ea. / 3' x 3'	Ø4.00"
4' x 6.5'	4.00'	6.50'	1ea. / 3' x 3'	Ø4.00"
4' x 8'	4.00'	8.00'	1ea. / 3' x 3'	Ø4.00"
4' x 16'	4.00'	16.00'	2ea. / 3' x 3'	Ø4.00"
6' x 8'	6.00'	8.00'	1ea. / 4' x 4'	Ø4.00"
6' x 10'	6.00'	10.00'	1ea. / 4' x 4'	Ø6.00"
6' x 12'	6.00'	12.00'	2ea. / 4' x 4'	Ø6.00"
8' x 12'	8.00'	12.00'	2ea. / 4' x 4'	Ø6.00"
8' x 16'	8.00'	16.00'	2ea. / 4' x 4'	Ø6.00"
8' x 18'	8.00'	18.00'	3ea. / 4' x 4'	Ø6.00"
8' x 20'	8.00'	20.00'	3ea. / 4' x 4'	Ø6.00"

MODIFICATION OF DRAWINGS IS PERMITTED ONLY BY WRITTEN AUTHORIZATION FROM KRISTAR ENTERPRISES, INC.

TITLE

Precast Filterra® Unit
Narrow Length Configuration

KriStar Enterprises, Inc.
360 Sutton Place, Santa Rosa, CA 95407
Ph: 800.579.8819, Fax: 707.524.8186, www.kristar.com

filterra®
US PAT 6,277,274
AND 6,569,321

DRAWING NO.	REV	F-ECO	DATE
K-FTNL	03	0006 JPR 6/17/11	JPR 1/7/11



filterra®
Bioretention Systems

Filterra® Stormwater Bioretention Filtration System

The Urban Solution for LID

Standard Filterra® System

The Standard Filterra® System is similar in concept to bioretention in its function and applications but has been optimized for high volume/flow treatment and high pollutant removal. Its small footprint allows it to be used on highly developed sites such as landscaped areas, parking lots and streetscapes. Filterra® is exceedingly adaptable and can be used alone or in combination with other BMPs.

Stormwater runoff enters the Standard Filterra System through a curb-inlet opening and flows through a specially designed filter media mixture contained in a landscaped concrete container. The filter media captures and immobilizes pollutants; those pollutants are then decomposed, volatilized and incorporated into the biomass of the Filterra® system's micro/macro fauna and flora. Stormwater runoff flows through the media and into an underdrain system at the bottom of the container, where the treated water is discharged.

Features and Benefits

Best Value. Filterra offers the most cost effective stormwater treatment system featuring low cost, easy installation and simple maintenance.

Regulatory Compliance. Third party field testing confirmed that Filterra meets state regulatory requirements for pollutant removal under TAPE and TARP testing.

Aesthetics. Landscaping enhances the appearance of your site making it more attractive while removing pollutants.

Maintenance. Maintenance is simple and safe (no confined space access), and the first year is FREE with the purchase of every unit.

Versatile. Filterra is ideal for both new construction and urban retrofits, as well as:

- **Streetscapes**
- **Parking lots**
- **Highways**
- **Urban settings**
- **Daylighted Roof drains**
- **Industrial settings**

Design Support. Our engineers can assist you with all aspects of each Filterra application, including flora selection and sizing.[1]

Printed on FSC certified paper.

A Highly Effective System

Filterra is well-suited for the ultra-urban environment with proven high removal efficiency for many toxic substances such as petroleum and heavy metals.



Filterra® monitoring unit at an industrial port.

The Filterra System meets or exceeds federal and state regulatory guidelines for pollutant removal efficiencies of Total Suspended Solids (TSS), nutrients and metals.

Expected Pollutant Removal

(Ranges Varying with Particle Size, Pollutant Loading and Site Conditions)

TSS Removal	85%
Phosphorus Removal	60% - 70%
Nitrogen Removal	43%
Total Copper Removal	> 58%
Dissolved Copper Removal	46%
Total Zinc Removal	> 66%
Dissolved Zinc Removal	58%
Oil & Grease	> 93%

Information on the pollutant removal efficiency of the filter soil/plant media is based on third party lab and field studies.

[1] For more details, see the Sizing Table for your project's region.



Maintenance is simple and safe.

filterra®
Bioretention Systems

Filterra® Stormwater Bioretention Filtration System

The Urban Solution for LID

Design Assistance

Visit www.filterra.com to receive your Filterra DAKit (Design Assistance Kit). This includes placement "Do's and Don'ts", example scenarios, detail drawings, specifications, project information form, and other essential design information.

Sizing Procedure

1) Use your project's Regional Filterra DAKit as a reference.

2) Determine Filterra locations (with effective bypass) in accordance with placement guidelines.

3) Determine contributing drainage areas to each Filterra.

4) Choose the corresponding size Filterra from the project's Regional Sizing Table.

5) For best results, get us involved early in the design process. Please send your completed project information form along with plans to Filterra for placement and application review.



Proper Placement

1) Do not place in a sump condition. The Standard Filterra cannot be used as a standalone inlet - it will need effective bypass during higher intensity rainfall events.

2) Do not direct surface flow to Filterra in a "head on" configuration. The ideal way to load Filterra to prevent system damage is a cross linear flow (left-to-right or right-to-left) in the gutter in front of the Filterra. This prevents the re-suspension and possible exit of the trapped pollutants, mulch, and engineered media from within Filterra during the high flow bypass stage.

3) Refer to example scenarios in the Filterra DAKit

Standard Filterra Placement Example



Standard Filterra System showing curb-inlet opening.

Placement Review

Because we want your project with Filterra to be a great success, we respectfully require that each Filterra project be reviewed by our placement/design staff. This review is mandatory, as proper placement ensures you of the most efficient and cost effective solution, as well as optimum performance and minimal maintenance.

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Filterra® is protected by U.S. Patents #6,277,274, #6,569,321 & #7,625,485. Other patents pending.
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Table C-1 presents the beneficial use designations of the 303(d) listed waterbodies in the San Dieguito River WMA. Beneficial uses specifically identified as impaired by the 2010 303(d) list are shaded blue. This table does not present waterbodies that were not identified as impaired on the 303(d) list. Approximately 97% of the waterbodies in the San Dieguito River WMA are not impaired or have not been assessed. Of those waterbodies that are listed as having impairments, most beneficial uses are attained.

Table C-1
Beneficial Uses of the 2010 303(d) Listed Waterbodies in the San Dieguito River WMA

303(d) Listed Waterbody Name	Beneficial Use																			
	IND	NAV	COMM	MUN	AGR	IND	PROC	GWR	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	MAR	AQUA	MIGR	SPWN	SHELL
Santa Ysabel Creek (905.53 and 905.54)				●	●	●	●		●	●		●	●	●					●	
Sutherland Reservoir (905.53)				●	●	●	●		●	●		●	●	●	●					
Cloverdale Creek (905.32)				●	●	●	●		○	●		●		●	●					
Kit Carson Creek (905.21)				●	●	●	●	○	●	●		●		●	●					
Green Valley Creek (905.21 and 905.22)				●	●	●	●	○	●	●		●		●						
Felicita Creek (905.23)				●	●	●	●	○	●	●		●		●						
Lake Hodges (905.21)				●	●	●	●		●	●		●	●	●	●					
San Dieguito River (905.11 and 905.21)				●	●	●	●		●	●	●	●	●	●	●				●	
Pacific Ocean Shoreline at San Dieguito Lagoon Mouth (905.11)	●	●	●						●	●	●			●	●	●	●	●	●	●

Beneficial use is impaired based on the 2010 303(d) list

○ Potential beneficial use
● Existing beneficial use

The beneficial uses that are impaired in 303(d)-listed waterbodies the San Dieguito River WMA are defined in the Basin Plan as follows:

- **AGR (Agricultural Supply)** includes uses of water for farming, horticulture, or ranching, including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.
- **MUN (Municipal and Domestic Supply)** includes uses of water for community, military, or individual water supply systems, including, but not limited to, drinking water supply.

- **REC-1 (Contact Water Recreation)** includes uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and SCUBA diving, surfing, white water activities, fishing, or use of natural hot springs.
- **REC-2 (Non-Contact Water Recreation)** includes the uses of water for recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tide pool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.
- **SHELL (Shellfish Harvesting)** includes uses of water that support habitats suitable for the collection of filter-feeding shellfish (e.g., clams, oysters, and mussels) for human consumption, commercial, or sport purposes.
- **WARM (Warm Freshwater Habitat)** includes uses of water that support warm water ecosystems, including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

The beneficial uses in the San Dieguito WMA which are not impaired are defined in the Basin Plan as follows:

- **AQUA (Aquaculture)** includes the uses of water for aquaculture or mariculture operations including, but not limited to, propagation, cultivation, maintenance, or harvesting of aquatic plants and animals for human consumption or bait purposes.
- **BIOL** (**Preservation of Biological Habitats of Special Significance)** includes uses of water that support designated areas or habitats, such as established refuges, parks, sanctuaries, ecological reserves, or Areas of Special Biological Significance (ASBS), where the preservation or enhancement of natural resources requires special protection.
- **COLD (Cold Freshwater Habitat)** includes uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish or wildlife, including invertebrates.
- **COMM** (**Commercial and Sport Fishing)** includes the uses of water for commercial or recreational collection of fish, shellfish, or other organisms including, but not limited to, uses involving organisms intended for human consumption or bait purposes.
- **GWR** (**Ground Water Recharge)** includes uses of water for natural or artificial recharge of ground water for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.
- **IND** (**Industrial Service Supply)** includes uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining,

cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well re-pressurization.

- **MAR (Marine Habitat)** includes uses of water that support marine ecosystems including, but not limited to, preservation or enhancement of marine habitats, vegetation such as kelp, fish, shellfish, or wildlife (e.g., marine mammals, shorebirds).

- **MIGR** (**Migration of Aquatic Organisms)** includes uses of water that support habitats necessary for migration, acclimatization between fresh and salt water, or other temporary activities by aquatic organisms, such as anadromous fish.

- **NAV (Navigation)** includes uses of water for shipping, travel, or other transportation by private, military, or commercial vessels.

- **PROC (Industrial Process Supply)** includes uses of water for industrial activities that depend primarily on water quality.

- **RARE (Rare, Threatened, or Endangered Species)** includes uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened, or endangered.

- **SPWN (Spawning, Reproduction, and/or Early Development)** includes uses of water that support high quality habitats suitable for reproduction, early development and sustenance of marine fish and/or cold freshwater fish.

- **WILD (Wildlife Habitat)** includes uses of water that support terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

Document:
City of San Diego San Dieguito Bacteria and Nutrients TMDL- Watershed Characterization Study prepared by AMEC, 2011

Locations within watershed:
San Dieguito River south of Lake Hodges, Green Valley Creek, Boden Creek
Conditions:

Table 1-1: Water Bodies on the 2010 State Board Section §303(d) List in San Dieguito River Watershed

Water Body Name	HSA	HSA No.	Constituent
Pacific Ocean Shoreline at San Dieguito Lagoon Mouth	Rancho Santa Fe	905.11	Indicator bacteria
San Dieguito River	Rancho Santa Fe	905.11	Enterococci, fecal coliform, nitrogen, phosphorus, TDS, and toxicity
Green Valley Creek	Del Dios	905.21	Sulfates, chloride, manganese, and pentachlorophenol (PCP)
Lake Hodges	Del Dios	905.21	Color, nitrogen, phosphorus, turbidity, manganese, mercury and pH
Kit Carson Creek	Del Dios	905.21	Total dissolved solids (TDS) and PCP
Felicita Creek	Felicita	905.23	TDS and aluminum
Cloverdale Creek	Highland	905.32	Phosphorus and TDS
Sutherland Reservoir	Sutherland	905.53	Color, manganese, iron, pH and total nitrogen
Santa Ysabel Creek	Sutherland	905.53	Toxicity

HSA = Hydrologic Sub Area
TDS = Total dissolved solids
PCP = Pentachlorophenal
Source: SWRCB, 2010.

Dry weather:
Generally, analytical results were below WQOs. Constituents that exceeded WQOs during dry weather include chloride, sulfate, TDS, total nitrogen, total phosphorus, turbidity, total metals (aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, iron, manganese, nickel, selenium, and thallium), enterococci, and fecal coliform. Calculated event mean concentration (EMC) results varied across most sites and parameters; however, total metals and total nitrogen were above WQOs at all sites for dry weather events. These results suggest constituent concentrations remained elevated throughout the dry season at all sites.

Wet weather:
Constituents that exceeded water quality objectives during wet weather include nitrite, TDS, total nitrogen, total phosphorus, turbidity, total metals (arsenic, cadmium, chromium, nickel and selenium), enterococci, fecal coliform and total coliform. Calculated EMC results varied across

most sites and parameters; however, total nitrogen, total phosphorus, and total metals were above WQOs at all sites for both wet weather events. This suggests those constituent concentrations remained elevated throughout the storm hydrographs at all sites. Indicator bacteria were above the WQOs at both the mixed land use site, LC-1 (MIXED), and the urbanized site, SDC-TWAS-1 (URBAN). However, indicator bacteria was within the WQO at the reference site, BC-1(REF) during Wet Weather 1, indicating during wet weather, land use may potentially influence bacteria concentrations.

Sources:
Urbanization

Strategies:
• Verify land use characterization
• Characterize how pollutants vary between wet and dry season.
• Bioassessment.

Document:
San Dieguito Watershed Management Plan, input from Consultation Committee

Locations within watershed:
Not specified.

Conditions:
The priority conditions were identified as:
• Nutrients/eutrophication/oxygen depletion
• Silt and Sediment
•Toxicity
• Pathogens in water
• Salinity and dissolved solids
• Litter/trash/debris

Sources:
The priority sources were identified as:
• Increased Development, which could result in an increase in urban stormwater discharges which could contribute nutrients, suspended solids, bacteria, metals, and organics.
• Agricultural and Turf Related Activities which could contribute sediments, nutrients, pesticides, and bacteria

Strategies:
The WMP identifies 6 main programmatic elements in addition to the municipal requirements:
• Reduce hardscape
• Reduce ongoing discharge impairments
• Actions to evaluate and implement land-use BMPs
• Actions to reduce erosion
• Actions to reduce litter
• Education

Document:
City of San Diego Strategic Plan for Watershed Activity Implementation, input from Consultation Committee

Locations within watershed:
Not specified.

Conditions:
The priority conditions were identified as:
• Bacteria
• Nutrients
• Total Dissolved Solids

Sources:
Potential Sources include:
• Eating and Drinking Establishments
• Residential Areas and Activities
• Commercial Landscaping
• Animal Related Facilities
• Golf Courses, Parks, and Recreational Activities
• Municipal Facilities and Activities
• Auto Related Facilities
• Roads, Streets, Highways, and Parking Facilities
• Construction Activities

Strategies:
No data (Strategies identified through 2011 only)

Document:
City of San Diego Public Utilities Department Lake Hodges Watershed Monitoring Data, 2013

Locations within watershed:
The following creeks above Sutherland reservoir
• Bloomdale Creek
• Witch Creek
The following creeks above Lake Hodges
• Temescal Creek
• Sycamore Creek
• Kit Carson Creek
• Del Dios Creek
• Felicita Creek
• Green Valley Creek
• Moonsong Creek
• Santa Maria Creek
• Guejito Creek
• Santa Ysabel Creek
• Cloverdale Creek

Conditions:
No Data

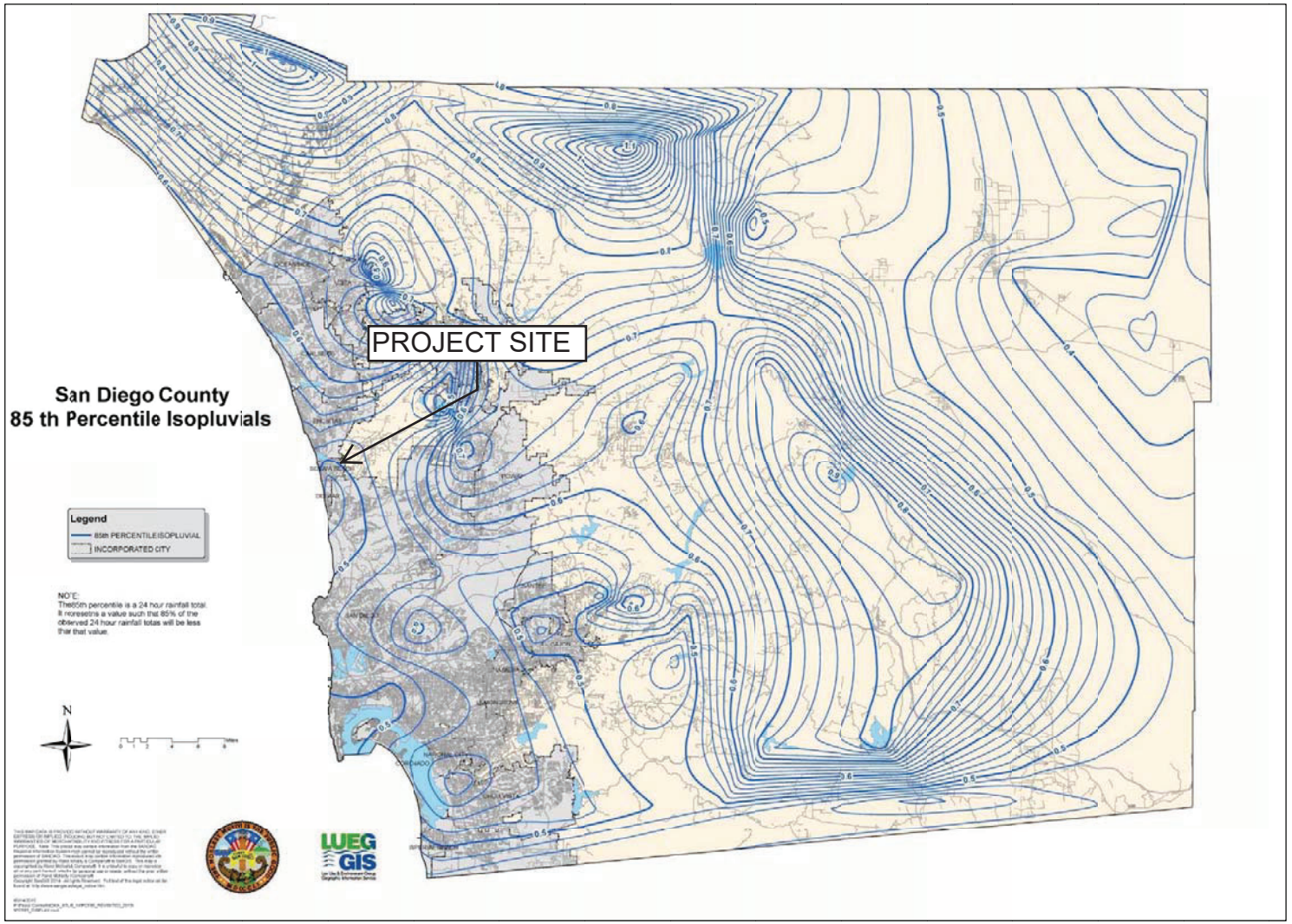
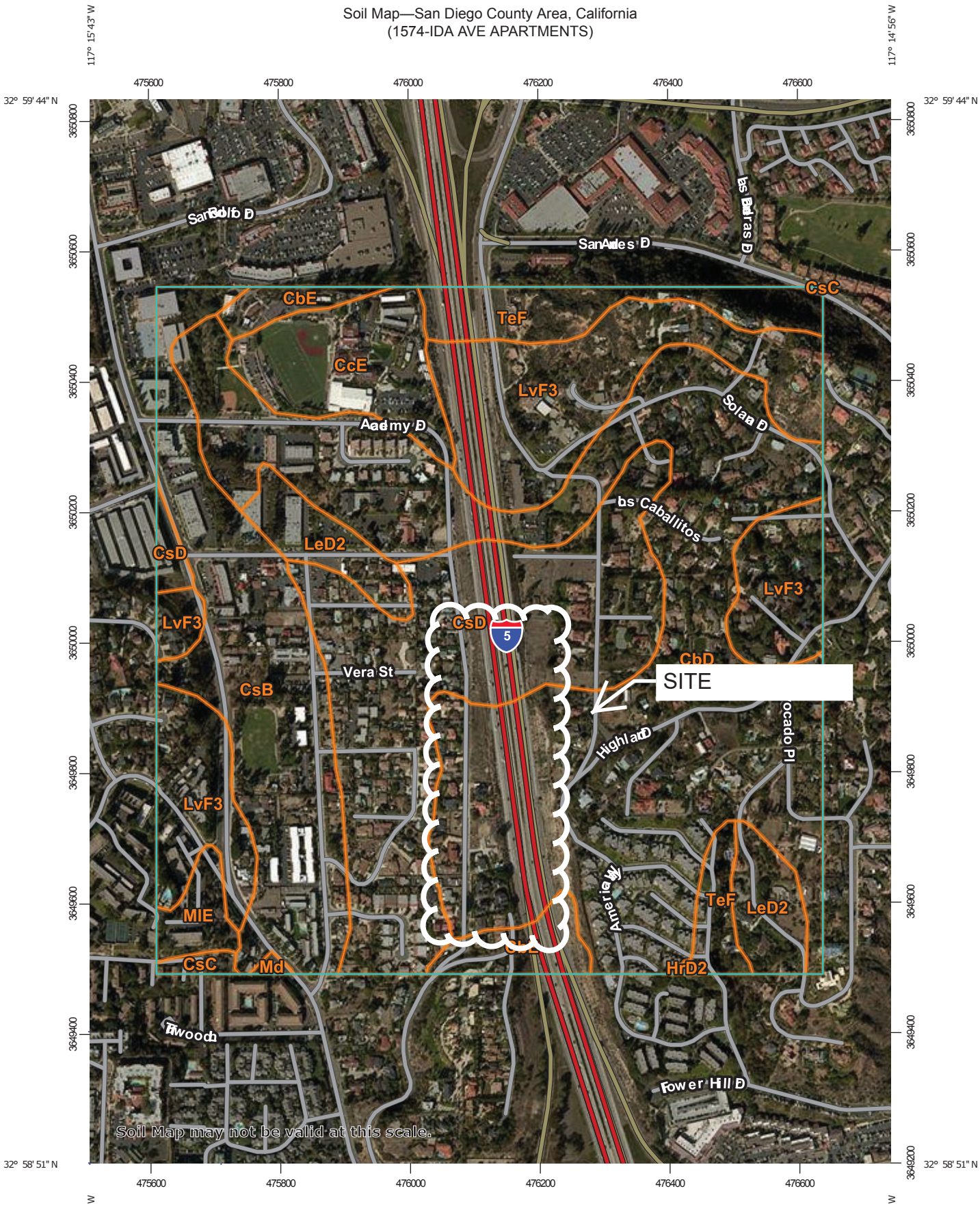


Figure B.1-1: 85th Percentile 24-hour Isopluvial Map

Soil Map—San Diego County Area, California
(1574-IDA AVE APARTMENTS)



Map Scale: 1:7,960 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 350 700 1400 2100

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Diego County Area, California
Survey Area Data: Version 12, Sep 13, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 3, 2014—Nov 22, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CbD	Carlsbad gravelly loamy sand, 9 to 15 percent slopes	97.1	36.2%
CbE	Carlsbad gravelly loamy sand, 15 to 30 percent slopes	6.8	2.5%
CcE	Carlsbad-Urban land complex, 9 to 30 percent slopes	13.0	4.9%
CsB	Corralitos loamy sand, 0 to 5 percent slopes	34.5	12.9%
CsC	Corralitos loamy sand, 5 to 9 percent slopes	0.9	0.3%
CsD	Corralitos loamy sand, 9 to 15 percent slopes	47.2	17.6%
HrD2	Huerhuero loam, 9 to 15 percent slopes, eroded	0.1	0.0%
LeD2	Las Flores loamy fine sand, 9 to 15 percent slopes, eroded	10.6	3.9%
LvF3	Loamy alluvial land-Huerhuero complex, 9 to 50 percent slopes, severely eroded	42.2	15.7%
Md	Made land	0.3	0.1%
MIE	Marina loamy coarse sand, 9 to 30 percent slopes	3.3	1.2%
TeF	Terrace escarpments	12.4	4.6%
Totals for Area of Interest		**268.4**	**100.0%**

Engineering Properties

This table gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

Hydrologic soil group is a group of soils having similar runoff potential under similar storm and cover conditions. The criteria for determining Hydrologic soil group is found in the National Engineering Handbook, Chapter 7 issued May 2007(http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba). Listing HSGs by soil map unit component and not by soil series is a new concept for the engineers. Past engineering references contained lists of HSGs by soil series. Soil series are continually being defined and redefined, and the list of soil series names changes so frequently as to make the task of maintaining a single national list virtually impossible. Therefore, the criteria is now used to calculate the HSG using the component soil properties and no such national series lists will be maintained. All such references are obsolete and their use should be discontinued. Soil properties that influence runoff potential are those that influence the minimum rate of infiltration for a bare soil after prolonged wetting and when not frozen. These properties are depth to a seasonal high water table, saturated hydraulic conductivity after prolonged wetting, and depth to a layer with a very slow water transmission rate. Changes in soil properties caused by land management or climate changes also cause the hydrologic soil group to change. The influence of ground cover is treated independently. There are four hydrologic soil groups, A, B, C, and D, and three dual groups, A/D, B/D, and C/D. In the dual groups, the first letter is for drained areas and the second letter is for undrained areas.

The four hydrologic soil groups are described in the following paragraphs:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly."

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Percentage of rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

References:

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

Report—Engineering Properties

Absence of an entry indicates that the data were not estimated. The asterisk '*' denotes the representative texture; other possible textures follow the dash. The criteria for determining the hydrologic soil group for individual soil components is found in the National Engineering Handbook, Chapter 7 issued May 2007(http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba). Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Engineering Properties–San Diego County Area, California														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
CbD—Carlsbad gravelly loamy sand, 9 to 15 percent slopes														
Carlsbad	85	B	0-21	Gravelly loamy sand	SM	A-1	0- 0- 0	0- 0- 0	80-85-90	60-68-75	30-40-50	10-15-20	0-0 -0	NP
			21-33	Loamy sand	SM	A-1, A-2	0- 0- 0	0- 0- 0	95-98-100	90-95-100	45-55-65	15-20-25	0-0 -0	NP
			33-50	Indurated	—	—	—	—	—	—	—	—	—	—
CbE—Carlsbad gravelly loamy sand, 15 to 30 percent slopes														
Carlsbad	85	B	0-21	Gravelly loamy sand	SM	A-1	0- 0- 0	0- 0- 0	80-85-90	60-68-75	30-40-50	10-15-20	0-0 -0	NP
			21-28	Loamy sand	SM	A-1, A-2	0- 0- 0	0- 0- 0	95-98-100	90-95-100	45-55-65	15-20-25	0-0 -0	NP
			28-42	Indurated	—	—	—	—	—	—	—	—	—	—

Engineering Properties–San Diego County Area, California														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
CcE—Carlsbad-Urban land complex, 9 to 30 percent slopes														
Carlsbad	50	B	0-21	Gravelly loamy sand	SM	A-1	0- 0- 0	0- 0- 0	80-85-90	60-68-75	30-40-50	10-15-20	0-0 -0	NP
			21-39	Loamy sand	SM	A-1, A-2	0- 0- 0	0- 0- 0	95-98-100	90-95-100	45-55-65	15-20-25	0-0 -0	NP
			39-50	Indurated	—	—	—	—	—	—	—	—	—	—
Urban land	30		0-6	Variable	—	—	—	—	—	—	—	—	—	—
CsB—Corralitos loamy sand, 0 to 5 percent slopes														
Corralitos	85	A	0-12	Loamy sand	SM	A-2	0- 0- 0	0- 0- 0	95-98-100	90-95-100	50-55-60	15-23-30	0-0 -0	NP
			12-43	Loamy fine sand, loamy sand	SM	A-2	0- 0- 0	0- 0- 0	95-98-100	90-95-100	50-60-70	15-23-30	0-0 -0	NP
			43-72	Sand, fine sand	SP-SM	A-1, A-2, A-3	0- 0- 0	0- 0- 0	95-98-100	90-95-100	40-58-75	5-10- 15	0-0 -0	NP
CsC—Corralitos loamy sand, 5 to 9 percent slopes														
Corralitos	85	A	0-9	Loamy sand	SM	A-2	0- 0- 0	0- 0- 0	95-98-100	90-95-100	50-55-60	15-23-30	0-0 -0	NP
			9-43	Loamy fine sand, loamy sand	SM	A-2	0- 0- 0	0- 0- 0	95-98-100	90-95-100	50-60-70	15-23-30	0-0 -0	NP
			43-72	Sand, fine sand	SP-SM	A-1, A-2, A-3	0- 0- 0	0- 0- 0	95-98-100	90-95-100	40-58-75	5-10- 15	0-0 -0	NP

Engineering Properties–San Diego County Area, California														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
CsD—Corralitos loamy sand, 9 to 15 percent slopes														
Corralitos	85	A	0-9	Loamy sand	SM	A-2	0- 0- 0	0- 0- 0	95-98-100	90-95-100	50-55-60	15-23-30	0-0 -0	NP
			9-43	Loamy fine sand, loamy sand	SM	A-2	0- 0- 0	0- 0- 0	95-98-100	90-95-100	50-60-70	15-23-30	0-0 -0	NP
			43-72	Sand, fine sand	SP-SM	A-1, A-2, A-3	0- 0- 0	0- 0- 0	95-98-100	90-95-100	40-58-75	5-10- 15	0-0 -0	NP
HrD2—Huerhuero loam, 9 to 15 percent slopes, eroded														
Huerhuero	85	D	0-12	Loam	CL-ML, ML	A-4	0- 0- 0	0- 0- 0	95-98-100	90-95-100	80-88-95	50-63-75	25-30 -35	5-8 -10
			12-55	Clay loam, clay	CH, CL	A-7	0- 0- 0	0- 0- 0	95-98-100	90-95-100	90-95-100	70-83-95	40-50 -60	20-25-30
			55-72	Stratified sand to sandy loam	SC-SM	A-2	0- 0- 0	0- 0- 0	90-95-100	90-95-100	50-63-75	25-30-35	15-20 -25	5-8 -10

ATTACHMENT 2
BACKUP FOR PDP HYDROMODIFICATION CONTROL MEASURES

This is the cover sheet for Attachment 2.

☐ Mark this box if this attachment is empty because the project is exempt from PDP hydromodification management requirements.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	Contents	Checklist
Attachment 2a	Hydromodification Management Exhibit (Required)	☒ Included See Hydromodification Management Exhibit Checklist on the back of this Attachment cover sheet.
Attachment 2b	Management of Critical Coarse Sediment Yield Areas (WMAA Exhibit is required, additional analyses are optional) See Section 6.2 of the BMP Design .	☒ Exhibit showing project drainage boundaries marked on WMAA Critical Coarse Sediment Yield Area Map (Required) Optional analyses for Critical Coarse Sediment Yield Area Determination ☐ 6.2.1 Verification of Geomorphic Landscape Units Onsite ☐ 6.2.2 Downstream Systems Sensitivity to Coarse Sediment ☐ 6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite
Attachment 2c	Geomorphic Assessment of Receiving Channels (Optional) See Section 6.3.4 of the BMP Design Manual.	☒ Not performed ☐ Included ☐ Submitted as separate stand-alone document
Attachment 2d	Flow Control Facility Design, including Structural BMP Drawdown Calculations and Overflow Design Summary (Required) See Chapter 6 and Appendix G of the BMP Design Manual	☒ Included ☐ Submitted as separate stand-alone document
Attachment 2e	Vector Control Plan (Required when structural BMPs will not drain in 96 hours)	☐ Included ☒ Not required because BMPs will drain in less than 96 hours

Use this checklist to ensure the required information has been included on the Hydromodification Management Exhibit:

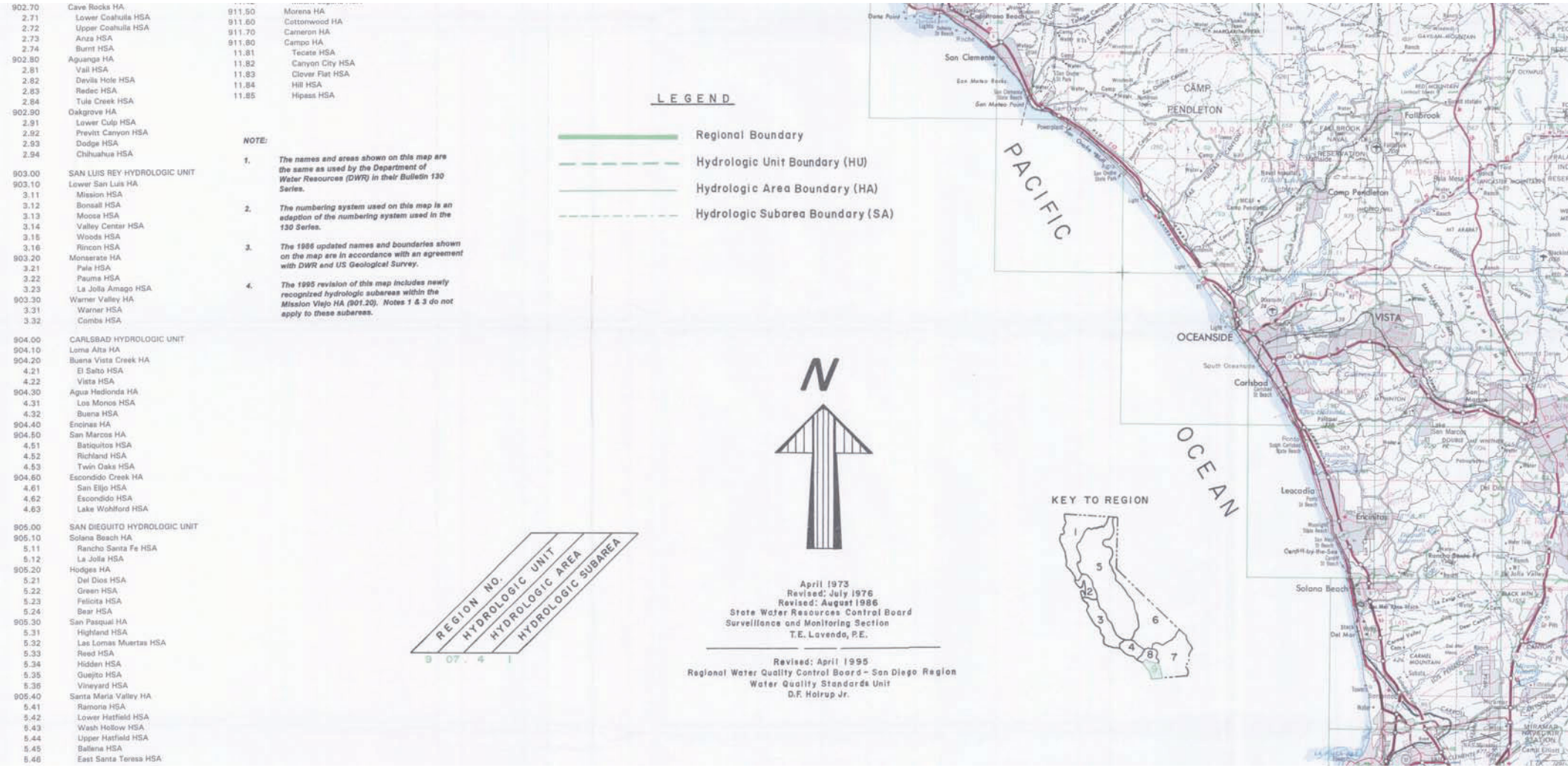
The Hydromodification Management Exhibit must identify:

☒ Underlying hydrologic soil group
☒ Approximate depth to groundwater
☒ Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
☐ Critical coarse sediment yield areas to be protected
☒ Existing topography
☒ Existing and proposed site drainage network and connections to drainage offsite
☒ Proposed grading
☒ Proposed impervious features
☒ Proposed design features and surface treatments used to minimize imperviousness
☒ Point(s) of Compliance (POC) for Hydromodification Management
☒ Existing and proposed drainage boundary and drainage area to each POC (when necessary, create separate exhibits for pre-development and post-project conditions)
☒ Structural BMPs for hydromodification management (identify location, type of BMP, and size/detail)

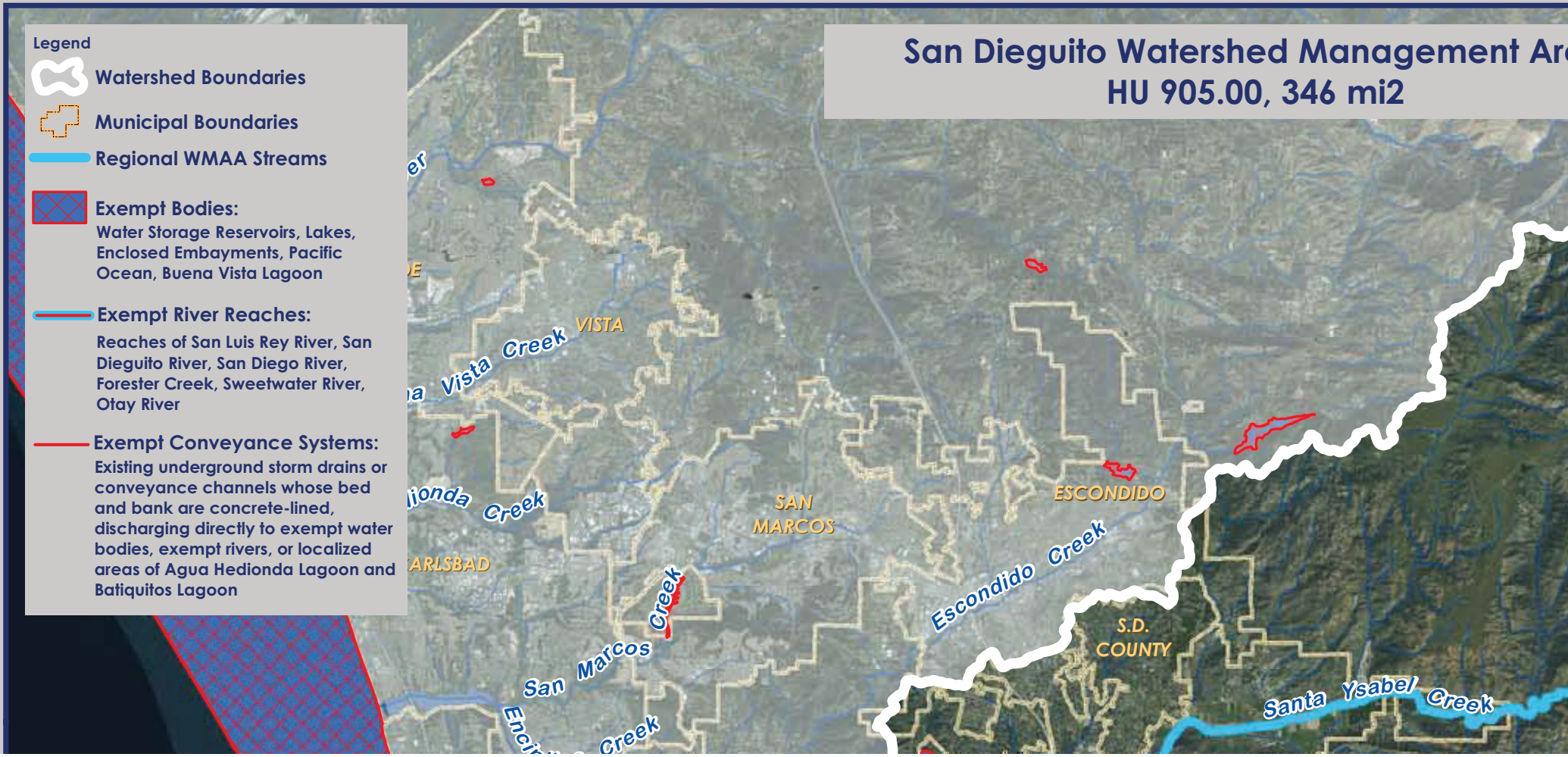
SDRWQCB BASIN PLAN MAP



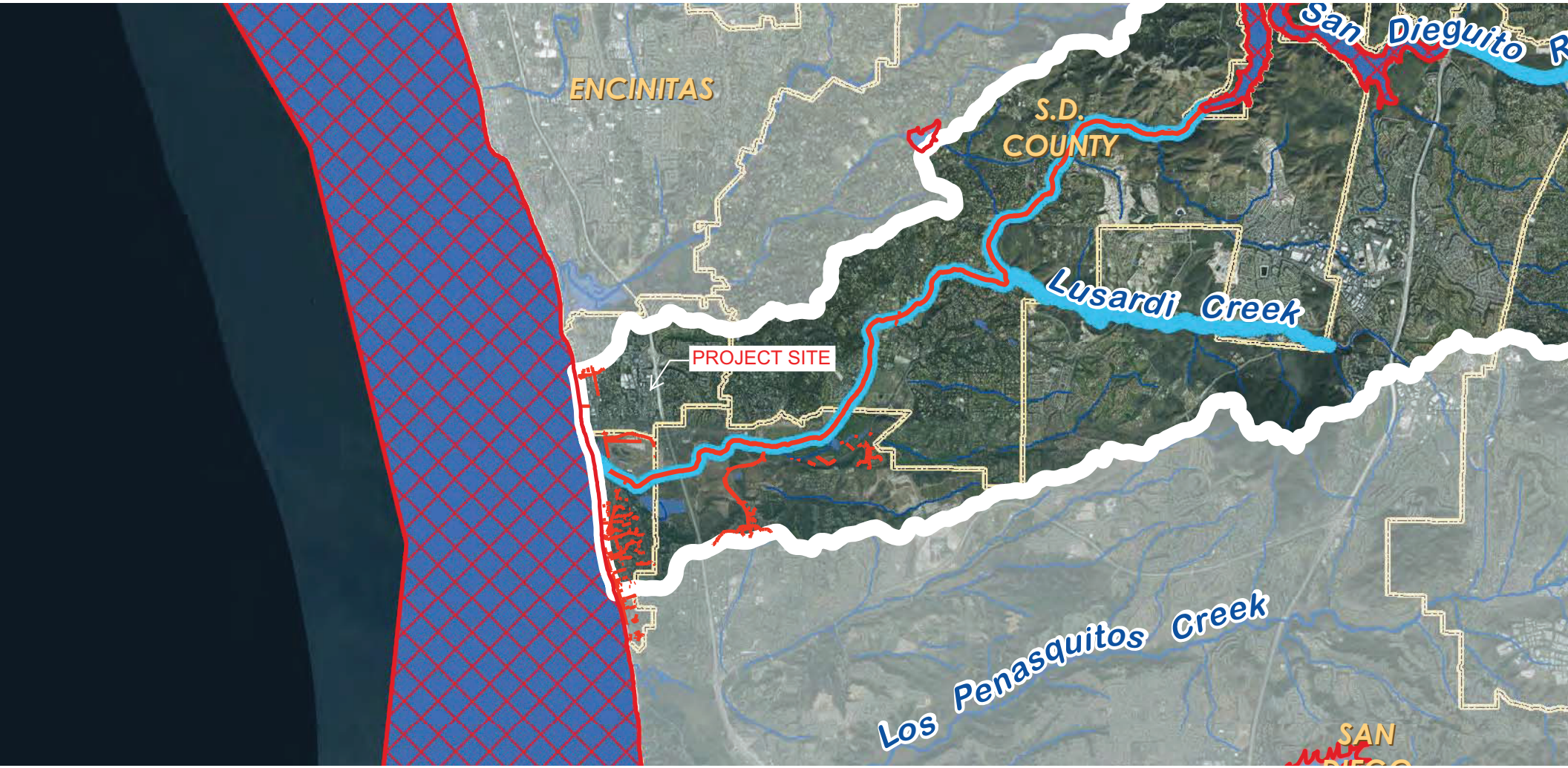
SDRWQCB BASIN PLAN MAP (LEGEND)



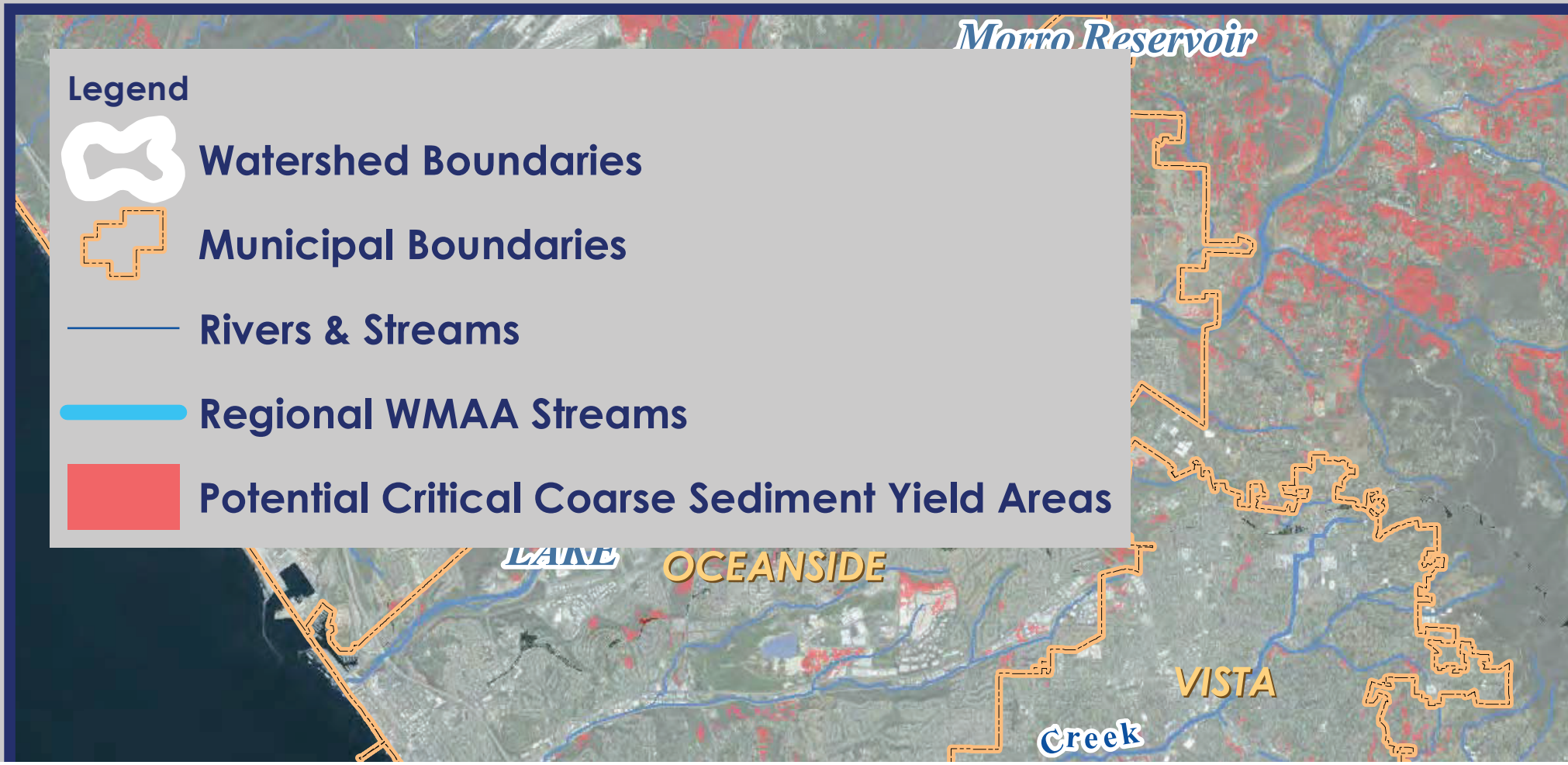
HYDROMOFICATION MANAGEMENT
EXEMPT AREAS (LEGEND)



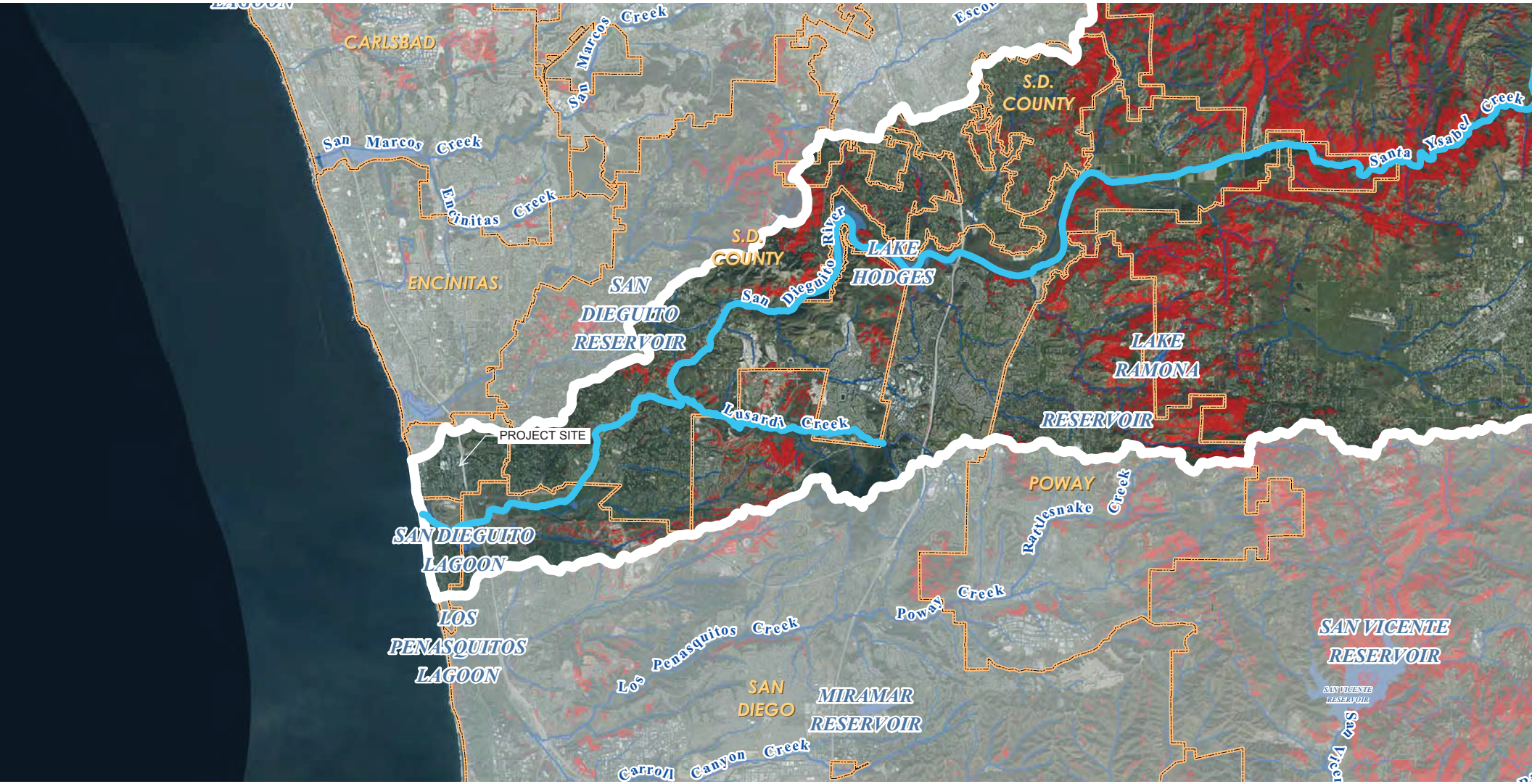
HYDROMODIFICATION
MANAGEMENT EXEMPT AREAS



POTENTIAL CRITICAL COARSE
SEDIMENT TIELD AREAS (LEGEND)



POTENTIAL CRITICAL SOARSE
SEDIMENT YIELD AREAS



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STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-3500 OR APPROVED EQUAL.
2. CHAMBERS SHALL BE MADE FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORT PANELS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
4. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
5. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
6. CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOADS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
7. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. THE CHAMBER MANUFACTURER SHALL SUBMIT THE FOLLOWING UPON REQUEST TO THE SITE DESIGN ENGINEER FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE:
   a. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY AASHTO FOR THERMOPLASTIC PIPE.
   b. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET. THE 50 YEAR CREEP MODULUS DATA SPECIFIED IN ASTM F2418 MUST BE USED AS PART OF THE AASHTO STRUCTURAL EVALUATION TO VERIFY LONG-TERM PERFORMANCE.
   c. STRUCTURAL CROSS SECTION DETAIL ON WHICH THE STRUCTURAL EVALUATION IS BASED.
8. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-3500 CHAMBER SYSTEM

1. STORMTECH MC-3500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS.

   STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 9" (230 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4-2" (20-50 mm) MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4.
9. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING..
10. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-3500 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

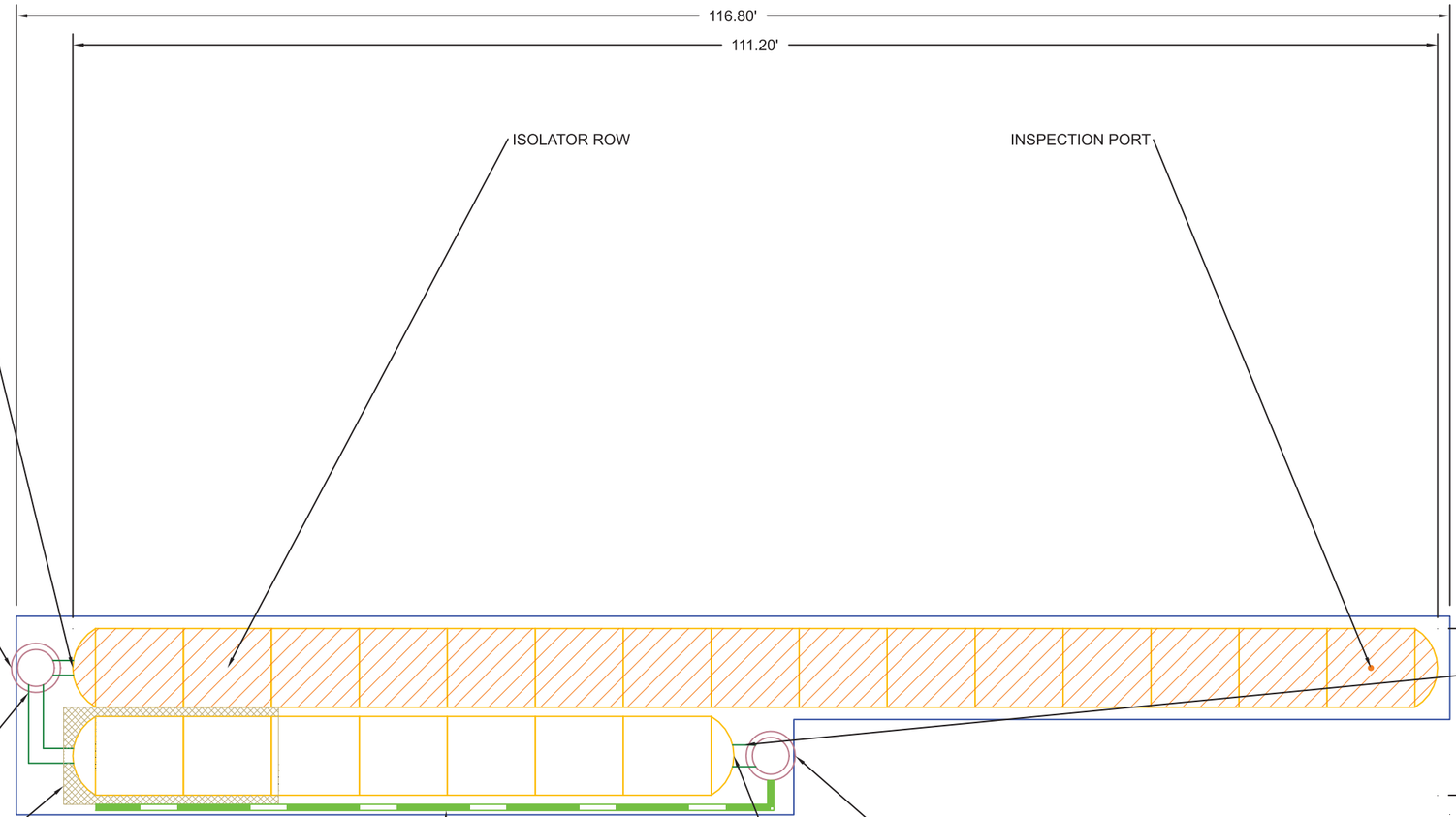
CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

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CONCEPTUAL LAYOUT

(22) STORMTECH MC-3500 CHAMBERS
(4) STORMTECH MC-3500 END CAPS
INSTALLED WITH 12 " COVER STONE, 9 " BASE STONE, 40% STONE VOID
INSTALLED SYSTEM VOLUME: 4732 CF
AREA OF SYSTEM: 1475 **FT²**
PERIMETER OF SYSTEM: 266 **FT**

COMPUTER GENERATED CONCEPTUAL LAYOUT - NOT FOR CONSTRUCTION



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SOLANA BEACH

DATE: 02/06/2018 | DRAWN: DM | CHECKED: ---
PROJECT #: Tool

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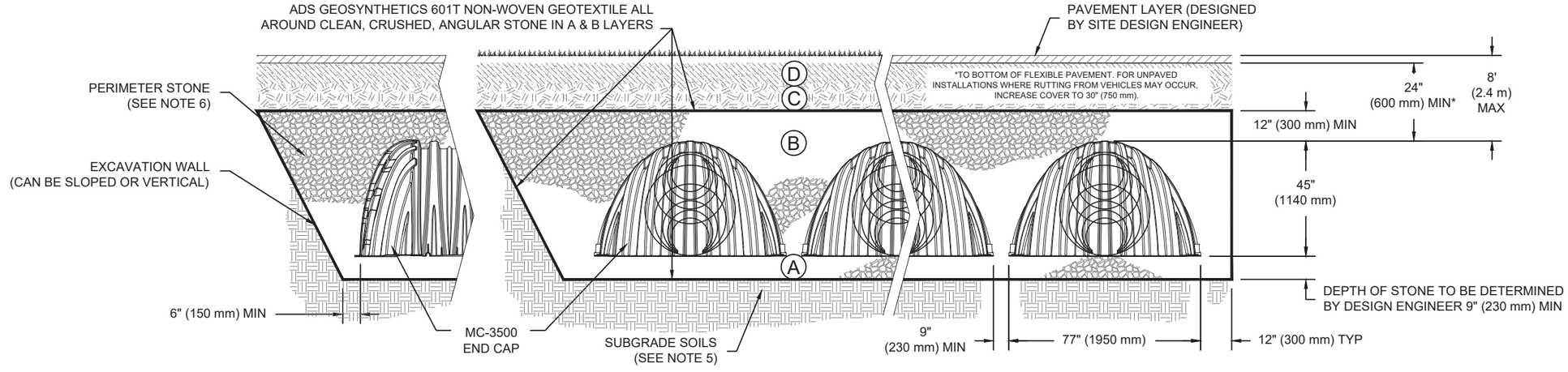
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NOT TO SCALE

ACCEPTABLE FILL MATERIALS: STORMTECH MC-3500 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4-2 INCH (20-50 mm)	AASHTO M43[1] 3, 4	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4-2 INCH (20-50 mm)	AASHTO M43[1] 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. [2] [3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



NOTES:

1. MC-3500 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. MC-3500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
4. THE "SITE DESIGN ENGINEER" REFERS TO THE ENGINEER RESPONSIBLE FOR THE DESIGN AND LAYOUT OF THE STORMTECH CHAMBERS FOR THIS PROJECT.
5. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
6. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
7. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.

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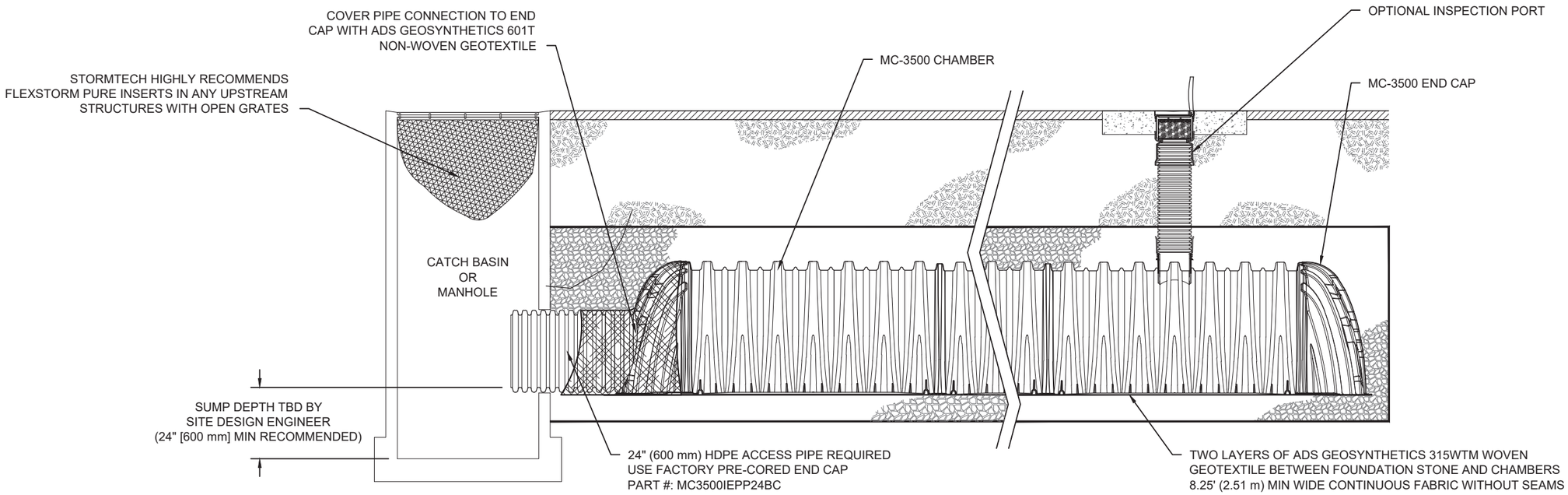
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MC-3500 ISOLATOR ROW DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

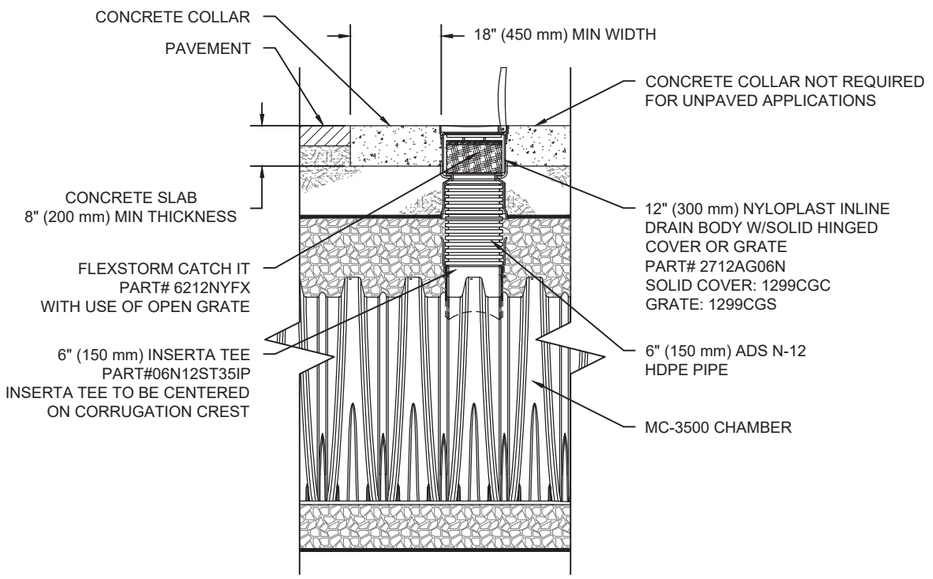
STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



MC-3500 6" INSPECTION PORT DETAIL
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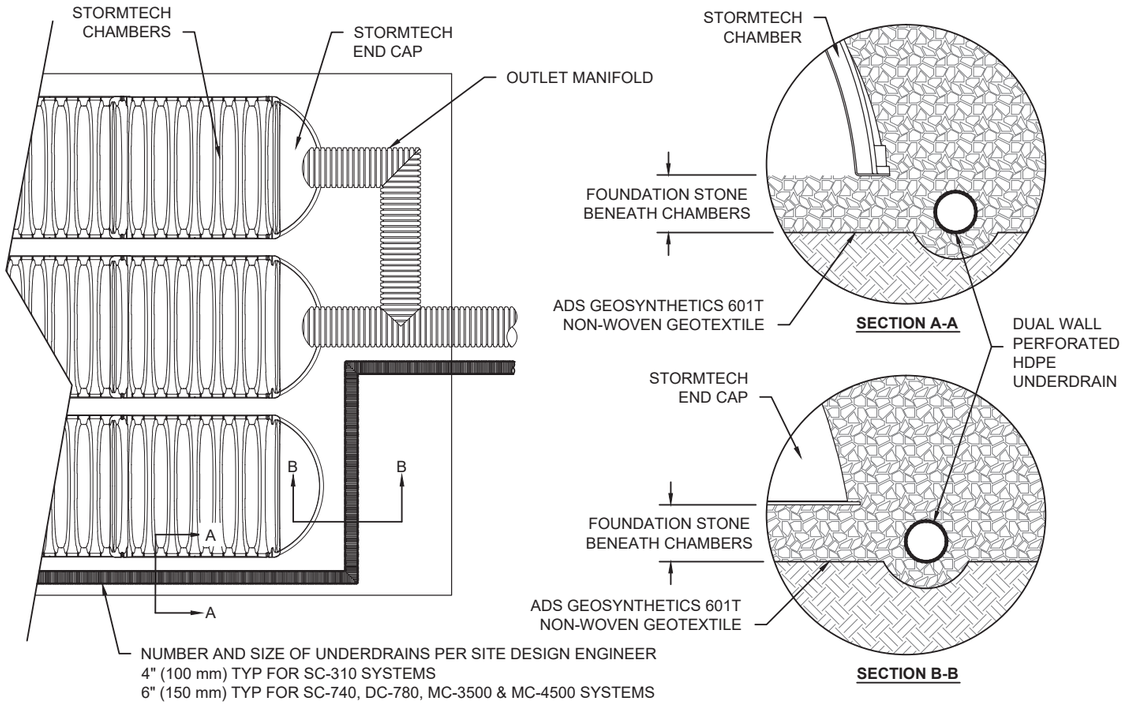
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UNDERDRAIN DETAIL

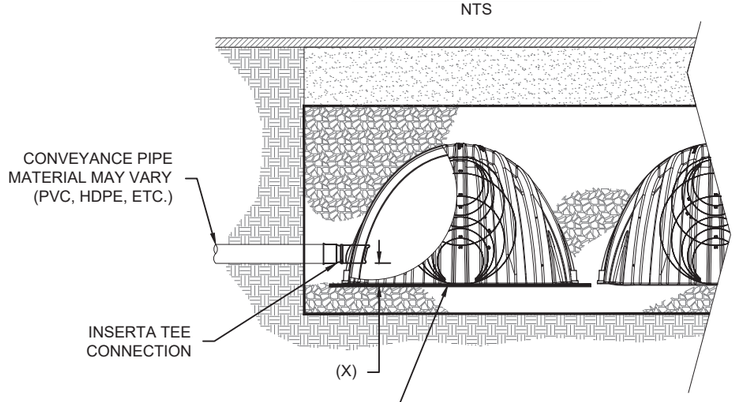
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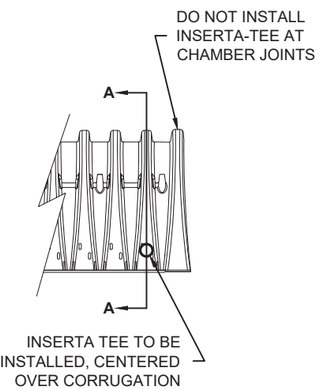
NUMBER AND SIZE OF UNDERDRAINS PER SITE DESIGN ENGINEER
4" (100 mm) TYP FOR SC-310 SYSTEMS
6" (150 mm) TYP FOR SC-740, DC-780, MC-3500 & MC-4500 SYSTEMS

INSERTA TEE DETAIL

NTS



SECTION A-A



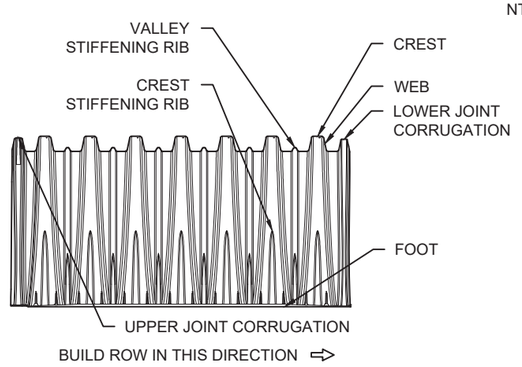
SIDE VIEW

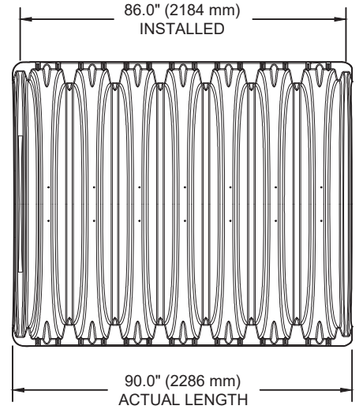
NOTE:
PART NUMBERS WILL VARY BASED ON INLET PIPE MATERIALS.
CONTACT STORMTECH FOR MORE INFORMATION.

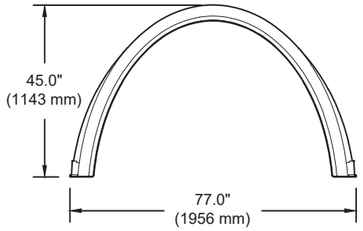
CHAMBER	MAX DIAMETER OF INSERTA TEE	HEIGHT FROM BASE OF CHAMBER (X)
SC-310	6" (150 mm)	4" (100 mm)
SC-740	10" (250 mm)	4" (100 mm)
DC-780	10" (250 mm)	4" (100 mm)
MC-3500	12" (300 mm)	6" (150 mm)
MC-4500	12" (300 mm)	8" (200 mm)
INSERTA TEE FITTINGS AVAILABLE FOR SDR 26, SDR 35, SCH 40 IPS GASKETED & SOLVENT WELD, N-12, HP STORM, C-900 OR DUCTILE IRON		

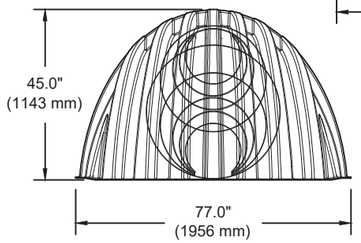
MC-3500 TECHNICAL SPECIFICATION

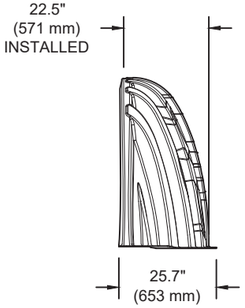
NTS











NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	77.0" X 45.0" X 86.0"	(1956 mm X 1143 mm X 2184 mm)
CHAMBER STORAGE	109.9 CUBIC FEET	(3.11 m³)
MINIMUM INSTALLED STORAGE*	178.9 CUBIC FEET	(5.06 m³)
WEIGHT	135.0 lbs.	(61.2 kg)

NOMINAL END CAP SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	77.0" X 45.0" X 22.5"	(1956 mm X 1143 mm X 571 mm)
END CAP STORAGE	14.9 CUBIC FEET	(0.42 m³)
MINIMUM INSTALLED STORAGE*	46.0 CUBIC FEET	(1.30 m³)
WEIGHT	50.0 lbs.	(22.7 kg)

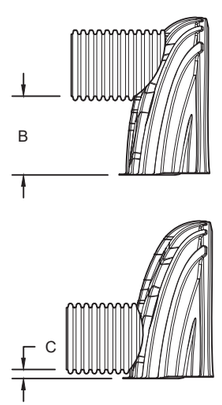
*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION AND BETWEEN CHAMBERS,
12" (305 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY

STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"

PART #	STUB	B	C
MC3500IEPP06T	6" (150 mm)	33.21" (844 mm)	---
MC3500IEPP06B		---	0.66" (17 mm)
MC3500IEPP08T	8" (200 mm)	31.16" (791 mm)	---
MC3500IEPP08B		---	0.81" (21 mm)
MC3500IEPP10T	10" (250 mm)	29.04" (738 mm)	---
MC3500IEPP10B		---	0.93" (24 mm)
MC3500IEPP12T	12" (300 mm)	26.36" (670 mm)	---
MC3500IEPP12B		---	1.35" (34 mm)
MC3500IEPP15T	15" (375 mm)	23.39" (594 mm)	---
MC3500IEPP15B		---	1.50" (38 mm)
MC3500IEPP18TC	18" (450 mm)	20.03" (509 mm)	---
MC3500IEPP18BC		---	1.77" (45 mm)
MC3500IEPP24TC	24" (600 mm)	14.48" (368 mm)	---
MC3500IEPP24BC		---	2.06" (52 mm)
MC3500IEPP30BC	30" (750 mm)	---	

NOTE: ALL DIMENSIONS ARE NOMINAL

CUSTOM PRECORED INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS.
CUSTOM INVERT LOCATIONS ON THE MC-3500 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm)
THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHTEST POSSIBLE FOR THE PIPE SIZE.



IDA AVE APARTMENTS
SOLANA BEACH

DATE: 02/06/2018 | DRAWN: DM | CHECKED: ---
PROJECT #: Tool

REV	DRW	CHK	DESCRIPTION

StormTech
Detention • Retention • Water Quality
70 INWOOD ROAD, SUITE 3 | ROCKY HILL | CT | 06067
860-529-8188 | 888-892-2694 | WWW.STORMTECH.COM

ADS
ADVANCED DRAINAGE SYSTEMS, INC.
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

MC-SERIES END CAP INSERTION DETAIL

NTS

NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

IDA AVE APARTMENTS
SOLANA BEACH

DATE: 02/06/2018 | DRAWN: DM | PROJECT #: Tool | CHECKED: ---

REV	DRW	CHK	DESCRIPTION

StormTech
Detention•Retention•Water Quality
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```
     U N I T  H Y D R O G R A P H  A N A L Y S I S
Copyright (c) CIVILCADD/CIVILDESIGN, 1990 - 2004, Version 7.1
           Study date  07/19/21  File: 1574UHPR10.out
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Program License Serial Number 6313
----------------------------------------------------------------------
117.1574 IDA AVE APARTMENTS
10-YEAR UNIT HYDROGRAPH
PROPOSED CONDITIONS
----------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

Storm Event Year = 10
Antecedent Moisture Condition = 1
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used
Area averaged rainfall isohyetal data:
      Sub-Area(Ac.)       Rainfall (In)
           1.00             3.00

Rainfall Distribution pattern used in study:
Type B for San Diego area of California
----------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

********* Area-Averaged SCS Curve Number and Fm *********

Area       Area          SCS CN    SCS CN    Fm      Soil
(Ac.)      fract         (AMC2)    (AMC1)   (In/Hr)  Group
     0.50   0.500         77.0      59.4     0.100    A
     0.50   0.500         98.0      98.0

Area-averaged catchment SCS Curve Number AMC(1) = 78.700
Area-averaged Fm value using values listed =  0.050(In/Hr)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
User entry of time of concentration  =   0.138 (hours)
Watershed area =       1.00(Ac.)
Catchment Lag time =   0.083 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 100.6441
Hydrograph baseflow =     0.00(CFS)
Minimum watershed loss rate(Fm) =  0.013(In/Hr)
Average adjusted SCS Curve Number = 78.700

Rainfall depth area reduction factors:
Using a total area of       1.00(Ac.) (Ref: SCS Sup A, Sec.4)

Pacific Coastal Climate ratio used
Areal factor ratio (rainfall reduction) = 1.000
Rainfall entered for study =    3.000(In)
Adjusted rainfall =    3.000(In)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

The following unit hydrograph was developed using an S-Graph interpolated by time percentage of lag time vs. percentage of peak flow. The S-Graphs for Valley, Foothill, and Mountain were developed by the U.S. Army Corps of Engineers for use in the respective type of basins located in Southern California. (Hydrology San Gabrial River ... U.S. Engineer Office, Dec 1944, revised Jul 1946) The Desert S-Graph is from Report ... on ... Tahquitz Creek, California, same U.S. offfice, Corps of Engineers, June 1963. The Valley Developed S-Graph is used by Orange and San Bernardino counties in California to represent the characteristics of valley areas with a large amount of development. Because of the wide variety in topography in Southern California, these synthetic unit hydrographs were included for use as options in any geographic location.

The SCS(Soil Conservation Service Dimensionless S-Graph, SCS handbook, of 1972, applies to a broad cross section of geographic locations and hydrologic regions.

The User Defined hydrograph converts the user Q/Qp vs. T/Tp values into an S-Graph based on lag = Tp/0.9. Then, for the lag time used, the S-Graph in interpolated in time % of lag.

The following S-Graph or S-Graph combination is used in this study:

FOOTHILL S-Graph

U N I T H Y D R O G R A P H

(K = 12.10 (CFS))

Time Ratio (t/Lag)	Time (hrs)	Discharge Ratios (Q/Qp)	Q (CFS)	Mass Curve Ratios (Qa/Q)
1.01	0.083	0.263	1.772	0.146
2.01	0.167	1.000	6.749	0.704
3.02	0.250	0.328	2.217	0.887
4.03	0.333	0.132	0.891	0.961
5.03	0.417	0.043	0.290	0.985
6.04	0.500	0.015	0.102	0.993
7.05	0.583	0.012	0.079	1.000

For each time interval of the 6 or 24 hour storm, the total rainfall up to that storm time is calculated. Then the Soil Conservation Service SCS (report 1972, 1975) area averaged Curve Number (CN) is used to determine the amount of direct runoff in (In) using the following equations:

$$Q = \frac{(P - Ia)^2}{P - Ia + S}$$

Where:
Q = direct runoff, P = depth of precipitation, Ia = Initial Abstraction and S is the watershed storage in inches. S and Ia are given by the following equations:

$$S = \frac{1000}{CN} - 10 \quad \text{and} \quad Ia = 0.2\,S$$

Note: If Metric (SI) Units are used, rainfall data is converted by the program internally into inches for these calculations.

Note: In the following printout, the revised runoff column is only used when the minimum soil loss rate, fm, exceeds the normal loss rate of delta P(dP) - delta Q(dQ) then the dP-dQ column equals fm = 0.013(In) (for time interval = 0.001(In)) and the revised runoff is shown in the last column.

Time Period (hours)	Total Rainfall (In) P	Total SCS Runoff (In) Q	Rainfall Amount (In) dP	Runoff Amount (In) dQ	Infiltr-ation (In) dP-dQ	Revised Runoff Min Loss Rate
0.08	0.0045	0.0000	0.0045	0.0000	0.0045	--------
0.17	0.0090	0.0000	0.0045	0.0000	0.0045	--------
0.25	0.0135	0.0000	0.0045	0.0000	0.0045	--------
0.33	0.0180	0.0000	0.0045	0.0000	0.0045	--------
0.42	0.0225	0.0000	0.0045	0.0000	0.0045	--------
0.50	0.0270	0.0000	0.0045	0.0000	0.0045	--------
0.58	0.0305	0.0000	0.0035	0.0000	0.0035	--------
0.67	0.0340	0.0000	0.0035	0.0000	0.0035	--------
0.75	0.0375	0.0000	0.0035	0.0000	0.0035	--------
0.83	0.0410	0.0000	0.0035	0.0000	0.0035	--------
0.92	0.0445	0.0000	0.0035	0.0000	0.0035	--------
1.00	0.0480	0.0000	0.0035	0.0000	0.0035	--------
1.08	0.0525	0.0000	0.0045	0.0000	0.0045	--------
1.17	0.0570	0.0000	0.0045	0.0000	0.0045	--------
1.25	0.0615	0.0000	0.0045	0.0000	0.0045	--------
1.33	0.0660	0.0000	0.0045	0.0000	0.0045	--------
1.42	0.0705	0.0000	0.0045	0.0000	0.0045	--------
1.50	0.0750	0.0000	0.0045	0.0000	0.0045	--------
1.58	0.0795	0.0000	0.0045	0.0000	0.0045	--------
1.67	0.0840	0.0000	0.0045	0.0000	0.0045	--------
1.75	0.0885	0.0000	0.0045	0.0000	0.0045	--------
1.83	0.0930	0.0000	0.0045	0.0000	0.0045	--------
1.92	0.0975	0.0000	0.0045	0.0000	0.0045	--------
2.00	0.1020	0.0000	0.0045	0.0000	0.0045	--------
2.08	0.1075	0.0000	0.0055	0.0000	0.0055	--------
2.17	0.1130	0.0000	0.0055	0.0000	0.0055	--------
2.25	0.1185	0.0000	0.0055	0.0000	0.0055	--------
2.33	0.1240	0.0000	0.0055	0.0000	0.0055	--------
2.42	0.1295	0.0000	0.0055	0.0000	0.0055	--------
2.50	0.1350	0.0000	0.0055	0.0000	0.0055	--------

2.58	0.1395	0.0000	0.0045	0.0000	0.0045	--------
2.67	0.1440	0.0000	0.0045	0.0000	0.0045	--------
2.75	0.1485	0.0000	0.0045	0.0000	0.0045	--------
2.83	0.1530	0.0000	0.0045	0.0000	0.0045	--------
2.92	0.1575	0.0000	0.0045	0.0000	0.0045	--------
3.00	0.1620	0.0000	0.0045	0.0000	0.0045	--------
3.08	0.1675	0.0000	0.0055	0.0000	0.0055	--------
3.17	0.1730	0.0000	0.0055	0.0000	0.0055	--------
3.25	0.1785	0.0000	0.0055	0.0000	0.0055	--------
3.33	0.1840	0.0000	0.0055	0.0000	0.0055	--------
3.42	0.1895	0.0000	0.0055	0.0000	0.0055	--------
3.50	0.1950	0.0000	0.0055	0.0000	0.0055	--------
3.58	0.2010	0.0000	0.0060	0.0000	0.0060	--------
3.67	0.2070	0.0000	0.0060	0.0000	0.0060	--------
3.75	0.2130	0.0000	0.0060	0.0000	0.0060	--------
3.83	0.2190	0.0000	0.0060	0.0000	0.0060	--------
3.92	0.2250	0.0000	0.0060	0.0000	0.0060	--------
4.00	0.2310	0.0000	0.0060	0.0000	0.0060	--------
4.08	0.2375	0.0000	0.0065	0.0000	0.0065	--------
4.17	0.2440	0.0000	0.0065	0.0000	0.0065	--------
4.25	0.2505	0.0000	0.0065	0.0000	0.0065	--------
4.33	0.2570	0.0000	0.0065	0.0000	0.0065	--------
4.42	0.2635	0.0000	0.0065	0.0000	0.0065	--------
4.50	0.2700	0.0000	0.0065	0.0000	0.0065	--------
4.58	0.2770	0.0000	0.0070	0.0000	0.0070	--------
4.67	0.2840	0.0000	0.0070	0.0000	0.0070	--------
4.75	0.2910	0.0000	0.0070	0.0000	0.0070	--------
4.83	0.2980	0.0000	0.0070	0.0000	0.0070	--------
4.92	0.3050	0.0000	0.0070	0.0000	0.0070	--------
5.00	0.3120	0.0000	0.0070	0.0000	0.0070	--------
5.08	0.3200	0.0000	0.0080	0.0000	0.0080	--------
5.17	0.3280	0.0000	0.0080	0.0000	0.0080	--------
5.25	0.3360	0.0000	0.0080	0.0000	0.0080	--------
5.33	0.3440	0.0000	0.0080	0.0000	0.0080	--------
5.42	0.3520	0.0000	0.0080	0.0000	0.0080	--------
5.50	0.3600	0.0000	0.0080	0.0000	0.0080	--------
5.58	0.3685	0.0000	0.0085	0.0000	0.0085	--------
5.67	0.3770	0.0000	0.0085	0.0000	0.0085	--------
5.75	0.3855	0.0000	0.0085	0.0000	0.0085	--------
5.83	0.3940	0.0000	0.0085	0.0000	0.0085	--------
5.92	0.4025	0.0000	0.0085	0.0000	0.0085	--------
6.00	0.4110	0.0000	0.0085	0.0000	0.0085	--------
6.08	0.4210	0.0000	0.0100	0.0000	0.0100	--------
6.17	0.4310	0.0000	0.0100	0.0000	0.0100	--------
6.25	0.4410	0.0000	0.0100	0.0000	0.0100	--------
6.33	0.4510	0.0000	0.0100	0.0000	0.0100	--------
6.42	0.4610	0.0000	0.0100	0.0000	0.0100	--------
6.50	0.4710	0.0000	0.0100	0.0000	0.0100	--------
6.58	0.4825	0.0000	0.0115	0.0000	0.0115	--------
6.67	0.4940	0.0000	0.0115	0.0000	0.0115	--------
6.75	0.5055	0.0000	0.0115	0.0000	0.0115	--------
6.83	0.5170	0.0000	0.0115	0.0000	0.0115	--------
6.92	0.5285	0.0000	0.0115	0.0000	0.0115	--------
7.00	0.5400	0.0000	0.0115	0.0000	0.0115	--------

7.08	0.5550	0.0001	0.0150	0.0001	0.0149	--------
7.17	0.5700	0.0003	0.0150	0.0002	0.0148	--------
7.25	0.5850	0.0007	0.0150	0.0004	0.0146	--------
7.33	0.6000	0.0012	0.0150	0.0006	0.0144	--------
7.42	0.6150	0.0020	0.0150	0.0007	0.0143	--------
7.50	0.6300	0.0028	0.0150	0.0009	0.0141	--------
7.58	0.6525	0.0044	0.0225	0.0016	0.0209	--------
7.67	0.6750	0.0063	0.0225	0.0019	0.0206	--------
7.75	0.6975	0.0085	0.0225	0.0022	0.0203	--------
7.83	0.7200	0.0111	0.0225	0.0025	0.0200	--------
7.92	0.7425	0.0139	0.0225	0.0029	0.0196	--------
8.00	0.7650	0.0171	0.0225	0.0032	0.0193	--------
8.08	0.7985	0.0223	0.0335	0.0052	0.0283	--------
8.17	0.8320	0.0282	0.0335	0.0059	0.0276	--------
8.25	0.8655	0.0347	0.0335	0.0065	0.0270	--------
8.33	0.8990	0.0418	0.0335	0.0071	0.0264	--------
8.42	0.9325	0.0494	0.0335	0.0076	0.0259	--------
8.50	0.9660	0.0576	0.0335	0.0082	0.0253	--------
8.58	1.0100	0.0692	0.0440	0.0116	0.0324	--------
8.67	1.0540	0.0817	0.0440	0.0125	0.0315	--------
8.75	1.0980	0.0950	0.0440	0.0133	0.0307	--------
8.83	1.1420	0.1091	0.0440	0.0141	0.0299	--------
8.92	1.1860	0.1240	0.0440	0.0149	0.0291	--------
9.00	1.2300	0.1397	0.0440	0.0157	0.0283	--------
9.08	1.2780	0.1576	0.0480	0.0179	0.0301	--------
9.17	1.3260	0.1764	0.0480	0.0188	0.0292	--------
9.25	1.3740	0.1959	0.0480	0.0195	0.0285	--------
9.33	1.4220	0.2162	0.0480	0.0203	0.0277	--------
9.42	1.4700	0.2373	0.0480	0.0210	0.0270	--------
9.50	1.5180	0.2590	0.0480	0.0217	0.0263	--------
9.58	1.5590	0.2781	0.0410	0.0191	0.0219	--------
9.67	1.6000	0.2977	0.0410	0.0196	0.0214	--------
9.75	1.6410	0.3177	0.0410	0.0200	0.0210	--------
9.83	1.6820	0.3382	0.0410	0.0205	0.0205	--------
9.92	1.7230	0.3591	0.0410	0.0209	0.0201	--------
10.00	1.7640	0.3805	0.0410	0.0213	0.0197	--------
10.08	1.7845	0.3913	0.0205	0.0108	0.0097	--------
10.17	1.8050	0.4022	0.0205	0.0109	0.0096	--------
10.25	1.8255	0.4133	0.0205	0.0110	0.0095	--------
10.33	1.8460	0.4244	0.0205	0.0111	0.0094	--------
10.42	1.8665	0.4356	0.0205	0.0112	0.0093	--------
10.50	1.8870	0.4469	0.0205	0.0113	0.0092	--------
10.58	1.9005	0.4544	0.0135	0.0075	0.0060	--------
10.67	1.9140	0.4619	0.0135	0.0075	0.0060	--------
10.75	1.9275	0.4695	0.0135	0.0076	0.0059	--------
10.83	1.9410	0.4771	0.0135	0.0076	0.0059	--------
10.92	1.9545	0.4848	0.0135	0.0077	0.0058	--------
11.00	1.9680	0.4925	0.0135	0.0077	0.0058	--------
11.08	1.9795	0.4991	0.0115	0.0066	0.0049	--------
11.17	1.9910	0.5057	0.0115	0.0066	0.0049	--------
11.25	2.0025	0.5123	0.0115	0.0066	0.0049	--------
11.33	2.0140	0.5190	0.0115	0.0067	0.0048	--------
11.42	2.0255	0.5257	0.0115	0.0067	0.0048	--------
11.50	2.0370	0.5324	0.0115	0.0067	0.0048	--------

11.58	2.0475	0.5385	0.0105	0.0062	0.0043	--------
11.67	2.0580	0.5447	0.0105	0.0062	0.0043	--------
11.75	2.0685	0.5509	0.0105	0.0062	0.0043	--------
11.83	2.0790	0.5571	0.0105	0.0062	0.0043	--------
11.92	2.0895	0.5634	0.0105	0.0062	0.0043	--------
12.00	2.1000	0.5696	0.0105	0.0063	0.0042	--------
12.08	2.1100	0.5756	0.0100	0.0060	0.0040	--------
12.17	2.1200	0.5816	0.0100	0.0060	0.0040	--------
12.25	2.1300	0.5876	0.0100	0.0060	0.0040	--------
12.33	2.1400	0.5937	0.0100	0.0060	0.0040	--------
12.42	2.1500	0.5997	0.0100	0.0061	0.0039	--------
12.50	2.1600	0.6058	0.0100	0.0061	0.0039	--------
12.58	2.1695	0.6116	0.0095	0.0058	0.0037	--------
12.67	2.1790	0.6174	0.0095	0.0058	0.0037	--------
12.75	2.1885	0.6232	0.0095	0.0058	0.0037	--------
12.83	2.1980	0.6291	0.0095	0.0058	0.0037	--------
12.92	2.2075	0.6349	0.0095	0.0059	0.0036	--------
13.00	2.2170	0.6408	0.0095	0.0059	0.0036	--------
13.08	2.2255	0.6460	0.0085	0.0053	0.0032	--------
13.17	2.2340	0.6513	0.0085	0.0053	0.0032	--------
13.25	2.2425	0.6566	0.0085	0.0053	0.0032	--------
13.33	2.2510	0.6619	0.0085	0.0053	0.0032	--------
13.42	2.2595	0.6672	0.0085	0.0053	0.0032	--------
13.50	2.2680	0.6725	0.0085	0.0053	0.0032	--------
13.58	2.2760	0.6776	0.0080	0.0050	0.0030	--------
13.67	2.2840	0.6826	0.0080	0.0050	0.0030	--------
13.75	2.2920	0.6876	0.0080	0.0050	0.0030	--------
13.83	2.3000	0.6927	0.0080	0.0051	0.0029	--------
13.92	2.3080	0.6978	0.0080	0.0051	0.0029	--------
14.00	2.3160	0.7028	0.0080	0.0051	0.0029	--------
14.08	2.3250	0.7086	0.0090	0.0057	0.0033	--------
14.17	2.3340	0.7143	0.0090	0.0057	0.0033	--------
14.25	2.3430	0.7201	0.0090	0.0057	0.0033	--------
14.33	2.3520	0.7258	0.0090	0.0058	0.0032	--------
14.42	2.3610	0.7316	0.0090	0.0058	0.0032	--------
14.50	2.3700	0.7374	0.0090	0.0058	0.0032	--------
14.58	2.3750	0.7406	0.0050	0.0032	0.0018	--------
14.67	2.3800	0.7438	0.0050	0.0032	0.0018	--------
14.75	2.3850	0.7471	0.0050	0.0032	0.0018	--------
14.83	2.3900	0.7503	0.0050	0.0032	0.0018	--------
14.92	2.3950	0.7535	0.0050	0.0032	0.0018	--------
15.00	2.4000	0.7568	0.0050	0.0032	0.0018	--------
15.08	2.4080	0.7620	0.0080	0.0052	0.0028	--------
15.17	2.4160	0.7672	0.0080	0.0052	0.0028	--------
15.25	2.4240	0.7724	0.0080	0.0052	0.0028	--------
15.33	2.4320	0.7776	0.0080	0.0052	0.0028	--------
15.42	2.4400	0.7828	0.0080	0.0052	0.0028	--------
15.50	2.4480	0.7881	0.0080	0.0052	0.0028	--------
15.58	2.4555	0.7930	0.0075	0.0049	0.0026	--------
15.67	2.4630	0.7979	0.0075	0.0049	0.0026	--------
15.75	2.4705	0.8029	0.0075	0.0049	0.0026	--------
15.83	2.4780	0.8078	0.0075	0.0049	0.0026	--------
15.92	2.4855	0.8128	0.0075	0.0050	0.0025	--------
16.00	2.4930	0.8177	0.0075	0.0050	0.0025	--------

16.08	2.5000	0.8224	0.0070	0.0046	0.0024	--------
16.17	2.5070	0.8270	0.0070	0.0046	0.0024	--------
16.25	2.5140	0.8317	0.0070	0.0047	0.0023	--------
16.33	2.5210	0.8363	0.0070	0.0047	0.0023	--------
16.42	2.5280	0.8410	0.0070	0.0047	0.0023	--------
16.50	2.5350	0.8457	0.0070	0.0047	0.0023	--------
16.58	2.5425	0.8507	0.0075	0.0050	0.0025	--------
16.67	2.5500	0.8557	0.0075	0.0050	0.0025	--------
16.75	2.5575	0.8608	0.0075	0.0050	0.0025	--------
16.83	2.5650	0.8658	0.0075	0.0050	0.0025	--------
16.92	2.5725	0.8708	0.0075	0.0050	0.0025	--------
17.00	2.5800	0.8759	0.0075	0.0051	0.0024	--------
17.08	2.5860	0.8800	0.0060	0.0041	0.0019	--------
17.17	2.5920	0.8840	0.0060	0.0041	0.0019	--------
17.25	2.5980	0.8881	0.0060	0.0041	0.0019	--------
17.33	2.6040	0.8921	0.0060	0.0041	0.0019	--------
17.42	2.6100	0.8962	0.0060	0.0041	0.0019	--------
17.50	2.6160	0.9003	0.0060	0.0041	0.0019	--------
17.58	2.6225	0.9047	0.0065	0.0044	0.0021	--------
17.67	2.6290	0.9091	0.0065	0.0044	0.0021	--------
17.75	2.6355	0.9136	0.0065	0.0044	0.0021	--------
17.83	2.6420	0.9180	0.0065	0.0044	0.0021	--------
17.92	2.6485	0.9224	0.0065	0.0044	0.0021	--------
18.00	2.6550	0.9269	0.0065	0.0044	0.0021	--------
18.08	2.6600	0.9303	0.0050	0.0034	0.0016	--------
18.17	2.6650	0.9337	0.0050	0.0034	0.0016	--------
18.25	2.6700	0.9372	0.0050	0.0034	0.0016	--------
18.33	2.6750	0.9406	0.0050	0.0034	0.0016	--------
18.42	2.6800	0.9440	0.0050	0.0034	0.0016	--------
18.50	2.6850	0.9475	0.0050	0.0034	0.0016	--------
18.58	2.6900	0.9509	0.0050	0.0034	0.0016	--------
18.67	2.6950	0.9544	0.0050	0.0034	0.0016	--------
18.75	2.7000	0.9578	0.0050	0.0035	0.0015	--------
18.83	2.7050	0.9613	0.0050	0.0035	0.0015	--------
18.92	2.7100	0.9647	0.0050	0.0035	0.0015	--------
19.00	2.7150	0.9682	0.0050	0.0035	0.0015	--------
19.08	2.7195	0.9713	0.0045	0.0031	0.0014	--------
19.17	2.7240	0.9744	0.0045	0.0031	0.0014	--------
19.25	2.7285	0.9776	0.0045	0.0031	0.0014	--------
19.33	2.7330	0.9807	0.0045	0.0031	0.0014	--------
19.42	2.7375	0.9838	0.0045	0.0031	0.0014	--------
19.50	2.7420	0.9869	0.0045	0.0031	0.0014	--------
19.58	2.7470	0.9904	0.0050	0.0035	0.0015	--------
19.67	2.7520	0.9939	0.0050	0.0035	0.0015	--------
19.75	2.7570	0.9974	0.0050	0.0035	0.0015	--------
19.83	2.7620	1.0009	0.0050	0.0035	0.0015	--------
19.92	2.7670	1.0044	0.0050	0.0035	0.0015	--------
20.00	2.7720	1.0079	0.0050	0.0035	0.0015	--------
20.08	2.7775	1.0117	0.0055	0.0038	0.0017	--------
20.17	2.7830	1.0156	0.0055	0.0039	0.0016	--------
20.25	2.7885	1.0194	0.0055	0.0039	0.0016	--------
20.33	2.7940	1.0233	0.0055	0.0039	0.0016	--------
20.42	2.7995	1.0272	0.0055	0.0039	0.0016	--------
20.50	2.8050	1.0310	0.0055	0.0039	0.0016	--------

20.58	2.8100	1.0345	0.0050	0.0035	0.0015	--------
20.67	2.8150	1.0381	0.0050	0.0035	0.0015	--------
20.75	2.8200	1.0416	0.0050	0.0035	0.0015	--------
20.83	2.8250	1.0451	0.0050	0.0035	0.0015	--------
20.92	2.8300	1.0486	0.0050	0.0035	0.0015	--------
21.00	2.8350	1.0522	0.0050	0.0035	0.0015	--------
21.08	2.8395	1.0554	0.0045	0.0032	0.0013	--------
21.17	2.8440	1.0585	0.0045	0.0032	0.0013	--------
21.25	2.8485	1.0617	0.0045	0.0032	0.0013	--------
21.33	2.8530	1.0649	0.0045	0.0032	0.0013	--------
21.42	2.8575	1.0681	0.0045	0.0032	0.0013	--------
21.50	2.8620	1.0713	0.0045	0.0032	0.0013	--------
21.58	2.8665	1.0745	0.0045	0.0032	0.0013	--------
21.67	2.8710	1.0777	0.0045	0.0032	0.0013	--------
21.75	2.8755	1.0809	0.0045	0.0032	0.0013	--------
21.83	2.8800	1.0841	0.0045	0.0032	0.0013	--------
21.92	2.8845	1.0873	0.0045	0.0032	0.0013	--------
22.00	2.8890	1.0905	0.0045	0.0032	0.0013	--------
22.08	2.8935	1.0937	0.0045	0.0032	0.0013	--------
22.17	2.8980	1.0969	0.0045	0.0032	0.0013	--------
22.25	2.9025	1.1002	0.0045	0.0032	0.0013	--------
22.33	2.9070	1.1034	0.0045	0.0032	0.0013	--------
22.42	2.9115	1.1066	0.0045	0.0032	0.0013	--------
22.50	2.9160	1.1098	0.0045	0.0032	0.0013	--------
22.58	2.9205	1.1130	0.0045	0.0032	0.0013	--------
22.67	2.9250	1.1163	0.0045	0.0032	0.0013	--------
22.75	2.9295	1.1195	0.0045	0.0032	0.0013	--------
22.83	2.9340	1.1227	0.0045	0.0032	0.0013	--------
22.92	2.9385	1.1260	0.0045	0.0032	0.0013	--------
23.00	2.9430	1.1292	0.0045	0.0032	0.0013	--------
23.08	2.9480	1.1328	0.0050	0.0036	0.0014	--------
23.17	2.9530	1.1364	0.0050	0.0036	0.0014	--------
23.25	2.9580	1.1400	0.0050	0.0036	0.0014	--------
23.33	2.9630	1.1436	0.0050	0.0036	0.0014	--------
23.42	2.9680	1.1472	0.0050	0.0036	0.0014	--------
23.50	2.9730	1.1508	0.0050	0.0036	0.0014	--------
23.58	2.9775	1.1541	0.0045	0.0033	0.0012	--------
23.67	2.9820	1.1573	0.0045	0.0033	0.0012	--------
23.75	2.9865	1.1606	0.0045	0.0033	0.0012	--------
23.83	2.9910	1.1639	0.0045	0.0033	0.0012	--------
23.92	2.9955	1.1671	0.0045	0.0033	0.0012	--------
24.00	3.0000	1.1704	0.0045	0.0033	0.0012	--------

Total soil rain loss = 1.83(In)
Total effective runoff = 1.17(In)

Peak flow rate this hydrograph = 0.25(CFS)
Total runoff volume this hydrograph = 4248.5(Ft3)

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24 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0000	0.00	Q	|	|	|	|
0+10	0.0000	0.00	Q	|	|	|	|
0+15	0.0000	0.00	Q	|	|	|	|
0+20	0.0000	0.00	Q	|	|	|	|
0+25	0.0000	0.00	Q	|	|	|	|
0+30	0.0000	0.00	Q	|	|	|	|
0+35	0.0000	0.00	Q	|	|	|	|
0+40	0.0000	0.00	Q	|	|	|	|
0+45	0.0000	0.00	Q	|	|	|	|
0+50	0.0000	0.00	Q	|	|	|	|
0+55	0.0000	0.00	Q	|	|	|	|
1+ 0	0.0000	0.00	Q	|	|	|	|
1+ 5	0.0000	0.00	Q	|	|	|	|
1+10	0.0000	0.00	Q	|	|	|	|
1+15	0.0000	0.00	Q	|	|	|	|
1+20	0.0000	0.00	Q	|	|	|	|
1+25	0.0000	0.00	Q	|	|	|	|
1+30	0.0000	0.00	Q	|	|	|	|
1+35	0.0000	0.00	Q	|	|	|	|
1+40	0.0000	0.00	Q	|	|	|	|
1+45	0.0000	0.00	Q	|	|	|	|
1+50	0.0000	0.00	Q	|	|	|	|
1+55	0.0000	0.00	Q	|	|	|	|
2+ 0	0.0000	0.00	Q	|	|	|	|
2+ 5	0.0000	0.00	Q	|	|	|	|
2+10	0.0000	0.00	Q	|	|	|	|
2+15	0.0000	0.00	Q	|	|	|	|
2+20	0.0000	0.00	Q	|	|	|	|
2+25	0.0000	0.00	Q	|	|	|	|
2+30	0.0000	0.00	Q	|	|	|	|
2+35	0.0000	0.00	Q	|	|	|	|
2+40	0.0000	0.00	Q	|	|	|	|
2+45	0.0000	0.00	Q	|	|	|	|
2+50	0.0000	0.00	Q	|	|	|	|
2+55	0.0000	0.00	Q	|	|	|	|
3+ 0	0.0000	0.00	Q	|	|	|	|
3+ 5	0.0000	0.00	Q	|	|	|	|
3+10	0.0000	0.00	Q	|	|	|	|
3+15	0.0000	0.00	Q	|	|	|	|
3+20	0.0000	0.00	Q	|	|	|	|
3+25	0.0000	0.00	Q	|	|	|	|
3+30	0.0000	0.00	Q	|	|	|	|
3+35	0.0000	0.00	Q	|	|	|	|
3+40	0.0000	0.00	Q	|	|	|	|
3+45	0.0000	0.00	Q	|	|	|	|

3+50	0.0000	0.00	Q				
3+55	0.0000	0.00	Q				
4+ 0	0.0000	0.00	Q				
4+ 5	0.0000	0.00	Q				
4+10	0.0000	0.00	Q				
4+15	0.0000	0.00	Q				
4+20	0.0000	0.00	Q				
4+25	0.0000	0.00	Q				
4+30	0.0000	0.00	Q				
4+35	0.0000	0.00	Q				
4+40	0.0000	0.00	Q				
4+45	0.0000	0.00	Q				
4+50	0.0000	0.00	Q				
4+55	0.0000	0.00	Q				
5+ 0	0.0000	0.00	Q				
5+ 5	0.0000	0.00	Q				
5+10	0.0000	0.00	Q				
5+15	0.0000	0.00	Q				
5+20	0.0000	0.00	Q				
5+25	0.0000	0.00	Q				
5+30	0.0000	0.00	Q				
5+35	0.0000	0.00	Q				
5+40	0.0000	0.00	Q				
5+45	0.0000	0.00	Q				
5+50	0.0000	0.00	Q				
5+55	0.0000	0.00	Q				
6+ 0	0.0000	0.00	Q				
6+ 5	0.0000	0.00	Q				
6+10	0.0000	0.00	Q				
6+15	0.0000	0.00	Q				
6+20	0.0000	0.00	Q				
6+25	0.0000	0.00	Q				
6+30	0.0000	0.00	Q				
6+35	0.0000	0.00	Q				
6+40	0.0000	0.00	Q				
6+45	0.0000	0.00	Q				
6+50	0.0000	0.00	Q				
6+55	0.0000	0.00	Q				
7+ 0	0.0000	0.00	Q				
7+ 5	0.0000	0.00	Q				
7+10	0.0000	0.00	Q				
7+15	0.0000	0.00	Q				
7+20	0.0001	0.00	Q				
7+25	0.0001	0.01	Q				
7+30	0.0001	0.01	Q				
7+35	0.0002	0.01	Q				
7+40	0.0003	0.02	Q				
7+45	0.0005	0.02	Q				
7+50	0.0007	0.03	Q				
7+55	0.0009	0.03	Q				
8+ 0	0.0011	0.03	Q				
8+ 5	0.0014	0.04	Q				
8+10	0.0018	0.06	Q				
8+15	0.0022	0.07	Q				

8+20	0.0027	0.08	QV	|	|	|	|
8+25	0.0033	0.08	QV	|	|	|	|
8+30	0.0039	0.09	QV	|	|	|	|
8+35	0.0046	0.10	QV	|	|	|	|
8+40	0.0055	0.13	Q V	|	|	|	|
8+45	0.0065	0.14	Q V	|	|	|	|
8+50	0.0076	0.16	Q V	|	|	|	|
8+55	0.0087	0.17	Q V	|	|	|	|
9+ 0	0.0100	0.18	Q V	|	|	|	|
9+ 5	0.0113	0.19	Q V	|	|	|	|
9+10	0.0127	0.21	Q V	|	|	|	|
9+15	0.0142	0.22	Q V	|	|	|	|
9+20	0.0158	0.23	Q V	|	|	|	|
9+25	0.0175	0.24	Q V	|	|	|	|
9+30	0.0192	0.25	|Q V	|	|	|	|
9+35	0.0210	0.25	|Q V	|	|	|	|
9+40	0.0226	0.24	Q V|	|	|	|	|
9+45	0.0243	0.24	Q V|	|	|	|	|
9+50	0.0259	0.24	Q V	|	|	|	|
9+55	0.0276	0.25	Q |V	|	|	|	|
10+ 0	0.0294	0.25	|Q | V	|	|	|	|
10+ 5	0.0310	0.24	Q | V	|	|	|	|
10+10	0.0322	0.17	Q | V	|	|	|	|
10+15	0.0332	0.15	Q | V	|	|	|	|
10+20	0.0341	0.14	Q | V	|	|	|	|
10+25	0.0351	0.14	Q | V	|	|	|	|
10+30	0.0360	0.14	Q | V	|	|	|	|
10+35	0.0369	0.13	Q | V	|	|	|	|
10+40	0.0376	0.10	Q | V	|	|	|	|
10+45	0.0383	0.10	Q | V	|	|	|	|
10+50	0.0389	0.09	Q | V	|	|	|	|
10+55	0.0396	0.09	Q | V	|	|	|	|
11+ 0	0.0402	0.09	Q | V	|	|	|	|
11+ 5	0.0408	0.09	Q | V	|	|	|	|
11+10	0.0414	0.08	Q | V	|	|	|	|
11+15	0.0420	0.08	Q | V	|	|	|	|
11+20	0.0425	0.08	Q | V	|	|	|	|
11+25	0.0431	0.08	Q | V	|	|	|	|
11+30	0.0436	0.08	Q | V	|	|	|	|
11+35	0.0442	0.08	Q | V	|	|	|	|
11+40	0.0447	0.08	Q | V	|	|	|	|
11+45	0.0452	0.08	Q | V	|	|	|	|
11+50	0.0457	0.08	Q | V	|	|	|	|
11+55	0.0463	0.08	Q | V	|	|	|	|
12+ 0	0.0468	0.08	Q | V|	|	|	|	|
12+ 5	0.0473	0.08	Q | V|	|	|	|	|
12+10	0.0478	0.07	Q | V|	|	|	|	|
12+15	0.0483	0.07	Q | V|	|	|	|	|
12+20	0.0488	0.07	Q | V	|	|	|	|
12+25	0.0493	0.07	Q | V	|	|	|	|
12+30	0.0498	0.07	Q | V	|	|	|	|
12+35	0.0503	0.07	Q | V	|	|	|	|
12+40	0.0508	0.07	Q | V	|	|	|	|
12+45	0.0513	0.07	Q | V	|	|	|	|

12+50	0.0518	0.07	Q	|	|	V	|	|
12+55	0.0523	0.07	Q	|	|	V	|	|
13+ 0	0.0528	0.07	Q	|	|	V	|	|
13+ 5	0.0532	0.07	Q	|	|	V	|	|
13+10	0.0537	0.07	Q	|	|	V	|	|
13+15	0.0541	0.06	Q	|	|	V	|	|
13+20	0.0546	0.06	Q	|	|	V	|	|
13+25	0.0550	0.06	Q	|	|	V	|	|
13+30	0.0555	0.06	Q	|	|	V	|	|
13+35	0.0559	0.06	Q	|	|	V	|	|
13+40	0.0563	0.06	Q	|	|	V	|	|
13+45	0.0567	0.06	Q	|	|	V	|	|
13+50	0.0572	0.06	Q	|	|	V	|	|
13+55	0.0576	0.06	Q	|	|	V	|	|
14+ 0	0.0580	0.06	Q	|	|	V	|	|
14+ 5	0.0584	0.06	Q	|	|	V	|	|
14+10	0.0589	0.07	Q	|	|	V	|	|
14+15	0.0594	0.07	Q	|	|	V	|	|
14+20	0.0599	0.07	Q	|	|	V	|	|
14+25	0.0603	0.07	Q	|	|	V	|	|
14+30	0.0608	0.07	Q	|	|	V	|	|
14+35	0.0613	0.07	Q	|	|	V	|	|
14+40	0.0616	0.05	Q	|	|	V	|	|
14+45	0.0619	0.04	Q	|	|	V	|	|
14+50	0.0622	0.04	Q	|	|	V	|	|
14+55	0.0624	0.04	Q	|	|	V	|	|
15+ 0	0.0627	0.04	Q	|	|	V	|	|
15+ 5	0.0630	0.04	Q	|	|	V	|	|
15+10	0.0634	0.06	Q	|	|	V	|	|
15+15	0.0638	0.06	Q	|	|	V	|	|
15+20	0.0642	0.06	Q	|	|	V	|	|
15+25	0.0647	0.06	Q	|	|	V	|	|
15+30	0.0651	0.06	Q	|	|	V	|	|
15+35	0.0655	0.06	Q	|	|	V	|	|
15+40	0.0659	0.06	Q	|	|	V	|	|
15+45	0.0664	0.06	Q	|	|	V	|	|
15+50	0.0668	0.06	Q	|	|	V	|	|
15+55	0.0672	0.06	Q	|	|	V	|	|
16+ 0	0.0676	0.06	Q	|	|	V	|	|
16+ 5	0.0680	0.06	Q	|	|	V	|	|
16+10	0.0684	0.06	Q	|	|	V	|	|
16+15	0.0688	0.06	Q	|	|	V	|	|
16+20	0.0692	0.06	Q	|	|	V	|	|
16+25	0.0696	0.06	Q	|	|	V	|	|
16+30	0.0700	0.06	Q	|	|	V	|	|
16+35	0.0704	0.06	Q	|	|	V	|	|
16+40	0.0708	0.06	Q	|	|	V	|	|
16+45	0.0712	0.06	Q	|	|	V	|	|
16+50	0.0716	0.06	Q	|	|	V	|	|
16+55	0.0720	0.06	Q	|	|	V	|	|
17+ 0	0.0724	0.06	Q	|	|	V	|	|
17+ 5	0.0728	0.06	Q	|	|	V	|	|
17+10	0.0732	0.05	Q	|	|	V	|	|
17+15	0.0736	0.05	Q	|	|	V	|	|

17+20	0.0739	0.05	Q	|	|	V	|
17+25	0.0742	0.05	Q	|	|	V	|
17+30	0.0746	0.05	Q	|	|	V	|
17+35	0.0749	0.05	Q	|	|	V	|
17+40	0.0753	0.05	Q	|	|	V	|
17+45	0.0756	0.05	Q	|	|	|V	|
17+50	0.0760	0.05	Q	|	|	|V	|
17+55	0.0764	0.05	Q	|	|	|V	|
18+ 0	0.0768	0.05	Q	|	|	|V	|
18+ 5	0.0771	0.05	Q	|	|	|V	|
18+10	0.0774	0.05	Q	|	|	|V	|
18+15	0.0777	0.04	Q	|	|	|V	|
18+20	0.0780	0.04	Q	|	|	|V	|
18+25	0.0783	0.04	Q	|	|	| V	|
18+30	0.0786	0.04	Q	|	|	| V	|
18+35	0.0789	0.04	Q	|	|	| V	|
18+40	0.0792	0.04	Q	|	|	| V	|
18+45	0.0794	0.04	Q	|	|	| V	|
18+50	0.0797	0.04	Q	|	|	| V	|
18+55	0.0800	0.04	Q	|	|	| V	|
19+ 0	0.0803	0.04	Q	|	|	| V	|
19+ 5	0.0806	0.04	Q	|	|	| V	|
19+10	0.0809	0.04	Q	|	|	| V	|
19+15	0.0811	0.04	Q	|	|	| V	|
19+20	0.0814	0.04	Q	|	|	| V	|
19+25	0.0816	0.04	Q	|	|	| V	|
19+30	0.0819	0.04	Q	|	|	| V	|
19+35	0.0822	0.04	Q	|	|	| V	|
19+40	0.0824	0.04	Q	|	|	| V	|
19+45	0.0827	0.04	Q	|	|	| V	|
19+50	0.0830	0.04	Q	|	|	| V	|
19+55	0.0833	0.04	Q	|	|	| V	|
20+ 0	0.0836	0.04	Q	|	|	| V	|
20+ 5	0.0839	0.04	Q	|	|	| V	|
20+10	0.0842	0.05	Q	|	|	| V	|
20+15	0.0845	0.05	Q	|	|	| V	|
20+20	0.0848	0.05	Q	|	|	| V	|
20+25	0.0852	0.05	Q	|	|	| V	|
20+30	0.0855	0.05	Q	|	|	| V	|
20+35	0.0858	0.05	Q	|	|	| V	|
20+40	0.0861	0.04	Q	|	|	| V	|
20+45	0.0864	0.04	Q	|	|	| V	|
20+50	0.0867	0.04	Q	|	|	| V	|
20+55	0.0870	0.04	Q	|	|	| V	|
21+ 0	0.0873	0.04	Q	|	|	| V	|
21+ 5	0.0876	0.04	Q	|	|	| V	|
21+10	0.0879	0.04	Q	|	|	| V	|
21+15	0.0881	0.04	Q	|	|	| V	|
21+20	0.0884	0.04	Q	|	|	| V	|
21+25	0.0887	0.04	Q	|	|	| V	|
21+30	0.0889	0.04	Q	|	|	| V	|
21+35	0.0892	0.04	Q	|	|	| V	|
21+40	0.0895	0.04	Q	|	|	| V	|
21+45	0.0897	0.04	Q	|	|	| V	|

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   21+50       0.0900      0.04  Q          |          |          |      V   |
   21+55       0.0903      0.04  Q          |          |          |       V  |
   22+ 0       0.0905      0.04  Q          |          |          |       V  |
   22+ 5       0.0908      0.04  Q          |          |          |       V  |
   22+10       0.0911      0.04  Q          |          |          |       V  |
   22+15       0.0913      0.04  Q          |          |          |       V  |
   22+20       0.0916      0.04  Q          |          |          |       V  |
   22+25       0.0919      0.04  Q          |          |          |       V  |
   22+30       0.0921      0.04  Q          |          |          |       V  |
   22+35       0.0924      0.04  Q          |          |          |       V  |
   22+40       0.0927      0.04  Q          |          |          |        V |
   22+45       0.0929      0.04  Q          |          |          |        V |
   22+50       0.0932      0.04  Q          |          |          |        V |
   22+55       0.0935      0.04  Q          |          |          |        V |
   23+ 0       0.0937      0.04  Q          |          |          |        V |
   23+ 5       0.0940      0.04  Q          |          |          |        V |
   23+10       0.0943      0.04  Q          |          |          |        V |
   23+15       0.0946      0.04  Q          |          |          |        V |
   23+20       0.0949      0.04  Q          |          |          |        V |
   23+25       0.0952      0.04  Q          |          |          |         V|
   23+30       0.0955      0.04  Q          |          |          |         V|
   23+35       0.0958      0.04  Q          |          |          |         V|
   23+40       0.0961      0.04  Q          |          |          |         V|
   23+45       0.0964      0.04  Q          |          |          |         V|
   23+50       0.0966      0.04  Q          |          |          |         V|
   23+55       0.0969      0.04  Q          |          |          |         V|
   24+ 0       0.0972      0.04  Q          |          |          |         V|
   24+ 5       0.0974      0.03  Q          |          |          |         V|
   24+10       0.0975      0.01  Q          |          |          |         V|
   24+15       0.0975      0.00  Q          |          |          |         V|
   24+20       0.0975      0.00  Q          |          |          |         V|
   24+25       0.0975      0.00  Q          |          |          |         V|
   24+30       0.0975      0.00  Q          |          |          |          V
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FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2012
Study date: 07/20/21

117.1574 IDA AVE APARTMENTS
10-YEAR STORM ROUTING

Program License Serial Number 6313

********** HYDROGRAPH INFORMATION **********

From study/file name: 1574Diff.rte
********** Hydrograph Information **********
From manual input hydrograph

**********HYDROGRAPH DATA**********

Number of intervals = 1
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 25.230 (CFS)
Total volume = 0.174 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****
++++++++++
Process from Point/Station 100.000 to Point/Station 110.000
**** RETARDING BASIN ROUTING ****

User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 1
Hydrograph time unit = 5.000 (Min.)
Initial depth in storage basin = 0.00(Ft.)

Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)

Depth vs. Storage and Depth vs. Discharge data:

Basin Depth (Ft.)	Storage (Ac.Ft)	Outflow (CFS)	(S-O*dt/2) (Ac.Ft)	(S+O*dt/2) (Ac.Ft)
0.000	0.000	0.000	0.000	0.000
1.880	0.091	0.001	0.091	0.091
3.750	0.178	0.200	0.177	0.179

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0	6.3	12.62	18.92	25.23	Depth (Ft.)
0.083	25.23	0.00	0.087	O	|	|	|	I	1.79
0.167	0.00	0.19	0.173	O	|	|	|	|	3.64
0.250	0.00	0.19	0.172	O	|	|	|	|	3.62
0.333	0.00	0.18	0.171	O	|	|	|	|	3.59
0.417	0.00	0.18	0.169	O	|	|	|	|	3.56
0.500	0.00	0.18	0.168	O	|	|	|	|	3.54
0.583	0.00	0.17	0.167	O	|	|	|	|	3.51
0.667	0.00	0.17	0.166	O	|	|	|	|	3.48
0.750	0.00	0.17	0.164	O	|	|	|	|	3.46
0.833	0.00	0.17	0.163	O	|	|	|	|	3.43
0.917	0.00	0.16	0.162	O	|	|	|	|	3.41
1.000	0.00	0.16	0.161	O	|	|	|	|	3.39
1.083	0.00	0.16	0.160	O	|	|	|	|	3.36
1.167	0.00	0.16	0.159	O	|	|	|	|	3.34
1.250	0.00	0.15	0.158	O	|	|	|	|	3.32
1.333	0.00	0.15	0.157	O	|	|	|	|	3.29
1.417	0.00	0.15	0.156	O	|	|	|	|	3.27
1.500	0.00	0.15	0.155	O	|	|	|	|	3.25
1.583	0.00	0.14	0.154	O	|	|	|	|	3.23
1.667	0.00	0.14	0.153	O	|	|	|	|	3.21
1.750	0.00	0.14	0.152	O	|	|	|	|	3.19
1.833	0.00	0.14	0.151	O	|	|	|	|	3.17
1.917	0.00	0.14	0.150	O	|	|	|	|	3.15
2.000	0.00	0.13	0.149	O	|	|	|	|	3.13
2.083	0.00	0.13	0.148	O	|	|	|	|	3.11
2.167	0.00	0.13	0.147	O	|	|	|	|	3.09
2.250	0.00	0.13	0.146	O	|	|	|	|	3.07
2.333	0.00	0.13	0.145	O	|	|	|	|	3.05
2.417	0.00	0.12	0.145	O	|	|	|	|	3.03
2.500	0.00	0.12	0.144	O	|	|	|	|	3.01
2.583	0.00	0.12	0.143	O	|	|	|	|	2.99
2.667	0.00	0.12	0.142	O	|	|	|	|	2.98
2.750	0.00	0.12	0.141	O	|	|	|	|	2.96
2.833	0.00	0.11	0.140	O	|	|	|	|	2.94
2.917	0.00	0.11	0.140	O	|	|	|	|	2.93
3.000	0.00	0.11	0.139	O	|	|	|	|	2.91
3.083	0.00	0.11	0.138	O	|	|	|	|	2.89
3.167	0.00	0.11	0.137	O	|	|	|	|	2.88
3.250	0.00	0.11	0.137	O	|	|	|	|	2.86
3.333	0.00	0.10	0.136	O	|	|	|	|	2.85
3.417	0.00	0.10	0.135	O	|	|	|	|	2.83
3.500	0.00	0.10	0.135	O	|	|	|	|	2.82
3.583	0.00	0.10	0.134	O	|	|	|	|	2.80
3.667	0.00	0.10	0.133	O	|	|	|	|	2.79
3.750	0.00	0.10	0.132	O	|	|	|	|	2.77
3.833	0.00	0.09	0.132	O	|	|	|	|	2.76
3.917	0.00	0.09	0.131	O	|	|	|	|	2.74

4.000	0.00	0.09	0.131	O	|	|	|	2.73
4.083	0.00	0.09	0.130	O	|	|	|	2.72
4.167	0.00	0.09	0.129	O	|	|	|	2.70
4.250	0.00	0.09	0.129	O	|	|	|	2.69
4.333	0.00	0.09	0.128	O	|	|	|	2.68
4.417	0.00	0.08	0.128	O	|	|	|	2.67
4.500	0.00	0.08	0.127	O	|	|	|	2.65
4.583	0.00	0.08	0.126	O	|	|	|	2.64
4.667	0.00	0.08	0.126	O	|	|	|	2.63
4.750	0.00	0.08	0.125	O	|	|	|	2.62
4.833	0.00	0.08	0.125	O	|	|	|	2.60
4.917	0.00	0.08	0.124	O	|	|	|	2.59
5.000	0.00	0.08	0.124	O	|	|	|	2.58
5.083	0.00	0.07	0.123	O	|	|	|	2.57
5.167	0.00	0.07	0.123	O	|	|	|	2.56
5.250	0.00	0.07	0.122	O	|	|	|	2.55
5.333	0.00	0.07	0.122	O	|	|	|	2.54
5.417	0.00	0.07	0.121	O	|	|	|	2.53
5.500	0.00	0.07	0.121	O	|	|	|	2.52
5.583	0.00	0.07	0.120	O	|	|	|	2.51
5.667	0.00	0.07	0.120	O	|	|	|	2.50
5.750	0.00	0.07	0.119	O	|	|	|	2.49
5.833	0.00	0.06	0.119	O	|	|	|	2.48
5.917	0.00	0.06	0.118	O	|	|	|	2.47
6.000	0.00	0.06	0.118	O	|	|	|	2.46
6.083	0.00	0.06	0.118	O	|	|	|	2.45
6.167	0.00	0.06	0.117	O	|	|	|	2.44
6.250	0.00	0.06	0.117	O	|	|	|	2.43
6.333	0.00	0.06	0.116	O	|	|	|	2.42
6.417	0.00	0.06	0.116	O	|	|	|	2.41
6.500	0.00	0.06	0.115	O	|	|	|	2.41
6.583	0.00	0.06	0.115	O	|	|	|	2.40
6.667	0.00	0.06	0.115	O	|	|	|	2.39
6.750	0.00	0.05	0.114	O	|	|	|	2.38
6.833	0.00	0.05	0.114	O	|	|	|	2.37
6.917	0.00	0.05	0.114	O	|	|	|	2.37
7.000	0.00	0.05	0.113	O	|	|	|	2.36
7.083	0.00	0.05	0.113	O	|	|	|	2.35
7.167	0.00	0.05	0.113	O	|	|	|	2.34
7.250	0.00	0.05	0.112	O	|	|	|	2.34
7.333	0.00	0.05	0.112	O	|	|	|	2.33
7.417	0.00	0.05	0.112	O	|	|	|	2.32
7.500	0.00	0.05	0.111	O	|	|	|	2.31
7.583	0.00	0.05	0.111	O	|	|	|	2.31
7.667	0.00	0.05	0.111	O	|	|	|	2.30
7.750	0.00	0.05	0.110	O	|	|	|	2.29
7.833	0.00	0.04	0.110	O	|	|	|	2.29
7.917	0.00	0.04	0.110	O	|	|	|	2.28
8.000	0.00	0.04	0.109	O	|	|	|	2.27
8.083	0.00	0.04	0.109	O	|	|	|	2.27
8.167	0.00	0.04	0.109	O	|	|	|	2.26
8.250	0.00	0.04	0.108	O	|	|	|	2.26
8.333	0.00	0.04	0.108	O	|	|	|	2.25
8.417	0.00	0.04	0.108	O	|	|	|	2.24

8.500	0.00	0.04	0.108	O	|	|	|	2.24
8.583	0.00	0.04	0.107	O	|	|	|	2.23
8.667	0.00	0.04	0.107	O	|	|	|	2.23
8.750	0.00	0.04	0.107	O	|	|	|	2.22
8.833	0.00	0.04	0.107	O	|	|	|	2.22
8.917	0.00	0.04	0.106	O	|	|	|	2.21
9.000	0.00	0.04	0.106	O	|	|	|	2.20
9.083	0.00	0.03	0.106	O	|	|	|	2.20
9.167	0.00	0.03	0.106	O	|	|	|	2.19
9.250	0.00	0.03	0.105	O	|	|	|	2.19
9.333	0.00	0.03	0.105	O	|	|	|	2.18
9.417	0.00	0.03	0.105	O	|	|	|	2.18
9.500	0.00	0.03	0.105	O	|	|	|	2.17
9.583	0.00	0.03	0.104	O	|	|	|	2.17
9.667	0.00	0.03	0.104	O	|	|	|	2.17
9.750	0.00	0.03	0.104	O	|	|	|	2.16
9.833	0.00	0.03	0.104	O	|	|	|	2.16
9.917	0.00	0.03	0.104	O	|	|	|	2.15
10.000	0.00	0.03	0.103	O	|	|	|	2.15
10.083	0.00	0.03	0.103	O	|	|	|	2.14
10.167	0.00	0.03	0.103	O	|	|	|	2.14
10.250	0.00	0.03	0.103	O	|	|	|	2.13
10.333	0.00	0.03	0.103	O	|	|	|	2.13
10.417	0.00	0.03	0.102	O	|	|	|	2.13
10.500	0.00	0.03	0.102	O	|	|	|	2.12
10.583	0.00	0.03	0.102	O	|	|	|	2.12
10.667	0.00	0.03	0.102	O	|	|	|	2.11
10.750	0.00	0.03	0.102	O	|	|	|	2.11
10.833	0.00	0.03	0.102	O	|	|	|	2.11
10.917	0.00	0.02	0.101	O	|	|	|	2.10
11.000	0.00	0.02	0.101	O	|	|	|	2.10
11.083	0.00	0.02	0.101	O	|	|	|	2.10
11.167	0.00	0.02	0.101	O	|	|	|	2.09
11.250	0.00	0.02	0.101	O	|	|	|	2.09
11.333	0.00	0.02	0.101	O	|	|	|	2.09
11.417	0.00	0.02	0.100	O	|	|	|	2.08
11.500	0.00	0.02	0.100	O	|	|	|	2.08
11.583	0.00	0.02	0.100	O	|	|	|	2.08
11.667	0.00	0.02	0.100	O	|	|	|	2.07
11.750	0.00	0.02	0.100	O	|	|	|	2.07
11.833	0.00	0.02	0.100	O	|	|	|	2.07
11.917	0.00	0.02	0.100	O	|	|	|	2.06
12.000	0.00	0.02	0.099	O	|	|	|	2.06
12.083	0.00	0.02	0.099	O	|	|	|	2.06
12.167	0.00	0.02	0.099	O	|	|	|	2.05
12.250	0.00	0.02	0.099	O	|	|	|	2.05
12.333	0.00	0.02	0.099	O	|	|	|	2.05
12.417	0.00	0.02	0.099	O	|	|	|	2.05
12.500	0.00	0.02	0.099	O	|	|	|	2.04
12.583	0.00	0.02	0.098	O	|	|	|	2.04
12.667	0.00	0.02	0.098	O	|	|	|	2.04
12.750	0.00	0.02	0.098	O	|	|	|	2.04
12.833	0.00	0.02	0.098	O	|	|	|	2.03
12.917	0.00	0.02	0.098	O	|	|	|	2.03

13.000	0.00	0.02	0.098	O	|	|	|	2.03
13.083	0.00	0.02	0.098	O	|	|	|	2.02
13.167	0.00	0.02	0.098	O	|	|	|	2.02
13.250	0.00	0.02	0.098	O	|	|	|	2.02
13.333	0.00	0.02	0.097	O	|	|	|	2.02
13.417	0.00	0.02	0.097	O	|	|	|	2.02
13.500	0.00	0.02	0.097	O	|	|	|	2.01
13.583	0.00	0.01	0.097	O	|	|	|	2.01
13.667	0.00	0.01	0.097	O	|	|	|	2.01
13.750	0.00	0.01	0.097	O	|	|	|	2.01
13.833	0.00	0.01	0.097	O	|	|	|	2.00
13.917	0.00	0.01	0.097	O	|	|	|	2.00
14.000	0.00	0.01	0.097	O	|	|	|	2.00
14.083	0.00	0.01	0.097	O	|	|	|	2.00
14.167	0.00	0.01	0.096	O	|	|	|	2.00
14.250	0.00	0.01	0.096	O	|	|	|	1.99
14.333	0.00	0.01	0.096	O	|	|	|	1.99
14.417	0.00	0.01	0.096	O	|	|	|	1.99
14.500	0.00	0.01	0.096	O	|	|	|	1.99
14.583	0.00	0.01	0.096	O	|	|	|	1.99
14.667	0.00	0.01	0.096	O	|	|	|	1.99
14.750	0.00	0.01	0.096	O	|	|	|	1.98
14.833	0.00	0.01	0.096	O	|	|	|	1.98
14.917	0.00	0.01	0.096	O	|	|	|	1.98
15.000	0.00	0.01	0.096	O	|	|	|	1.98
15.083	0.00	0.01	0.095	O	|	|	|	1.98
15.167	0.00	0.01	0.095	O	|	|	|	1.97
15.250	0.00	0.01	0.095	O	|	|	|	1.97
15.333	0.00	0.01	0.095	O	|	|	|	1.97
15.417	0.00	0.01	0.095	O	|	|	|	1.97
15.500	0.00	0.01	0.095	O	|	|	|	1.97
15.583	0.00	0.01	0.095	O	|	|	|	1.97
15.667	0.00	0.01	0.095	O	|	|	|	1.97
15.750	0.00	0.01	0.095	O	|	|	|	1.96
15.833	0.00	0.01	0.095	O	|	|	|	1.96
15.917	0.00	0.01	0.095	O	|	|	|	1.96
16.000	0.00	0.01	0.095	O	|	|	|	1.96
16.083	0.00	0.01	0.095	O	|	|	|	1.96
16.167	0.00	0.01	0.095	O	|	|	|	1.96
16.250	0.00	0.01	0.095	O	|	|	|	1.96
16.333	0.00	0.01	0.094	O	|	|	|	1.95
16.417	0.00	0.01	0.094	O	|	|	|	1.95
16.500	0.00	0.01	0.094	O	|	|	|	1.95
16.583	0.00	0.01	0.094	O	|	|	|	1.95
16.667	0.00	0.01	0.094	O	|	|	|	1.95
16.750	0.00	0.01	0.094	O	|	|	|	1.95
16.833	0.00	0.01	0.094	O	|	|	|	1.95
16.917	0.00	0.01	0.094	O	|	|	|	1.95
17.000	0.00	0.01	0.094	O	|	|	|	1.94
17.083	0.00	0.01	0.094	O	|	|	|	1.94
17.167	0.00	0.01	0.094	O	|	|	|	1.94
17.250	0.00	0.01	0.094	O	|	|	|	1.94
17.333	0.00	0.01	0.094	O	|	|	|	1.94
17.417	0.00	0.01	0.094	O	|	|	|	1.94

17.500	0.00	0.01	0.094	O	|	|	|	1.94
17.583	0.00	0.01	0.094	O	|	|	|	1.94
17.667	0.00	0.01	0.094	O	|	|	|	1.94
17.750	0.00	0.01	0.094	O	|	|	|	1.93
17.833	0.00	0.01	0.093	O	|	|	|	1.93
17.917	0.00	0.01	0.093	O	|	|	|	1.93
18.000	0.00	0.01	0.093	O	|	|	|	1.93
18.083	0.00	0.01	0.093	O	|	|	|	1.93
18.167	0.00	0.01	0.093	O	|	|	|	1.93
18.250	0.00	0.01	0.093	O	|	|	|	1.93
18.333	0.00	0.01	0.093	O	|	|	|	1.93
18.417	0.00	0.01	0.093	O	|	|	|	1.93
18.500	0.00	0.01	0.093	O	|	|	|	1.93
18.583	0.00	0.01	0.093	O	|	|	|	1.93
18.667	0.00	0.01	0.093	O	|	|	|	1.92
18.750	0.00	0.01	0.093	O	|	|	|	1.92
18.833	0.00	0.01	0.093	O	|	|	|	1.92
18.917	0.00	0.01	0.093	O	|	|	|	1.92
19.000	0.00	0.01	0.093	O	|	|	|	1.92
19.083	0.00	0.01	0.093	O	|	|	|	1.92
19.167	0.00	0.01	0.093	O	|	|	|	1.92
19.250	0.00	0.01	0.093	O	|	|	|	1.92
19.333	0.00	0.01	0.093	O	|	|	|	1.92
19.417	0.00	0.00	0.093	O	|	|	|	1.92
19.500	0.00	0.00	0.093	O	|	|	|	1.92
19.583	0.00	0.00	0.093	O	|	|	|	1.92
19.667	0.00	0.00	0.093	O	|	|	|	1.92
19.750	0.00	0.00	0.093	O	|	|	|	1.91
19.833	0.00	0.00	0.093	O	|	|	|	1.91
19.917	0.00	0.00	0.093	O	|	|	|	1.91
20.000	0.00	0.00	0.093	O	|	|	|	1.91
20.083	0.00	0.00	0.092	O	|	|	|	1.91
20.167	0.00	0.00	0.092	O	|	|	|	1.91
20.250	0.00	0.00	0.092	O	|	|	|	1.91
20.333	0.00	0.00	0.092	O	|	|	|	1.91
20.417	0.00	0.00	0.092	O	|	|	|	1.91
20.500	0.00	0.00	0.092	O	|	|	|	1.91
20.583	0.00	0.00	0.092	O	|	|	|	1.91
20.667	0.00	0.00	0.092	O	|	|	|	1.91
20.750	0.00	0.00	0.092	O	|	|	|	1.91
20.833	0.00	0.00	0.092	O	|	|	|	1.91
20.917	0.00	0.00	0.092	O	|	|	|	1.91
21.000	0.00	0.00	0.092	O	|	|	|	1.91
21.083	0.00	0.00	0.092	O	|	|	|	1.90
21.167	0.00	0.00	0.092	O	|	|	|	1.90
21.250	0.00	0.00	0.092	O	|	|	|	1.90
21.333	0.00	0.00	0.092	O	|	|	|	1.90
21.417	0.00	0.00	0.092	O	|	|	|	1.90
21.500	0.00	0.00	0.092	O	|	|	|	1.90
21.583	0.00	0.00	0.092	O	|	|	|	1.90
21.667	0.00	0.00	0.092	O	|	|	|	1.90
21.750	0.00	0.00	0.092	O	|	|	|	1.90
21.833	0.00	0.00	0.092	O	|	|	|	1.90
21.917	0.00	0.00	0.092	O	|	|	|	1.90

22.000	0.00	0.00	0.092	O	|	|	|	1.90
22.083	0.00	0.00	0.092	O	|	|	|	1.90
22.167	0.00	0.00	0.092	O	|	|	|	1.90
22.250	0.00	0.00	0.092	O	|	|	|	1.90
22.333	0.00	0.00	0.092	O	|	|	|	1.90
22.417	0.00	0.00	0.092	O	|	|	|	1.90
22.500	0.00	0.00	0.092	O	|	|	|	1.90
22.583	0.00	0.00	0.092	O	|	|	|	1.90
22.667	0.00	0.00	0.092	O	|	|	|	1.90
22.750	0.00	0.00	0.092	O	|	|	|	1.90
22.833	0.00	0.00	0.092	O	|	|	|	1.90
22.917	0.00	0.00	0.092	O	|	|	|	1.89
23.000	0.00	0.00	0.092	O	|	|	|	1.89
23.083	0.00	0.00	0.092	O	|	|	|	1.89
23.167	0.00	0.00	0.092	O	|	|	|	1.89
23.250	0.00	0.00	0.092	O	|	|	|	1.89
23.333	0.00	0.00	0.092	O	|	|	|	1.89
23.417	0.00	0.00	0.092	O	|	|	|	1.89
23.500	0.00	0.00	0.092	O	|	|	|	1.89
23.583	0.00	0.00	0.092	O	|	|	|	1.89
23.667	0.00	0.00	0.092	O	|	|	|	1.89
23.750	0.00	0.00	0.092	O	|	|	|	1.89
23.833	0.00	0.00	0.092	O	|	|	|	1.89
23.917	0.00	0.00	0.091	O	|	|	|	1.89
24.000	0.00	0.00	0.091	O	|	|	|	1.89
24.083	0.00	0.00	0.091	O	|	|	|	1.89
24.167	0.00	0.00	0.091	O	|	|	|	1.89
24.250	0.00	0.00	0.091	O	|	|	|	1.89
24.333	0.00	0.00	0.091	O	|	|	|	1.89
24.417	0.00	0.00	0.091	O	|	|	|	1.89
24.500	0.00	0.00	0.091	O	|	|	|	1.89
24.583	0.00	0.00	0.091	O	|	|	|	1.89
24.667	0.00	0.00	0.091	O	|	|	|	1.89
24.750	0.00	0.00	0.091	O	|	|	|	1.89
24.833	0.00	0.00	0.091	O	|	|	|	1.89
24.917	0.00	0.00	0.091	O	|	|	|	1.89
25.000	0.00	0.00	0.091	O	|	|	|	1.89
25.083	0.00	0.00	0.091	O	|	|	|	1.89
25.167	0.00	0.00	0.091	O	|	|	|	1.89
25.250	0.00	0.00	0.091	O	|	|	|	1.89
25.333	0.00	0.00	0.091	O	|	|	|	1.89
25.417	0.00	0.00	0.091	O	|	|	|	1.89
25.500	0.00	0.00	0.091	O	|	|	|	1.89
25.583	0.00	0.00	0.091	O	|	|	|	1.89
25.667	0.00	0.00	0.091	O	|	|	|	1.88
25.750	0.00	0.00	0.091	O	|	|	|	1.88
25.833	0.00	0.00	0.091	O	|	|	|	1.88
25.917	0.00	0.00	0.091	O	|	|	|	1.88
26.000	0.00	0.00	0.091	O	|	|	|	1.88
26.083	0.00	0.00	0.091	O	|	|	|	1.88
26.167	0.00	0.00	0.091	O	|	|	|	1.88
26.250	0.00	0.00	0.091	O	|	|	|	1.88
26.333	0.00	0.00	0.091	O	|	|	|	1.88
26.417	0.00	0.00	0.091	O	|	|	|	1.88

26.500	0.00	0.00	0.091	O	|	|	|	| 1.88
26.583	0.00	0.00	0.091	O	|	|	|	| 1.88
26.667	0.00	0.00	0.091	O	|	|	|	| 1.88
26.750	0.00	0.00	0.091	O	|	|	|	| 1.88
26.833	0.00	0.00	0.091	O	|	|	|	| 1.88
26.917	0.00	0.00	0.091	O	|	|	|	| 1.88
27.000	0.00	0.00	0.091	O	|	|	|	| 1.88
27.083	0.00	0.00	0.091	O	|	|	|	| 1.88
27.167	0.00	0.00	0.091	O	|	|	|	| 1.88
27.250	0.00	0.00	0.091	O	|	|	|	| 1.88
27.333	0.00	0.00	0.091	O	|	|	|	| 1.88
27.417	0.00	0.00	0.091	O	|	|	|	| 1.88
27.500	0.00	0.00	0.091	O	|	|	|	| 1.88
27.583	0.00	0.00	0.091	O	|	|	|	| 1.88
27.667	0.00	0.00	0.091	O	|	|	|	| 1.88
27.750	0.00	0.00	0.091	O	|	|	|	| 1.88
27.833	0.00	0.00	0.091	O	|	|	|	| 1.88
27.917	0.00	0.00	0.091	O	|	|	|	| 1.88

Remaining water in basin = 0.09 (Ac.Ft)

**********HYDROGRAPH DATA**********

Number of intervals = 335
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 0.189 (CFS)
Total volume = 0.083 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

ATTACHMENT 3
Structural BMP Maintenance Information

This is the cover sheet for Attachment 3.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	**Contents**	**Checklist**
Attachment 3a	Structural BMP Maintenance Thresholds and Actions (Required)	☒ Included See Structural BMP Maintenance Information Checklist on the back of this Attachment cover sheet.
Attachment 3b	Draft Maintenance Agreement (when applicable)	☐ Included ☐ Not Applicable

Use this checklist to ensure the required information has been included in the Structural BMP Maintenance Information Attachment:

☒ **Preliminary Design / Planning / CEQA level submittal:**

Attachment 3a must identify:

- ☒ Typical maintenance indicators and actions for proposed structural BMP(s) based on Section 7.7 of the BMP Design Manual

Attachment 3b is not required for preliminary design / planning / CEQA level submittal.

☐ **Final Design level submittal:**

Attachment 3a must identify:

- ☐ Specific maintenance indicators and actions for proposed structural BMP(s). This shall be based on Section 7.7 of the BMP Design Manual and enhanced to reflect actual proposed components of the structural BMP(s)
- ☐ How to access the structural BMP(s) to inspect and perform maintenance
- ☐ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
- ☐ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
- ☐ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
- ☐ Recommended equipment to perform maintenance
- ☐ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management

Attachment 3b: For private entity operation and maintenance, Attachment 3b shall include a draft maintenance agreement in the local jurisdiction's standard format (PDP applicant to contact the City Engineer to obtain the current maintenance agreement forms).

Filterra® Maintenance Steps



1. Inspection of Filterra and surrounding area



2. Removal of tree grate and erosion control stones



3. Removal of debris, trash and mulch



4. Mulch replacement



5. Clean area around Filterra



6. Complete paperwork and record plant height and width

For additional information please contact your local Filterra sales representative.
Eastern Zone: 866-349-3458, Western Zone: 877-345-1450.

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Operation & Maintenance (OM) Manual v01

filterra®

Bioretention Systems

CONTECH®

ENGINEERED SOLUTIONS

filterra®
Bioretention Systems

Table of Contents

Overview

- Filterra® General Description
- Filterra® Schematic
- Basic Operations
- Design

Maintenance

- Maintenance Overview
  - » Why Maintain?
  - » When to Maintain?
- Exclusion of Services
- Maintenance Visit Summary
- Maintenance Tools, Safety Equipment and Supplies
- Maintenance Visit Procedure
- Maintenance Checklist

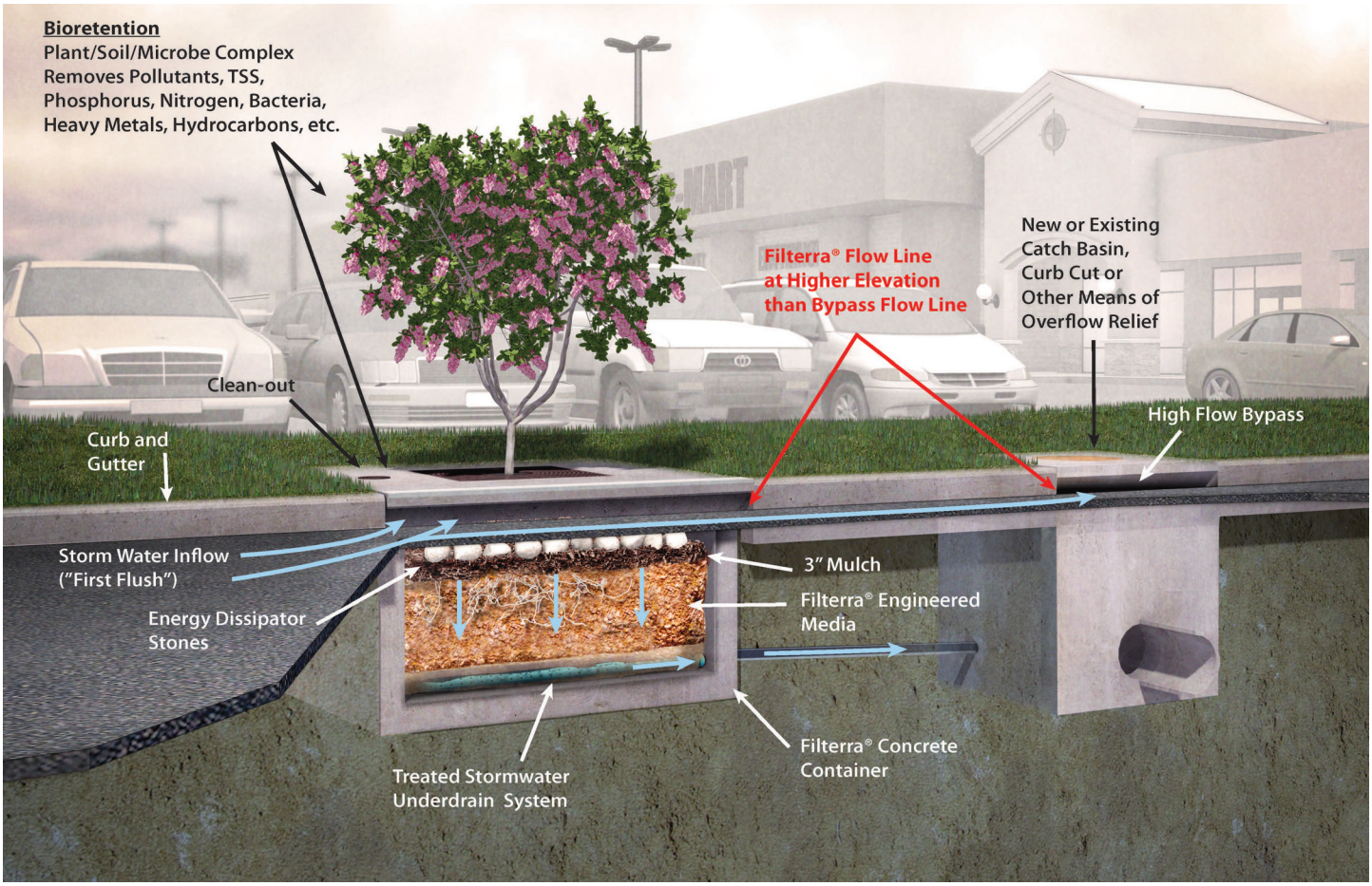
Resources

- *Example Filterra Project Maintenance Report Sheet*
- *Example Filterra Structure Maintenance Report Sheet*
- Filterra® Warranty
- *Drawing FTST-2: Filterra Standard Configuration Detail*
- *Drawing FTNL-3: Filterra Narrow Length Configuration Detail*
- *Drawing FTNW-3: Filterra Narrow Width Configuration Detail*

CONTECH®
ENGINEERED SOLUTIONS

General Description

The following general specifications describe the general operations and maintenance requirements for the Contech Engineered Solutions LLC stormwater bioretention filtration system, the Filterra®. The system utilizes physical, chemical and biological mechanisms of a soil, plant and microbe complex to remove pollutants typically found in urban stormwater runoff. The treatment system is a fully equipped, pre-constructed drop-in place unit designed for applications in the urban landscape to treat contaminated runoff.



Stormwater flows through a specially designed filter media mixture contained in a landscaped concrete container. The mixture immobilizes pollutants which are then decomposed, volatilized and incorporated into the biomass of the Filterra® system's micro/macro fauna and flora. Stormwater runoff flows through the media and into an underdrain system at the bottom of the container, where the treated water is discharged. Higher flows bypass the Filterra® to a downstream inlet or outfall. Maintenance is a simple, inexpensive and safe operation that does not require confined space access, pumping or vacuum equipment or specialized tools. Properly trained landscape personnel can effectively maintain Filterra® Stormwater systems by following instructions in this manual.

Basic Operations

Filterra® is a bioretention system in a concrete box. Contaminated stormwater runoff enters the filter box through the curb inlet spreading over the 3-inch layer of mulch on the surface of the filter media. As the water passes through the mulch layer, most of the larger sediment particles and heavy metals are removed through sedimentation and chemical reactions with the organic material in the mulch. Water passes through the soil media where the finer particles are removed and other chemical reactions take place to immobilize and capture pollutants in the soil media. The cleansed water passes into an underdrain and flows to a pipe system or other appropriate discharge point. Once the pollutants are in the soil, the bacteria begin to break down and metabolize the materials and the plants begin to uptake and metabolize the pollutants. Some pollutants such as heavy metals, which are chemically bound to organic particles in the mulch, are released over time as the organic matter decomposes to release the metals to the feeder roots of the plants and the cells of the bacteria in the soil where they remain and are recycled. Other pollutants such as phosphorus are chemically bound to the soil particles and released slowly back to the plants and bacteria and used in their metabolic processes. Nitrogen goes through a very complex variety of biochemical processes where it can ultimately end up in the plant/bacteria biomass, turned to nitrogen gas or dissolves back into the water column as nitrates depending on soil temperature, pH and the availability of oxygen. The pollutants ultimately are retained in the mulch, soil and biomass with some passing out of the system into the air or back into the water.

Design and Installation

Each project presents different scopes for the use of Filterra® systems. To ensure the safe and specified function of the stormwater BMP, Contech reviews each application before supply. Information and help may be provided to the design engineer during the planning process. Correct Filterra® box sizing (by rainfall region) is essential to predict pollutant removal rates for a given area. The engineer shall submit calculations for approval by the local jurisdiction. The contractor is responsible for the correct installation of Filterra units as shown in approved plans. A comprehensive installation manual is available at www.conteches.com.

Maintenance

Why Maintain?

All stormwater treatment systems require maintenance for effective operation. This necessity is often incorporated in your property's permitting process as a legally binding BMP maintenance agreement.

- Avoid legal challenges from your jurisdiction's maintenance enforcement program.
- Prolong the expected lifespan of your Filterra media.
- Avoid more costly media replacement.
- Help reduce pollutant loads leaving your property.

Simple maintenance of the Filterra® is required to continue effective pollutant removal from stormwater runoff before discharge into downstream waters. This procedure will also extend the longevity of the living biofilter system. The unit will recycle and accumulate pollutants within the biomass, but is also subjected to other materials entering the throat. This may include trash, silt and leaves etc. which will be contained within the void below the top grate and above the mulch layer. Too much silt may inhibit the Filterra's® flow rate, which is the reason for site stabilization before activation. Regular replacement of the mulch stops accumulation of such sediment.

When to Maintain?

Contech includes a 1-year maintenance plan with each system purchase. Annual included maintenance consists of a maximum of two (2) scheduled visits. Additional maintenance may be necessary depending on sediment and trash loading (by Owner or at additional cost). The start of the maintenance plan begins when the system is activated for full operation. Full operation is defined as the unit installed, curb and gutter and transitions in place and activation (by Supplier) when mulch and plant are added and temporary throat protection removed.

Activation cannot be carried out until the site is fully stabilized (full landscaping, grass cover, final paving and street sweeping completed). Maintenance visits are scheduled seasonally; the spring visit aims to clean up after winter loads including salts and sands while the fall visit helps the system by removing excessive leaf litter.

It has been found that in regions which receive between 30-50 inches of annual rainfall, (2) two visits are generally required; regions with less rainfall often only require (1) one visit per annum. Varying land uses can affect maintenance frequency; e.g. some fast food restaurants require more frequent trash removal. Contributing drainage areas which are subject to new development wherein the recommended erosion and sediment control measures have not been implemented may require additional maintenance visits.

Some sites may be subjected to extreme sediment or trash loads, requiring more frequent maintenance visits. This is the reason for detailed notes of maintenance actions per unit, helping the Supplier and Owner predict future maintenance frequencies, reflecting individual site conditions.

Owners must promptly notify the (maintenance) Supplier of any damage to the plant(s), which constitute(s) an integral part of the bioretention technology. Owners should also advise other landscape or maintenance contractors to leave all maintenance to the Supplier (i.e. no pruning or fertilizing).

Exclusion of Services

It is the responsibility of the owner to provide adequate irrigation when necessary to the plant of the Filterra® system.

Clean up due to major contamination such as oils, chemicals, toxic spills, etc. will result in additional costs and are not covered under the Supplier maintenance contract. Should a major contamination event occur the Owner must block off the outlet pipe of the Filterra® (where the cleaned runoff drains to, such as drop inlet) and block off the throat of the Filterra®. The Supplier should be informed immediately.

Maintenance Visit Summary

Each maintenance visit consists of the following simple tasks (detailed instructions below).

1. Inspection of Filterra® and surrounding area
2. Removal of tree grate and erosion control stones
3. Removal of debris, trash and mulch
4. Mulch replacement
5. Plant health evaluation and pruning or replacement as necessary
6. Clean area around Filterra®
7. Complete paperwork

Maintenance Tools, Safety Equipment and Supplies

Ideal tools include: camera, bucket, shovel, broom, pruners, hoe/rake, and tape measure. Appropriate Personal Protective Equipment (PPE) should be used in accordance with local or company procedures. This may include impervious gloves where the type of trash is unknown, high visibility clothing and barricades when working in close proximity to traffic and also safety hats and shoes. A T-Bar or crowbar should be used for moving the tree grates (up to 170 lbs ea.). Most visits require minor trash removal and a full replacement of mulch. See below for actual number of bagged mulch that is required in each unit size. Mulch should be a double shredded, hardwood variety; do not use colored or dyed mulch. Some visits may require additional Filterra® engineered soil media available from the Supplier.

Box Length	Box Width	Filter Surface Area (ft^2)	Volume at 3″ (ft^3)	# of 2 ft^3 Mulch Bags
4	4	4	4	2
6	4	6	6	3
8	4	8	8	4
6	6	9	9	5
8	6	12	12	6
10	6	15	15	8
12	6	18	18	9
13	7	23	23	12

Maintenance Visit Procedure

Keep sufficient documentation of maintenance actions to predict location specific maintenance frequencies and needs. An example Maintenance Report is included in this manual.



1. Inspection of Filterra® and surrounding area

- Record individual unit before maintenance with photograph (numbered). Record on Maintenance Report (see example in this document) the following:

Record on Maintenance Report the following:

Standing Water	yes | no
Damage to Box Structure	yes | no
Damage to Grate	yes | no
Is Bypass Clear	yes | no

If yes answered to any of these observations, record with close-up photograph (numbered).



2. Removal of tree grate and erosion control stones

- Remove cast iron grates for access into Filterra® box.
- Dig out silt (if any) and mulch and remove trash & foreign items.

Record on Maintenance Report the following:

Silt/Clay	yes | no
Cups/ Bags	yes | no
Leaves	yes | no
# of Buckets Removed	_____



3. Removal of debris, trash and mulch

- After removal of mulch and debris, measure distance from the top of the Filterra® engineered media soil to the bottom of the top slab. If this distance is greater than 12", add Filterra® media (not top soil or other) to recharge to a 9" distance

Record on Maintenance Report the following:

Distance of Bottom of Top Slab (inches)	_____
# of Buckets of Media Added	_____



4. Mulch replacement

- Please see mulch specifications.
- Add double shredded mulch evenly across the entire unit to a depth of 3".
- Ensure correct repositioning of erosion control stones by the Filterra® inlet to allow for entry of trash during a storm event.
- Replace Filterra® grates correctly using appropriate lifting or moving tools, taking care not to damage the plant.



5. Plant health evaluation and pruning or replacement as necessary

- Examine the plant's health and replace if dead.
- Prune as necessary to encourage growth in the correct directions

Record on Maintenance Report the following:

Height above Grate	(Feet)
Width at Widest Point	(feet)
Health	alive | dead
Damage to Plant	yes | no
Plant Replaced	yes | no



6. Clean area around Filterra®

- Clean area around unit and remove all refuse to be disposed of appropriately.



7. Complete paperwork

- Deliver Maintenance Report and photographs to appropriate location (normally Contech during maintenance contract period).
- Some jurisdictions may require submission of maintenance reports in accordance with approvals. It is the responsibility of the Owner to comply with local regulations.

Maintenance Checklist

Drainage System Failure	Problem	Conditions to Check	Condition that Should Exist	Actions
Inlet	Excessive sediment or trash accumulation.	Accumulated sediments or trash impair free flow of water into Filterra.	Inlet should be free of obstructions allowing free distributed flow of water into Filterra.	Sediments and/or trash should be removed.
Mulch Cover	Trash and floatable debris accumulation.	Excessive trash and/or debris accumulation.	Minimal trash or other debris on mulch cover.	Trash and debris should be removed and mulch cover raked level. Ensure bark nugget mulch is not used.
Mulch Cover	"Ponding" of water on mulch cover.	"Ponding" in unit could be indicative of clogging due to excessive fine sediment accumulation or spill of petroleum oils.	Stormwater should drain freely and evenly through mulch cover.	Recommend contact manufacturer and replace mulch as a minimum.
Vegetation	Plants not growing or in poor condition.	Soil/mulch too wet, evidence of spill. Incorrect plant selection. Pest infestation. Vandalism to plants.	Plants should be healthy and pest free.	Contact manufacturer for advice.
Vegetation	Plant growth excessive.	Plants should be appropriate to the species and location of Filterra.		Trim/prune plants in accordance with typical landscaping and safety needs.
Structure	Structure has visible cracks.	Cracks wider than 1/2 inch or evidence of soil particles entering the structure through the cracks.		Vault should be repaired.
Maintenance is ideally to be performed twice annually.				

CONTECH®
ENGINEERED SOLUTIONS

StormTech®
Detention • Retention • Water Quality
An ADS company

Isolator® Row O&M Manual







THE MOST **ADVANCED** NAME IN WATER MANAGEMENT SOLUTIONS™

ADS®

THE ISOLATOR® ROW

INTRODUCTION

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The StormTech Isolator Row is a technique to inexpensively enhance Total Suspended Solids (TSS) removal and provide easy access for inspection and maintenance.

THE ISOLATOR ROW

The Isolator Row is a row of StormTech chambers, either SC-160LP, SC-310, SC-310-3, SC-740, DC-780, MC-3500 or MC-4500 models, that is surrounded with filter fabric and connected to a closely located manhole for easy access. The fabric-wrapped chambers provide for settling and filtration of sediment as storm water rises in the Isolator Row and ultimately passes through the filter fabric. The open bottom chambers and perforated sidewalls (SC-310, SC- 310-3 and SC-740 models) allow storm water to flow both vertically and horizontally out of the chambers. Sediments are captured in the Isolator Row protecting the storage areas of the adjacent stone and chambers from sediment accumulation.

Two different fabrics are used for the Isolator Row. A woven geotextile fabric is placed between the stone and the Isolator Row chambers. The tough geotextile provides a media for storm water filtration and provides a durable surface for maintenance operations. It is also designed to prevent scour of the underlying stone and remain intact during high pressure jetting. A non-woven fabric is placed over the chambers to provide a filter media for flows passing through the perforations in the sidewall of the chamber. The non-woven fabric is not required over the SC-160LP, DC-780, MC-3500 or MC-4500 models as these chambers do not have perforated side walls.

The Isolator Row is typically designed to capture the “first flush” and offers the versatility to be sized on a volume basis or flow rate basis. An upstream manhole not only provides access to the Isolator Row but typically includes a high flow weir such that storm water flowrates or volumes that exceed the capacity of the Isolator Row overtop the over flow weir and discharge through a manifold to the other chambers.

The Isolator Row may also be part of a treatment train. By treating storm water prior to entry into the chamber system, the service life can be extended and pollutants such as hydrocarbons can be captured. Pre-treatment best management practices can be as simple as deep sump catch basins, oil-water separators or can be innovative storm water treatment devices. The design of the treatment train and selection of pretreatment devices by the design engineer is often driven by regulatory requirements. Whether pretreatment is used or not, the Isolator Row is recommended by StormTech as an effective means to minimize maintenance requirements and maintenance costs.

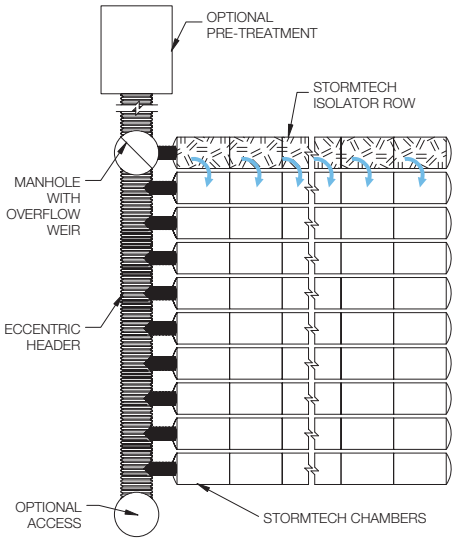
Note: See the StormTech Design Manual for detailed information on designing inlets for a StormTech system, including the Isolator Row.



Looking down the Isolator Row from the manhole opening, woven geotextile is shown between the chamber and stone base.



StormTech Isolator Row with Overflow Spillway (not to scale)





ISOLATOR ROW INSPECTION/MAINTENANCE

INSPECTION

The frequency of inspection and maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial, residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices.

At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

The Isolator Row incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 3 inches throughout the length of the Isolator Row, clean-out should be performed.

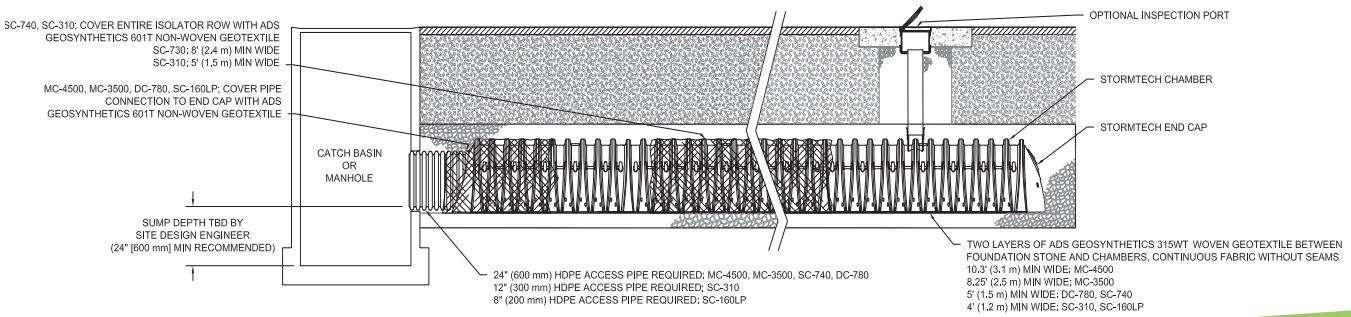
MAINTENANCE

The Isolator Row was designed to reduce the cost of periodic maintenance. By "isolating" sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entries.

Maintenance is accomplished with the JetVac process. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45" are best. Most JetVac reels have 400 feet of hose allowing maintenance of an Isolator Row up to 50 chambers long. **The JetVac process shall only be performed on StormTech Isolator Rows that have AASHTO class 1 woven geotextile (as specified by StormTech) over their angular base stone.**

StormTech Isolator Row (not to scale)

Note: Non-woven fabric is only required over the inlet pipe connection into the end cap for SC-160LP, DC-780, MC-3500 and MC-4500 chamber models and is not required over the entire Isolator Row.



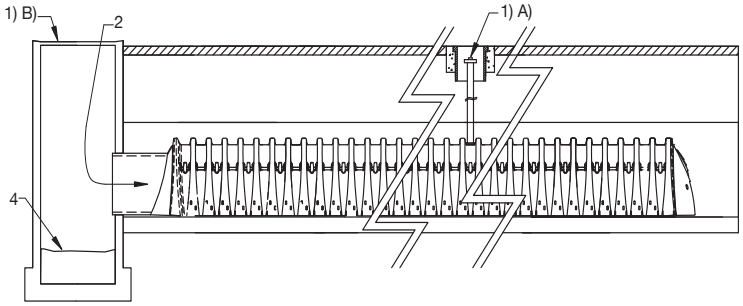
ISOLATOR ROW STEP BY STEP MAINTENANCE PROCEDURES

STEP 1
Inspect Isolator Row for sediment.
- A) Inspection ports (if present)
  - i. Remove lid from floor box frame
  - ii. Remove cap from inspection riser
  - iii. Using a flashlight and stadia rod,measure depth of sediment and record results on maintenance log.
  - iv. If sediment is at or above 3 inch depth, proceed to Step 2. If not, proceed to Step 3.
- B) All Isolator Rows
  - i. Remove cover from manhole at upstream end of Isolator Row
  - ii. Using a flashlight, inspect down Isolator Row through outlet pipe
    1. Mirrors on poles or cameras may be used to avoid a confined space entry
    2. Follow OSHA regulations for confined space entry if entering manhole
  - iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches), proceed to Step 2. If not, proceed to Step 3.

STEP 2
Clean out Isolator Row using the JetVac process.
- A) A fixed floor cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable
- B) Apply multiple passes of JetVac until backflush water is clean
- C) Vacuum manhole sump as required

STEP 3
Replace all caps, lids and covers, record observations and actions.

STEP 4
Inspect & clean catch basins and manholes upstream of the StormTech system.



SAMPLE MAINTENANCE LOG

Date	Stadia Rod Readings		Sediment Depth (1)–(2)	Observations/Actions	Inspector
	Fixed point to chamber bottom (1)	Fixed point to top of sediment (2)			
3/15/11	6.3 ft	none		New installation. Fixed point is CI frame at grade	DJM
9/24/11		6.2	0.1 ft	Some grit felt	SM
6/20/13		5.8	0.5 ft	Mucky feel, debris visible in manhole and in Isolator Row, maintenance due	NV
7/7/13	6.3 ft		0	System jetted and vacuumed	DJM

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StormTech® Detention • Retention • Water Quality
A division of ADS®

Advanced Drainage Systems, Inc.
4640 Trueman Blvd., Hilliard, OH 43026
1-800-821-6710 www.ads-pipe.com

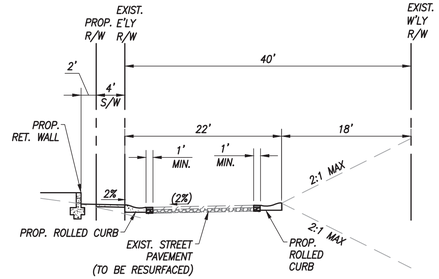
ATTACHMENT 4
Copy of Plan Sheets Showing Permanent Storm Water BMPs

This is the cover sheet for Attachment 4.

Use this checklist to ensure the required information has been included on the plans:

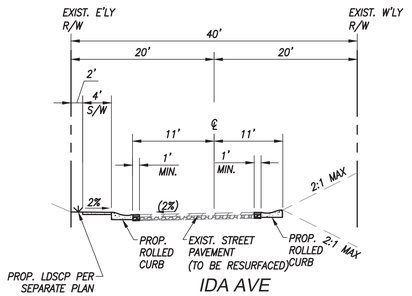
The plans must identify:

☒ Structural BMP(s) with ID numbers matching Form 4 Summary of PDP Structural BMPs
☒ The grading and drainage design shown on the plans must be consistent with the delineation of DMAs shown on the DMA exhibit
☐ Details and specifications for construction of structural BMP(s)
☐ Signage indicating the location and boundary of structural BMP(s) as required by the City Engineer
☐ How to access the structural BMP(s) to inspect and perform maintenance
☐ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
☐ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
☐ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
☐ Recommended equipment to perform maintenance
☐ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management
☐ Include landscaping plan sheets showing vegetation requirements for vegetated structural BMP(s)
☐ All BMPs must be fully dimensioned on the plans
☐ When proprietary BMPs are used, site-specific cross section with outflow, inflow, and model number shall be provided. Photocopies of general brochures are not acceptable.
☐ A single plan BMP sheet for each construction drawing highlighting only those BMPs included in the referenced construction drawing. (See Section 5.5.2 of the City's JRMP for further detail.)



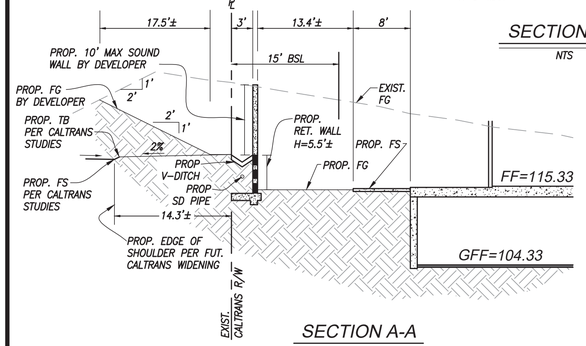
IDA AVE STREET SECTION (NORTH OF UNIT 7)

NTS



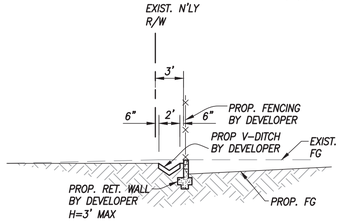
IDA AVE STREET SECTION (UNITS 1-7)

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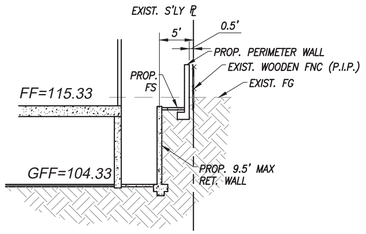
SECTION A-A

NTS



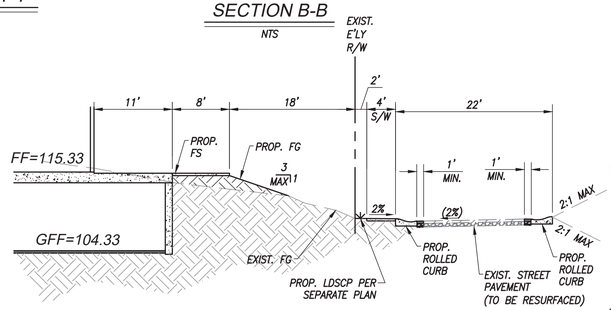
SECTION F-F

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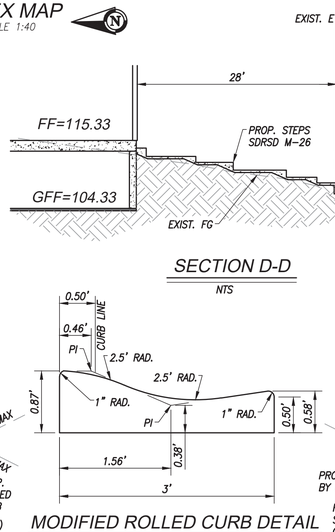
SECTION B-B

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SECTION C-C

NTS



MODIFIED ROLLED CURB DETAIL

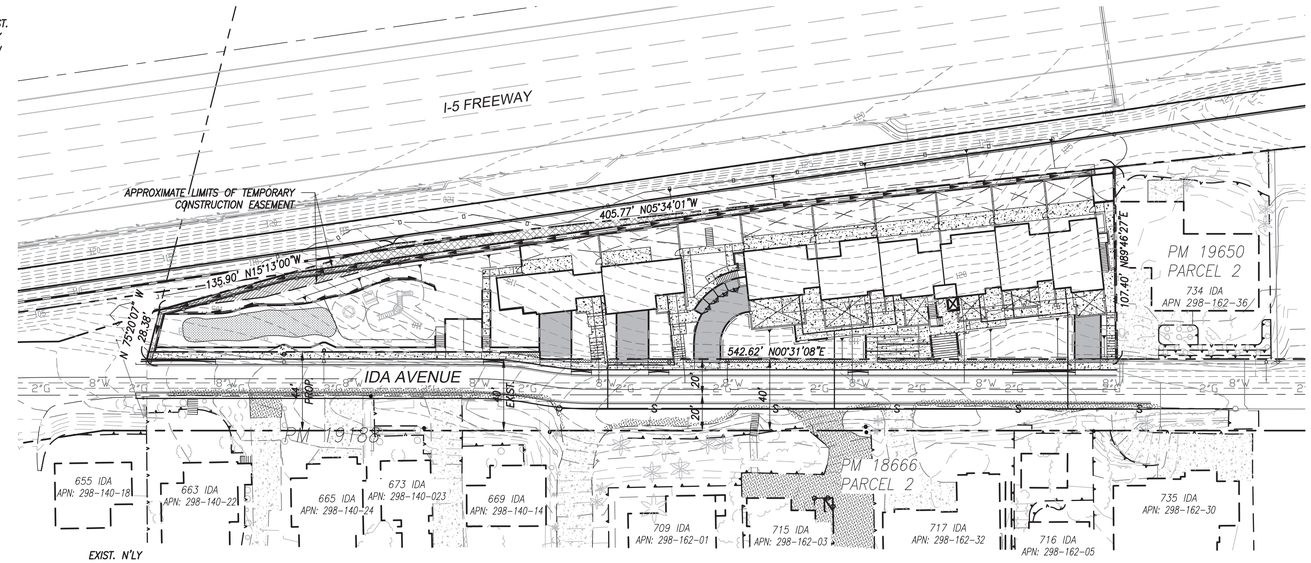
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FILTERRA DETAIL

NTS

STORMWATER RETENTION FACILITY DETAIL

NTS



INDEX MAP

SCALE 1:40

SECTION D-D

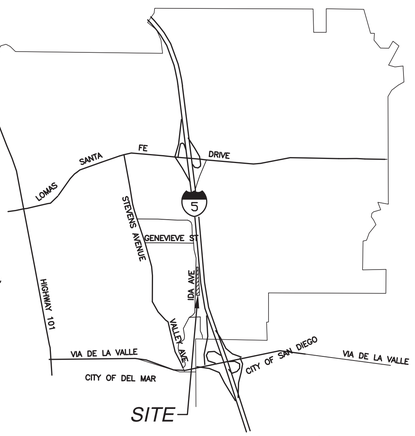
NTS

SECTION E-E

NTS

SECTION F-F

NTS



VICINITY MAP

NTS

LEGEND

- PROP. AC
- PROP. PCC
- PROP. LDSCP
- TEMPORARY CONSTRUCTION EASEMENT
- R/W
- ℄
- AC JOIN LINE
- (100) EXIST. CONTOUR
- W EXIST. WATER (SIZE PER PLAN)
- S EXIST. SEWER (SIZE PER PLAN)
- G EXIST. GAS (SIZE PER PLAN)
- EXIST. GUTTER
- EXIST. CURB
- 100 PROP. INDEX CONTOUR
- PROP. INTERMEDIATE CONTOUR
- PROP. CURB
- PROP. GUTTER
- PROP. RET. WALL
- PROP. PERIMETER WALL
- FS FINISH SURFACE
- FS FINISH GRADE
- TS TOP OF STEP
- TW TOP OF WALL
- BSL BUILDING SETBACK LINE

TOP OF SLOPE
PROP. EXIST.
TOE OF SLOPE

OWNERS:

SHANTU PATEL
C/O KNN MANAGEMENT LLC
1280 HOOVER STREET
CARLSBAD, CALIFORNIA 92008
PHONE: (790) 214-8558
shantumd@gmail.com

ENGINEER:

ARMSTRONG & BROOKS CONSULTING ENGINEERS
1350 CHASE DRIVE CORONA, CA. 92881
PH. (951) 372-8400
FAX (951) 372-8430

ZONING

MHRd

ASSESSOR'S PARCEL NOS.

298-162-37

SITE ACREAGE

GROSS ACREAGE:	0.94	AC
NET ACREAGE:	0.89	AC

EARTHWORK (RAW QTYS)

RAW CUT	8,945	CU YD
RAW FILL	235	CU YD
TOTAL RAW EXPORT:	8,710	CU YD
CUT FOR FOOTINGS	106	CU YD
FILL FOR FOOTINGS	21	CU YD
TOTAL RAW EXPORT:	85	CU YD
NET EXPORT:	8,795	CU YD

OVEREX (REMOVALS/RECOMPACTION)

WALLS	894	CU YD
BLDG	1,839	CU YD
REMOVALS/RECOMPACTION:	2,733	CU YD

MAX INCREASE IN EXIST. GRADE: 4'
MAX DECREASE IN EXIST. GRADE: 20'

LEGAL DESCRIPTION

PARCEL 3 OF PM 19650, IN THE CITY OF SOLANA BEACH, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, FEBRUARY 4, 2005

BASIS OF BEARING

THE BASIS OF BEARING FOR THIS MAP IS NAD 83, ZONE 6 GRID BEARING BETWEEN MONUMENT NO. 2005 (N 1,940,417.755 E 6,251,714.612) AND NO. 2007 (N 1,937,541.494, E 6,253,036.581) PER RECORD OR SURVEY NO. 18971.
BEARING: S 24°41'03" E

BENCHMARK

THE BASIS OF ELEVATION FOR THIS SURVEY IS A FOUND 2.5" CITY OF SOLANA BEACH BRASS DISC ON CONCRETE DRAINAGE INLET AT THE EAST END OF FRESCA COURT.
INDEX #2005 NAME: SOLB-5
ELEVATION = 104.952

SHEET INDEX

TITLE SHEET	1
CONCEPTUAL GRADING PLAN	2
COMPOSITE UTILITY PLAN & DRIVEWAY PROFILES	3
WALL PROFILE	4

PREPARED BY:

ARMSTRONG & BROOKS CONSULTING ENGINEERS
PLANNING - INFRASTRUCTURE - SITE DEVELOPMENT - WATER RESOURCES
1350 E. CHASE DRIVE - CORONA - CA - 92881
P: 951 - 372 - 8400 F: 951 - 372 - 8430

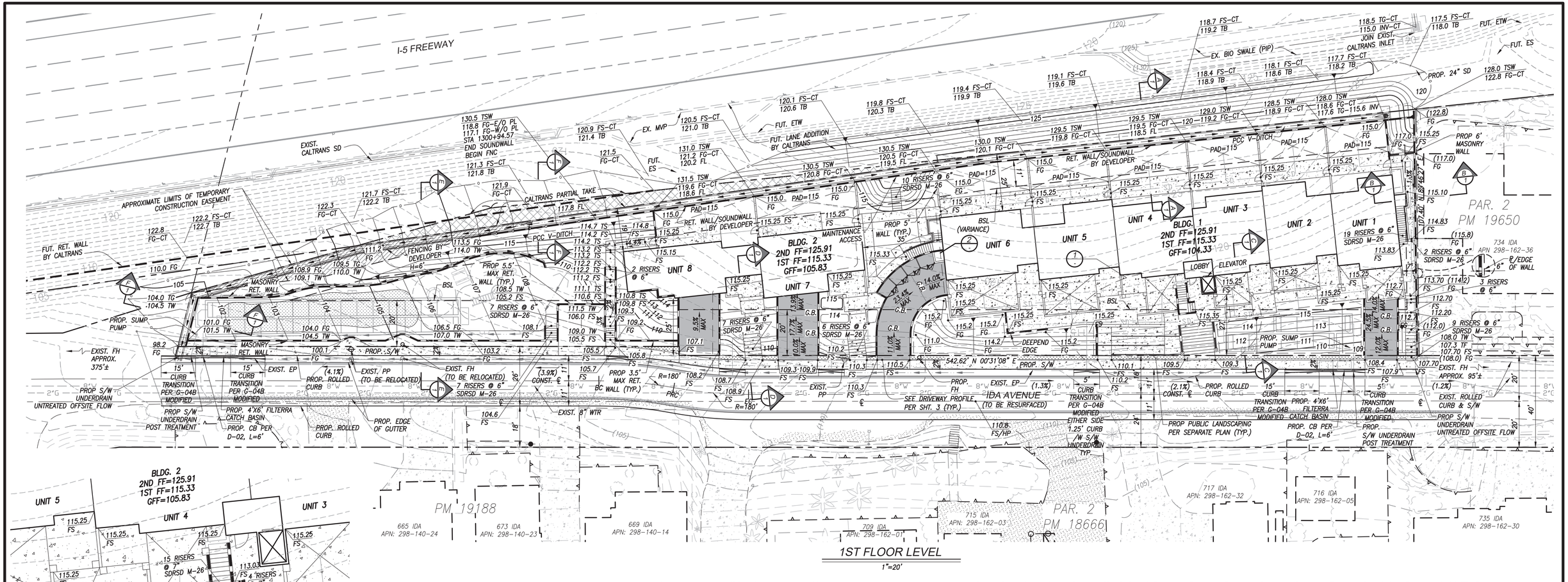
REGISTERED PROFESSIONAL ENGINEER DENNIS G. ARMSTRONG No.C48758 Exp. 9/30/22 CIVIL STATE OF CALIFORNIA

CITY OF SOLANA BEACH

CONCEPTUAL GRADING PLAN
TITLE SHEET

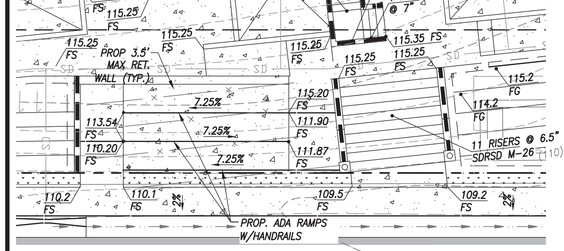
SHEET 1 OF 4

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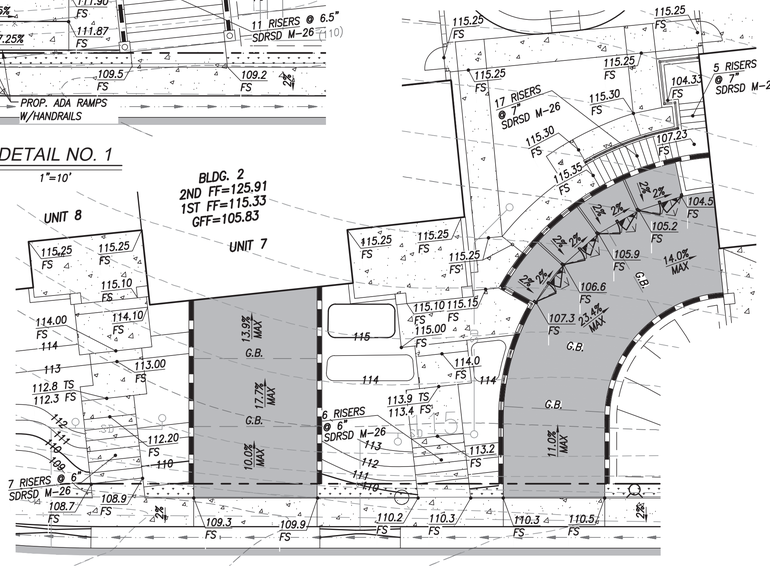
1ST FLOOR LEVEL

1"=20'



DETAIL NO. 1

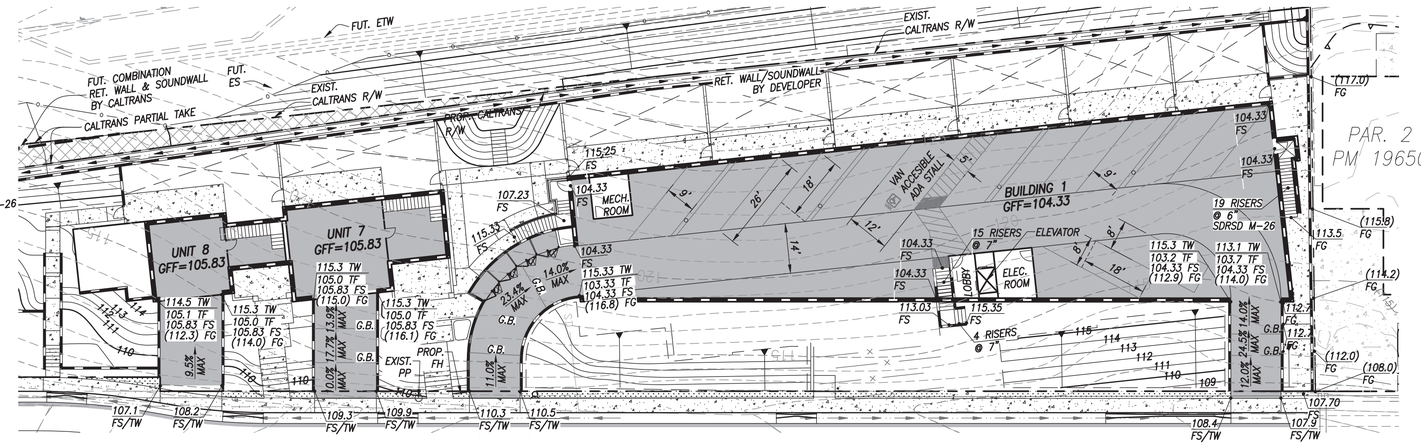
1"=10'



DETAIL NO. 2

1"=10'

SEE DRIVEWAY PROFILES SHT. 3 (TYP.)



GARAGE LEVEL

1"=20'

SEE DRIVEWAY PROFILES SHT. 3 (TYP.)

SCALE 1" = 20'

PREPARED BY:

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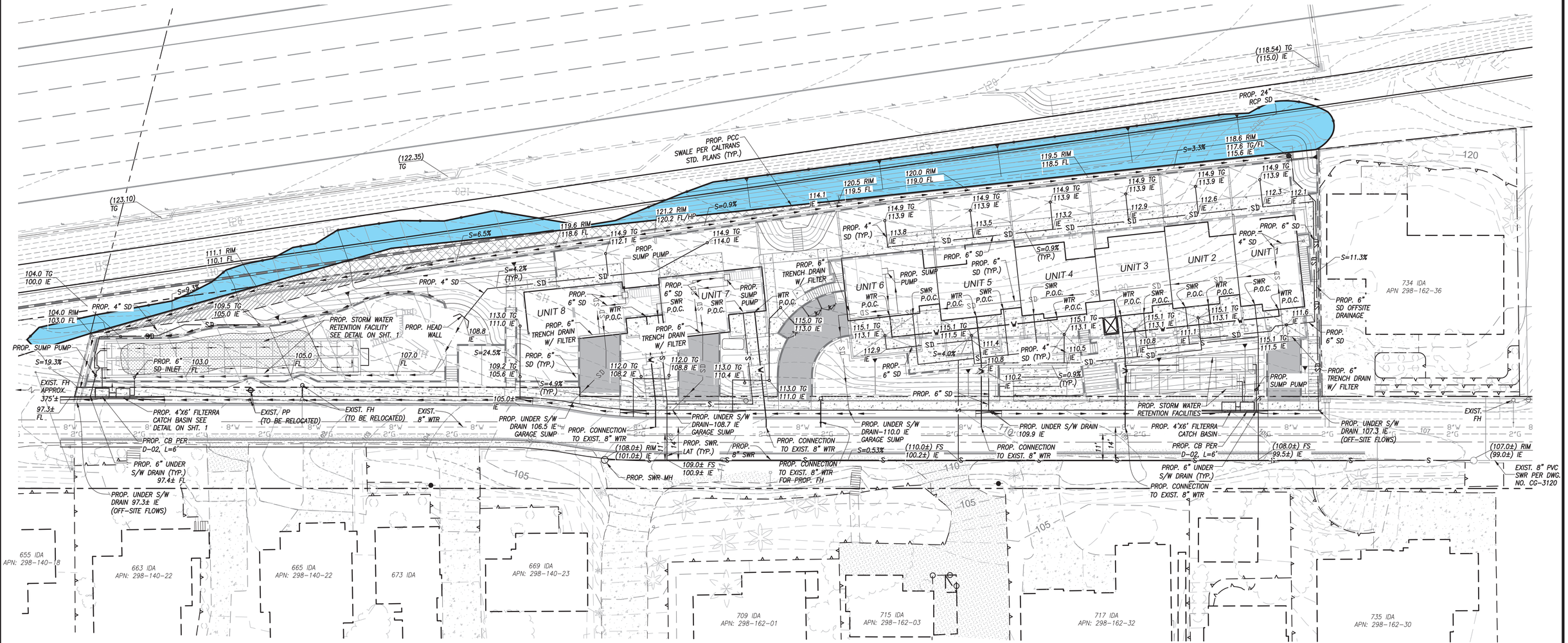
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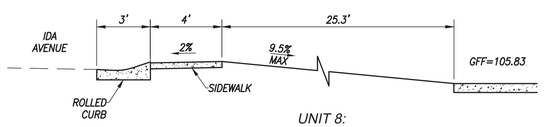
CITY OF SOLANA BEACH

CONCEPTUAL GRADING PLAN
GRADING PLAN

SHEET 2 OF 4

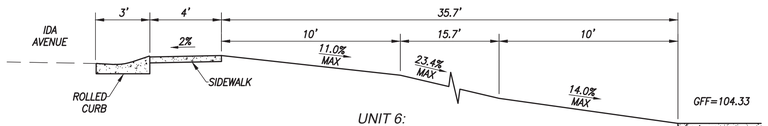
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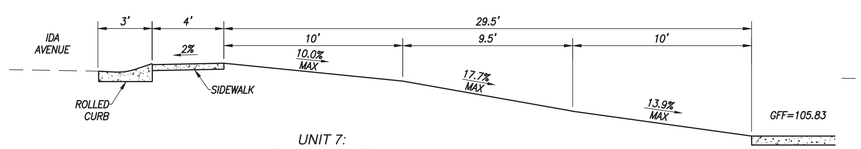
UNIT 8: DWY PROFILE

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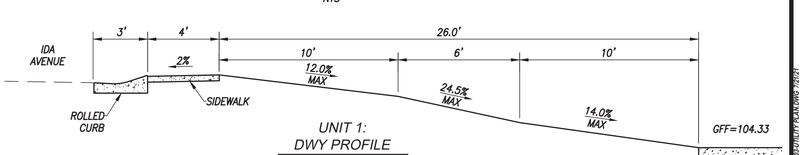
UNIT 6: DWY PROFILE

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UNIT 7: DWY PROFILE

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UNIT 1: DWY PROFILE

NTS



SCALE 1" = 20'

PREPARED BY:

ARMSTRONG & BROOKS CONSULTING ENGINEERS

PLANNING - INFRASTRUCTURE - SITE DEVELOPMENT - WATER RESOURCES

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CITY OF SOLANA BEACH

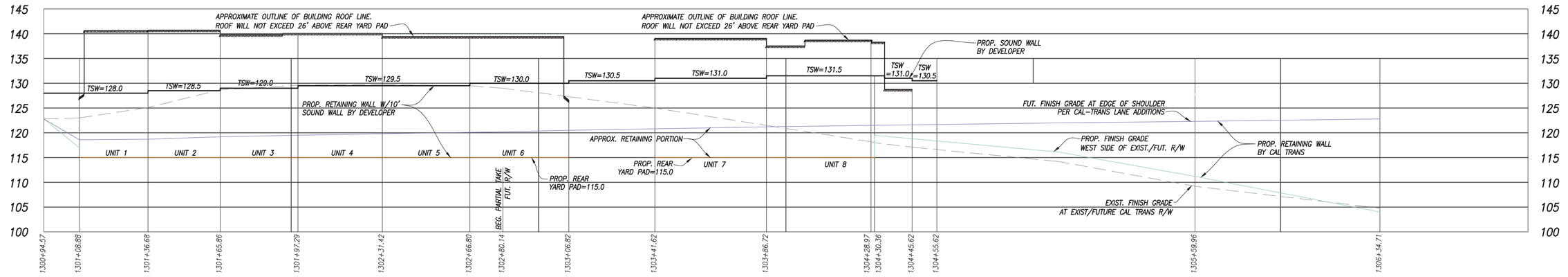
CONCEPTUAL GRADING PLAN

UTILITY PLAN & DRIVEWAY PROFILES

SHEET 3

OF 4

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WALL PROFILE – VIEW WEST FROM INTERSTATE 5

SCALE: 1" = 20' HORIZONTAL
1" = 10' VERTICAL

20 0 20 40

SCALE 1" = 20'

PREPARED BY:

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CITY OF SOLANA BEACH

CONCEPTUAL GRADING PLAN

WALL PROFILE

SHEET 4
OF 4

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Appendix E
Noise Technical Report

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Noise Technical Report
for the
Ida Avenue Project
City of Solana Beach, California

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FEBRUARY 2021

Printed on 30% post-consumer recycled material.

Table of Contents

SECTION		PAGE NO.
ACRONYMS AND ABBREVIATIONS		III
1	INTRODUCTION AND BACKGROUND	1
2	REGULATORY SETTING	7
3	EXISTING CONDITIONS	11
4	THRESHOLDS OF SIGNIFICANCE	15
5	IMPACT DISCUSSION	16
6	MITIGATION MEASURES	23
7	SUMMARY OF FINDINGS	25
8	REFERENCES CITED	27

FIGURES

1	Project Location	3
2	Site Plan	5
3	Noise Measurement and Modeling Locations	13

TABLES

1	City of Solana Beach Exterior Noise Standards	8
2	Measured Baseline Outdoor Noise Levels	11
3	Typical Construction Equipment Maximum Noise Levels	16
4	Estimated Distances between Construction Activities and the Nearest Noise-sensitive Receptors	17
5	Predicted Construction Noise Levels per Activity Phase	17
6	Off-site Roadway Traffic Noise Modeling Results	19
7	On-Site Roadway Traffic Noise Modeling Results	20

APPENDICES

A	Baseline Noise Measurement Field Data
B	Construction Noise Modeling Input and Output
C	Traffic Noise Modeling Input and Output
D	HVAC Operational Noise Model Worksheet

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Acronyms and Abbreviations

Acronym/Abbreviation	Definition
Ida Avenue Project	proposed project
Caltrans	California Department of Transportation
City	City of Oceanside
CNEL	Community Noise Equivalent Level
CNMP	construction noise management plan
dB	decibel
dBA	A-weighted decibel
FTA	Federal Transit Administration
ips	inches per second
L_{dn}	day–night average noise level
L_{eq}	equivalent noise level
L_{max}	maximum sound level
L_{min}	minimum sound level
PPV	peak particle velocity
RCNM	Roadway Construction Noise Model

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1 Introduction and Background

This technical noise report evaluates the potential noise impacts during construction and operation of the proposed Ida Avenue Project (proposed project). Land uses that generally surround the project site include single-family residences to the west and south.

Project Description

The project site is located along the east side of Ida Avenue in the City of Solana Beach (City) in San Diego County, California. The 0.94-acre site is generally located immediately west of Interstate 5, separated from the freeway by an existing narrow earthen berm of decreasing height to the north where 0.50 acres of temporary off-site grading will occur in the Caltrans Right of Way. The project site is located north of the 734 Ida Avenue property (Figure 1, Project Location). The Pacific Ocean is approximately 1.05 miles to the west. The project involves the construction of an 8-unit apartment development and associated parking (Figure 2, Site Plan).

Noise Characteristics

Sound is mechanical energy transmitted by pressure waves in a compressible medium, such as air. Noise is defined as sound that is loud, unpleasant, unexpected, or undesired. The sound pressure level (SPL) has become the most common descriptor used to characterize the loudness of an ambient sound level. The unit of measurement of sound pressure is a decibel (dB). Under controlled conditions in an acoustics laboratory, the trained, healthy human ear is able to discern changes in sound levels of 1 dB when exposed to steady, single-frequency signals in the mid-frequency range. Outside such controlled conditions, the trained ear can detect changes of 2 dB in normal environmental noise. It is widely accepted that the average healthy ear, however, can barely perceive noise level changes of 3 dB. A change of 5 dB is readily perceptible, and an upward change of 10 dB is perceived as twice as loud (Caltrans 2013a). A doubling of sound energy results in a 3 dB increase in sound, which means that a doubling of sound energy (e.g., doubling the number of ground vehicle daily trips along a given road segment) would result in a barely perceptible change in sound level.

Sound may be described in terms of level or amplitude (measured in dB), frequency or pitch (measured in hertz [Hz] or cycles per second), and duration (measured in seconds or minutes). Because the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale is used to relate noise to human sensitivity. The A-weighted decibel (dBA) scale performs this compensation by discriminating against low and very high frequencies in a manner approximating the sensitivity of the human ear.

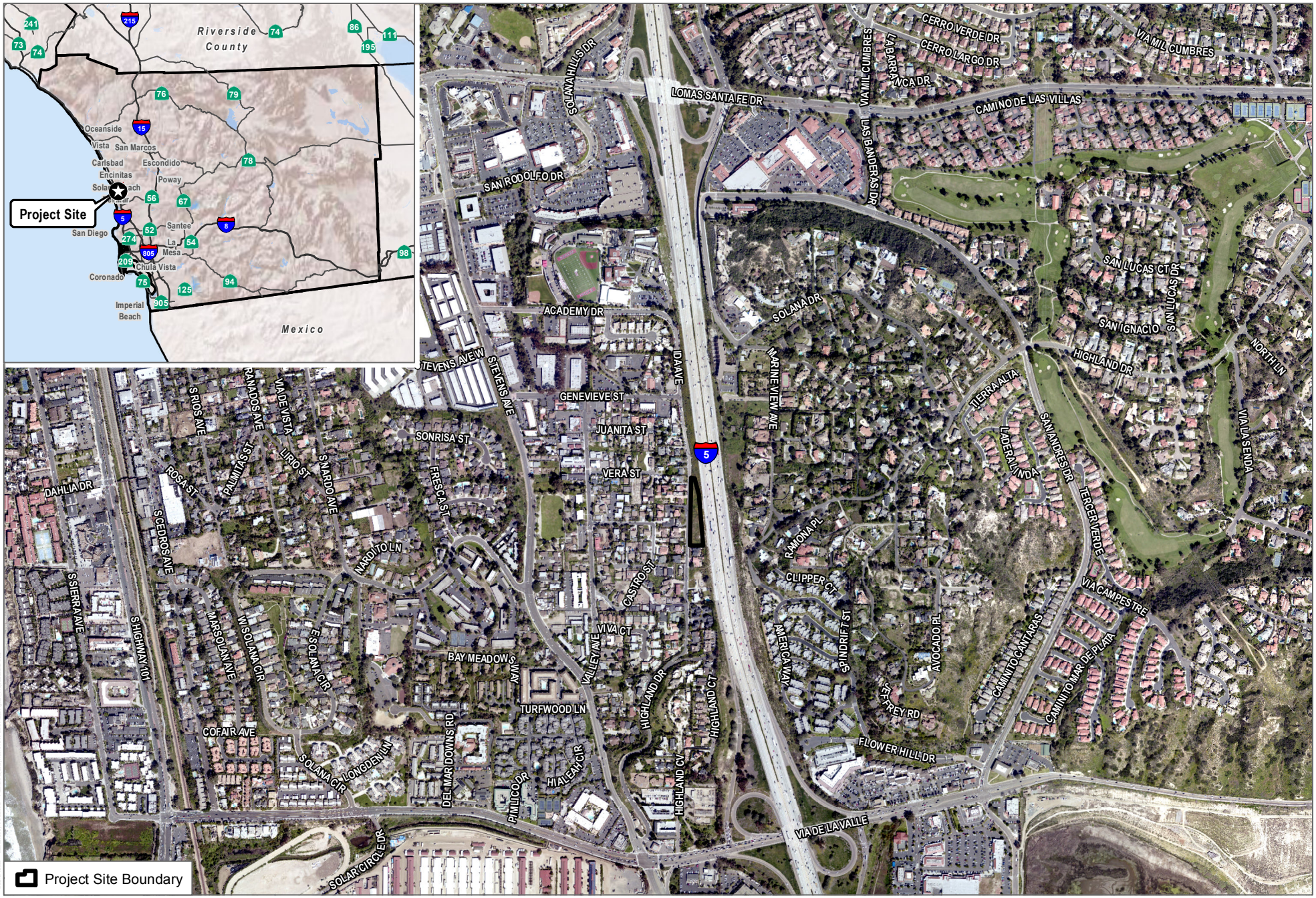
Several descriptors of noise (noise metrics) exist to help predict average community reactions to the adverse effects of environmental noise, including traffic-generated noise. These descriptors include the equivalent noise level over a given period (L_{eq}), the day–night average noise level (L_{dn}), and the community noise equivalent level (CNEL). Each of these descriptors uses units of dBA.

L_{eq} is a decibel quantity that represents the constant or energy-averaged value equivalent to the amount of variable sound energy received by a receptor during a time interval. For example, a 1-hour L_{eq} measurement of 60 dBA would represent the average amount of energy contained in all the noise that occurred in that hour. L_{eq} is an effective noise descriptor because of its ability to assess the total time-varying effects of noise on sensitive receptors, which can then be compared to an established L_{eq} standard or threshold of the same duration. Another descriptor is maximum sound level (L_{max}), which is the greatest sound level measured during a designated time interval or event. The minimum sound level (L_{min}) is often called the *floor* of a measurement period.

Unlike the L_{eq}, L_{max}, and L_{min} metrics, L_{dn} and CNEL descriptors always represent 24-hour periods and differ from a 24-hour L_{eq} value because they apply a time-weighted factor designed to emphasize noise events that occur during the non-daytime hours (when speech and sleep disturbance is of more concern). *Time-weighted* refers to the fact that L_{dn} and CNEL penalize noise that occurs during certain sensitive periods. In the case of CNEL, noise occurring during the daytime (7:00 a.m. to 7:00 p.m.) receives no penalty. Noise during the evening (7:00 p.m. to 10:00 p.m.) is penalized by adding 5 dB, and nighttime (10:00 p.m. to 7:00 a.m.) noise is penalized by adding 10 dB. L_{dn} differs from CNEL in that the daytime period is longer (defined instead as 7:00 a.m. to 10:00 p.m.), thus eliminating the dB adjustment for the evening period. L_{dn} and CNEL are the predominant criteria used to measure roadway noise affecting residential receptors. These two metrics generally differ from one another by no more than 0.5–1 dB, and are often considered or actually defined as being essentially equivalent by many jurisdictions.

Vibration Fundamentals

Vibration is oscillatory movement of mass (typically a solid) over time. It is described in terms of frequency and amplitude and, unlike sound, can be expressed as displacement, velocity, or acceleration. For environmental studies, vibration is often studied as a velocity that, akin to the discussion of sound pressure levels, can also be expressed in dB as a way to cast a large range of quantities into a more convenient scale. Vibration impacts to buildings are generally discussed in terms of inches per second (ips) peak particle velocity (PPV), which will be used herein to discuss vibration levels for ease of reading and comparison with relevant standards. Vibration can also be annoying and thereby impact occupants of structures, and vibration of sufficient amplitude can disrupt sensitive equipment and processes (Caltrans 2013b), such as those involving the use of electron microscopes and lithography equipment. Common sources of vibration within communities include construction activities and railroads. Groundborne vibration generated by construction projects is usually highest during pile driving, rock blasting, soil compacting, jack hammering, and demolition-related activities where sudden releases of subterranean energy or powerful impacts of tools on hard materials occur. Depending on their distances to a sensitive receptor, operation of large bulldozers, graders, loaded dump trucks, or other heavy construction equipment and vehicles on a construction site also have the potential to cause high vibration amplitudes. The maximum vibration level standard used by the California Department of Transportation (Caltrans) for the prevention of structural damage to typical residential buildings is 0.3 ips PPV (Caltrans 2013b).



SOURCE: SANGIS 2017

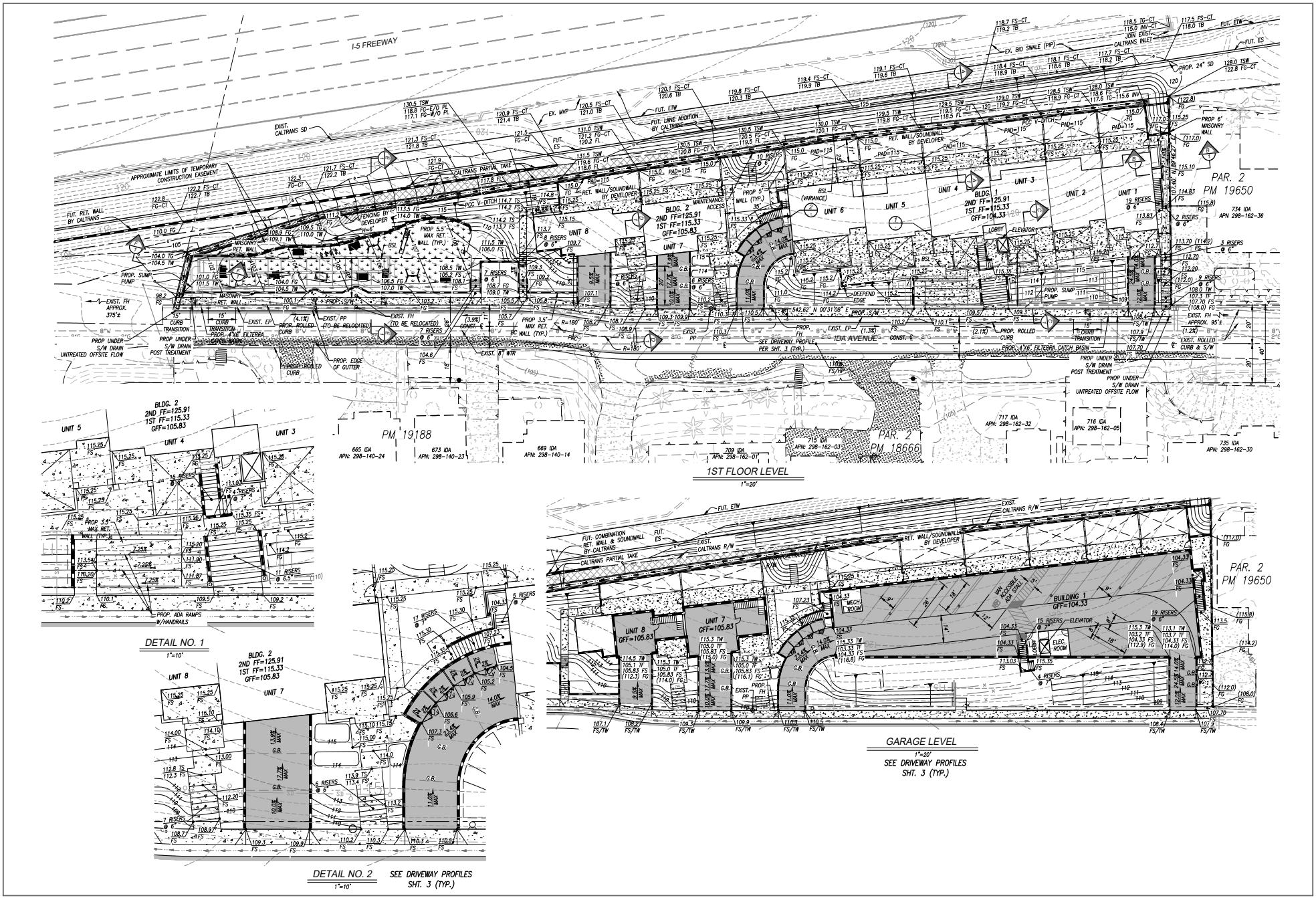
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FIGURE 1

Project Location

Noise Technical Report for the Ida Avenue Project

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SOURCE: Chereskin Architecture 2018

FIGURE 2

Site Plan

Noise Technical Report for the Ida Avenue Project

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2 Regulatory Setting

Regulatory Setting

State

California Code of Regulations, Title 24

Title 24 of the California Code of Regulations sets standards that new development in California must meet. According to Title 24 (Part 2, Volume 1, Chapter 12 – Interior Environment, Section 1206.4), interior noise levels attributed to exterior noise sources are not to exceed 45 dBA CNEL for any habitable rooms.

California Department of Health Services Guidelines

The California Department of Health Services has developed guidelines of community noise acceptability for use by local agencies (OPR 2003). Selected relevant levels are listed here:

- Below 60 dBA CNEL: normally acceptable for low-density residential use
- 50 to 70 dBA: conditionally acceptable for low-density residential use
- Below 65 dBA CNEL: normally acceptable for high-density residential use and transient lodging
- 60 to 70 dBA CNEL: conditionally acceptable for high-density residential, transient lodging, churches, educational, and medical facilities

The normally acceptable exterior noise level for high-density residential use is up to 65 dBA CNEL. Conditionally acceptable exterior noise levels range up to 70 dBA CNEL for high-density residential use.

California Department of Transportation

In its Transportation and Construction Vibration Guidance Manual, Caltrans recommends a vibration velocity threshold of 0.2 ips PPV (Caltrans 2013b) for assessing annoying vibration impacts to occupants of residential structures. Although this Caltrans guidance is not a regulation, it can serve as a quantified standard in the absence of such limits at the local jurisdictional level. Similarly, thresholds to assess building damage risk due to construction vibration vary with the type of structure and its fragility, but tend to range between 0.2 ips and 0.3 ips PPV for typical residential structures (Caltrans 2013b).

Local

General Plan Noise Element Policies

The City's Noise Element outlines general goals, objectives, and relevant noise policies that include the following:

- Establish a community noise standard that specifies acceptable limits of noise for various land uses throughout the City
- Establish measures by to control noise impacts from transportation related noise sources
- Establish measures to control impacts from non-transportation noise sources
- Integrate the adopted community noise ordinance and related considerations into the city's ongoing land use planning process

In a manner similar to the state's land use planning guidelines, the City's Noise Element also features a policy recommendation (Policy 1) that puts attention to the careful planning of future residents in areas subjected to noise levels of 65 dBA or higher (City of Solana Beach 1988).

For interior noise, the Noise Element also refers to an earlier version of the California Title 24 noise insulation standard: 45 dBA CNEL as the maximum acceptable level for inhabited rooms when exterior noise levels are 60 dBA CNEL or more. This implies that if windows and doors are required to be closed to meet this standard, then mechanical ventilation (i.e., air conditioning) shall be included in the project design.

City of Solana Beach Noise Ordinance

Sound limits for stationary (point) sources are normally included in the Noise Ordinance of a regulating agency. The City of Solana Beach, in Chapter 7.34 of the City's Municipal Codes has established a set of guidelines which include hourly sound limits for various stationary sources (such as roof-top mechanical equipment). Section 7.34.040 of Solana Beach Municpal Code (SBMC) includes average hourly sound level (L_{eqh}) limits which are established for various land zones.

The hourly average sound limit (L_{eqh}) for medium-density residential zones in Solana Beach is 55 dB during daytime hours (i.e., 7 am to 10 pm) and 45 dB during nighttime hours (i.e., 10 pm and 7 am) as shown in Table 1.

Table 1. City of Solana Beach Exterior Noise Standards

Zone	Applicable Limit (decibels)	Time Period
Residential (ER1, ER2, LR, LMR, MR)	50 45	7:00 a.m. to 9:59 p.m. 10:00 p.m. to 6:59 a.m.
Residential (MHR, HR)	55 45	7:00 a.m. to 9:59 p.m. 10:00 p.m. to 6:59 a.m.
Commercial (C, LC, OP)	60 55	7:00 a.m. to 9:59 p.m. 10:00 p.m. to 6:59 a.m.
Industrial (LI, SC)	70 60	7:00 a.m. to 9:59 p.m. 10:00 p.m. to 6:59 a.m.
Public/Institutional (PI, ROW)	60 45	7:00 a.m. to 9:59 p.m. 10:00 p.m. to 6:59 a.m.
Park/Recreational (OSR)	60 45	7:00 a.m. to 9:59 p.m. 10:00 p.m. to 6:59 a.m.

Source: Solana Beach Municipal Code, Section 7.34.040.

Construction-Related Noise Standards

The anticipated noise levels during the construction phase of the project must comply with the City of Solana Beach's Noise Ordinance, as established in Section 7.34.100 of City's Municipal Codes, which reads as follows:

> *A. The erection, demolition, alteration or repair of any building structure or the grading or excavation of land in such a manner as to create disturbing, excessive, or offensive noise during the following hours, except as hereinafter provided, is a violation of this code:*
>
> > *1. Before 7:00 a.m. or after 7:00 p.m., Monday through Friday, and before 8:00 a.m. or after 7:00 p.m. on Saturday;*

2. All day on Sunday, New Year's Day, Martin Luther King Day, President's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, and Christmas Day.

B. Exceptions.

1. An owner/occupant or resident/tenant of residential property may engage in home improvement or a home construction project involving the erection, demolition, alteration or repair of a building or structure or the grading or excavation of land on any weekday between the hours of 7:00 a.m. and 7:00 p.m., and on weekends between the hours of 8:00 a.m. and 7:00 p.m.; provided such project is for the benefit of the residential property and is personally carried out by said owner/occupant or resident/tenant

2. The city manager may grant exceptions of this section by issuing a permit in the following circumstances:

a. When emergency repairs are required to protect the health and safety of any member of the community;

b. In nonresidential zones, provided there are not inhabited dwellings within 1,500 feet of the building or structure being erected, demolished, altered, or repaire

C. Construction noise levels shall not exceed 75 decibels for more than eight hours [L_{eq} (8)] during any 24-hour period when measured at or within property lines of any property which is developed and used either in part or in whole for residential purposes.

In the event that lower noise limit standards are established for such construction activity pursuant to state or federal law, such lower limits shall be used as a basis for revising and amending the noise level limits specified in subsection C of this section. (Ord. 147 § 1, 1991)

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3 Existing Conditions

SPL measurements were conducted near the project site on January 10, 2020, to quantify and characterize the existing outdoor noise levels. Table 2 provides the location, date, and time at which these baseline noise level measurements were taken. The SPL measurements were performed by an attending Dudek field investigator using a Rion NL-52 sound level meter equipped with a 0.5-inch, pre-polarized condenser microphone with pre-amplifier. The sound level meter meets the current American National Standards Institute standard for a Type 1 (Precision Grade) sound level meter (SLM). The accuracy of the SLM was verified using a reference sound signal (i.e., field calibrator) before and after the measurements, and the measurements were conducted with the microphone positioned approximately 5 feet above the ground.

Three short-term noise level measurement locations (ST1–ST3) that represent the vicinities of existing sensitive receivers were selected on and near the project site. These locations are depicted as receivers ST1–ST3 on Figure 3, Noise Measurement and Modeling Locations. The L_{eq} and L_{max} noise levels are provided in Table 2. The primary noise sources at the sites identified in Table 2 consisted of freeway traffic along adjacent Interstate 5, the sounds of leaves rustling, and birdsong. As shown in Table 2, the measured sound levels ranged from approximately 59.1 dBA L_{eq} at ST1 to 71.2 dBA L_{eq} at ST3. The measured range of these L_{eq} values is consistent with the ST locations, their proximity to Interstate 5 traffic, and the presence of sound-path occlusion afforded by the intervening earthen berm that forms the eastern edge of the project site. Noise measurement data is also included in Appendix A, Baseline Noise Measurement Field Data. These samples of daytime L_{eq} measured at the three receptor positions in Table 2 can be interpreted as approximations of CNEL, since evening SPL would likely be 5 dBA less, and nighttime SPL would be 10 dBA less than the daytime values (FTA 2006).

Table 2. Measured Baseline Outdoor Noise Levels

Receptor	Location/Address	Date (dd.mm.yy)	Time (hh:mm)	L_{eq} (dBA)	L_{max} (dBA)
ST1	Southwestern project boundary	01.10.20	11:23 a.m. – 11:33 a.m.	59.1	73.2
ST2	Northwestern project boundary	01.10.20	11:55 a.m. – 12:05 p.m.	63.3	69.2
ST3	Eastern project boundary approximately 50 feet from Interstate 5	01.10.20	11:45 a.m. – 11:55 a.m.	71.2	76.6

Source: Appendix A.
Notes: L_{eq} = equivalent continuous sound level (time-averaged sound level); L_{max} = maximum sound level during the measurement interval; dBA = A-weighted decibels; ST = short-term noise measurement locations.

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SOURCE: SANGIS 2017

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0 37.5 75 Feet

FIGURE 3

Noise Measurement and Modeling Locations

Noise Technical Report for the Ida Avenue Project

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4 Thresholds of Significance

The following significance criteria are based on Appendix G of the California Environmental Quality Act Guidelines (14 CCR 15000 et seq.) and will be used to determine the significance of potential noise impacts. Impacts to noise would be significant if the proposed project would result in the following:

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. Expose people residing or working in the project area to excessive noise levels (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)

In light of these above significance criteria, this analysis uses the following standards to evaluate potential noise and vibration impacts.

- Construction noise –the City's noise ordinance states noise from construction equipment operation shall not exceed 75 dBA for more than eight hours during any 24 hour period when measured at or within property lines of any property which is developed and used either in part or in whole for residential purposes. Construction shall only occur between the hours of 7:00 a.m. through 7:00 p.m., Monday through Friday, and after 8:00 a.m. through 7:00 p.m. on Saturday. There shall be no construction activities on All day on Sundays, New Year's Day, Martin Luther King Day, President's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, and Christmas Day.
- Off-site project-attributed transportation noise – For purposes for this analysis, a direct roadway noise impact would be considered significant if increases in roadway traffic noise levels attributed to the proposed project were greater than 3 dBA CNEL at an existing noise-sensitive land use.
- Off-site project-attributed stationary noise – For purposes for this analysis, a noise impact would be considered significant if noise from typical operation of heating, ventilation, and air conditioning and other electro-mechanical systems associated with the proposed project exceeded 55 dBA hourly L_{eq} at the property line from 7:00 a.m. to 9:59 p.m., and 45 dBA hourly L_{eq} from 10:00 p.m. to 6:59 a.m.
- Construction vibration – Guidance from Caltrans indicates that a vibration velocity level of 0.2 ips PPV received at a structure would be considered annoying by occupants within (Caltrans 2013b). As for the receiving structure itself, aforementioned Caltrans guidance from Section 2 recommends that a vibration level of 0.3 ips PPV would represent the threshold for building damage risk.

For purposes of disclosure, since current CEQA noise criteria listed above do not consider it, this analysis also evaluates compatibility of on-site traffic noise exposure levels with the City of Solana Beach exterior and interior noise standards of 65 dBA CNEL and 45 dBA CNEL, respectively.

5 Impact Discussion

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?

Short-Term Construction

Construction noise and vibration are temporary phenomena. Construction noise and vibration levels vary from hour to hour and day to day, depending on the equipment in use, the operations performed, and the distance between the source and receptor.

Equipment that would be in use during construction would include, in part, graders, backhoes, rubber-tired dozers, loaders, cranes, forklifts, cement mixers, pavers, rollers, and air compressors. The typical maximum noise levels for various pieces of construction equipment at a distance of 50 feet are presented in Table 3. Usually, construction equipment operates in alternating cycles of full power and low power, producing average noise levels over time that are less than the listed maximum noise level. The average sound level of construction activity also depends on the amount of time that the equipment operates and the intensity of construction activities during that time.

Table 3. Typical Construction Equipment Maximum Noise Levels

Equipment Type	Typical Equipment (L_{max}, dBA at 50 Feet)
Air compressor	78
Backhoe	78
Concrete pump truck	81
Grader	85
Crane	81
Dump Truck	76
Dozer	82
Generator	72
Front End Loader	79
Paver	77
Pneumatic tools	85
Water pump	77

Source: DOT 2006.
Note: L_{max} = maximum sound level; dBA = A-weighted decibels.

Aggregate noise emission from proposed project construction activities, broken down by sequential phase, was predicted at two distances to the nearest existing noise-sensitive receptor: 1) from the nearest position of the construction site boundary and 2) from the geographic center of the construction site, which serves as the time-averaged location or geographic *acoustical centroid* of active construction equipment for the phase under study. The intent of the former distance is to help evaluate anticipated construction noise from a limited quantity of equipment or vehicle activity expected to be at the boundary for some period of time, which would be most appropriate for phases such as site preparation, grading, and paving. The latter distance is used in a manner similar to the general assessment technique as described in the FTA guidance for construction noise assessment, when the location of individual equipment for a given construction phase is uncertain over some extent of (or the entirety of) the construction site area. Because of this uncertainty, all the equipment for a construction phase is assumed to operate—on average—from the acoustical centroid. Table 4 summarizes these two distances to the apparent closest noise-sensitive receptor for each of the five sequential construction phases. At the site boundary, this

analysis assumes that up to only one piece of equipment of each listed type per phase will be involved in the construction activity for a limited portion of the 8-hour period. In other words, at such proximity, the operating equipment cannot "stack" or crowd the vicinity and still operate. For the acoustical centroid case, which intends to be a geographic average position for all equipment during the indicated phase, this analysis assumes that the equipment may be operating up to all eight hours per day.

Table 4. Estimated Distances between Construction Activities and the Nearest Noise-sensitive Receptors

Construction Phase (and Equipment Types Involved)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)*	Distance from Nearest Noise-Sensitive Receptor to Acoustical Centroid of Site (Feet)*
Site preparation (dozer, backhoe, grader)	15	300
Grading (grader, dozer, backhoe, scraper)	15	300
Building construction (crane, man-lift, generator, backhoe, scraper, welder/torch)	30	300
Architectural finishes (air compressor)	30	300
Paving (paver, roller, other equipment)	15	300

* Distances are in reference to sensitive receiver to the south.

A Microsoft Excel–based noise prediction model emulating and using reference data from the Federal Highway Administration Roadway Construction Noise Model (RCNM) (FHWA 2008) was used to estimate construction noise levels at the nearest occupied noise-sensitive land use. (Although the RCNM was funded and promulgated by the Federal Highway Administration, it is often used for non-roadway projects, because the same types of construction equipment used for roadway projects are often used for other types of construction.) Input variables for the predictive modeling consist of the equipment type and number of each (e.g., two graders, a loader, a tractor), the duty cycle for each piece of equipment (e.g., percentage of time within a specific time period, such as an hour, when the equipment is expected to operate at full power or capacity and thus make noise at a level comparable to what is presented in Table 3), and the distance from the noise-sensitive receiver. The predictive model also considers how many hours that equipment may be on site and operating (or idling) within an established work shift. Conservatively, no topographical or structural shielding was assumed in the modeling. The RCNM has default duty-cycle values for the various pieces of equipment, which were derived from an extensive study of typical construction activity patterns. Those default duty-cycle values were used for this noise analysis, which is detailed in Appendix B, Construction Noise Modeling Input and Output, and produce the predicted results displayed in Table 5.

Table 5. Predicted Construction Noise Levels per Activity Phase

Construction Phase (and Equipment Types Involved)	8-Hour Leq at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	8-Hour Leq at Nearest Noise-Sensitive Receptor to Acoustical Centroid of Site (dBA)
Site preparation (dozer, backhoe, grader)	84.9	75.9
Grading (grader, dozer, backhoe)	84.9	75.9
Building construction (crane, man-lift, generator, backhoe, scraper welder/torch)	78.0	71.3
Architectural finishes (air compressor)	77.2	65.5
Paving (paver, roller, other equipment)	82.1	73.3

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 5, the estimated construction noise levels are predicted to be as high as 85 dBA L_{eq} over an 8-hour period at the nearest existing residences (as close as 15 feet away) when site preparation activities take place near the southern project boundaries. Note that these estimated noise levels at a source-to-receiver distance of 15 feet would only occur when noted pieces of heavy equipment would each operate for a cumulative period from 1 to 3 hours a day. By way of example, a grader might make multiple passes on site that are this close to a receiver; but, for the remaining time during the day, the grader is sufficiently farther away, performing work at a more distant location, or simply not operating. For these instances when operation of construction equipment and processes are sufficiently proximate to cause activity noise levels to exceed 75 dBA L_{eq}, which the exceeds the City's daytime threshold for construction noise exposure over an 8-hour period at a residential receptor, suggested practices shall be incorporated into the project's construction program as mitigtation measures (**MM-NO1)**:

Although nearby off-site residences would be exposed to elevated construction noise levels, the increased noise levels would typically be relatively short term. It is anticipated that construction activities associated with the proposed project would take place only within the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday, and 8:00 a.m. to 7:00 p.m. on Saturdays, in compliance with the City's noise ordiance.

In summary, construction noise during allowable daytime hours would have the potential to exceed the 75 dBA L_{eq} 8-hour threshold at the nearest residential receiver on occasion. Thus, temporary construction-related noise impacts would be considered potentially significant unless mitigated. With implementation of **MM-NO1**, impacts would be reduced to **less than significant with mitigation**.

Long-Term Operational

Off-Site Roadway Traffic Noise

The proposed project would result in the creation of additional vehicle trips on local arterial roadways (i.e., Ida Avenue), which could result in increased traffic noise levels at adjacent noise-sensitive land uses. Appendix C, Traffic Noise Modeling Input and Output, contains a spreadsheet with traffic volume data (average daily traffic [ADT]) for Ida Avenue based on the Trip Generation Assessment prepared for the proposed project (LLG 2019). In particular, the proposed project would generate 48 ADT. Potential noise effects from vehicular traffic were assessed using the Federal Highway Administration's Traffic Noise Model version 2.5 (FHWA 2004). Information used in the model included the roadway geometry, posted traffic speeds, and traffic volumes for the following scenarios: existing (year 2020) and existing plus project.

The City's Noise Element establishes a policy for exterior sensitive areas to be protected from high noise levels. The Noise Element sets 65 dBA CNEL for the outdoor areas and 45 dBA CNEL for interior areas as the normally acceptable levels. For the purposes of this noise analysis, roadway traffic noise impacts are considered significant when they cause an increase of 3 dB from existing noise levels. An increase or decrease in noise level of at least 3 dB is required before any noticeable change in community response would be expected (Caltrans 2013a).

According to acoustical principles, the increase in traffic noise level relates directly to the increase in volumes by the following expression: $10*LOG(V_f/V_e)$, where V_f is the future traffic volume, V_e is the existing traffic volume, and vehicle speeds and proportion of vehicle types are essentially unchanged. Hence, the project would have to roughly double the traffic volumes on the North Coast Highway to increase traffic by 3 dBA. Based on the aforementioned ADT value, there are no traffic volume comparisons for the indicated Ida Avenue roadway segment where the estimated traffic noise increase would exceed 3 dBA.

Traffic noise levels were modeled at representative noise-sensitive receivers ST1 through ST3, as shown in Figure 3. The receivers were modeled to be 5 feet above the local ground elevation. The traffic noise model results are summarized in Table 6, and represented by CNEL values. The predicted CNEL values for existing conditions shown in Table 6 are each within +/-2.2 dB of the measurement-based CNEL (approximated by the L_{eq} values) listed in Table 2 for the, which suggests good agreement since a 2-3 dB difference is barely perceptible. Validated by this value agreement, the same TNM-based model is used to predict the future "existing + project" traffic noise level.

Table 6. Off-site Roadway Traffic Noise Modeling Results

Modeled Receiver Tag (Location Description)	Existing (2020) Noise Level (dBA CNEL)	Existing (2020) Plus Project Noise Level (dBA CNEL)	Maximum Project-Related Noise Level Increase (dB)
ST1 (Southwestern project boundary)	61.3	59.6	-1.7
ST2 (Northwestern project boundary)	64.2	61.5	-2.7
ST3 (Eastern project boundary approximately 50 feet from interstate 5)	69.7	64.5	-5.2

Notes: dBA = A-weighted decibel; CNEL = Community Noise Equivalent Level; dB = decibel.

Table 6 shows that at all three listed representative receivers, the addition of proposed project traffic to the roadway network would result in a CNEL increase of less than 3 dB, which is below the discernible level of change for the average healthy human ear. In fact, the installation of the proposed project would add sound-path occlusion and result in predicted SPL that are lower than existing measured levels. In other words, the development of the proposed project site and its erection of multi-story structures would create sound barriers between the measurement locations and the highway (the source of dominant acoustical contribution to the outdoor ambient sound environment) and result in these anticipated decreases of measured sound level. Thus, a **less-than-significant impact** is expected for proposed project-related off-site traffic noise increases affecting existing residences in the vicinity.

Traffic Noise Exposure to Future Project Occupants

Aside from exposure to aviation traffic noise, current CEQA noise-related guidelines do not require an assessment of exterior-to-interior noise intrusion, environmental noise exposure to occupants of newly-created project residences, or environmental noise exposure to exterior non-residential uses attributed to the development of the proposed project. Nevertheless, the California Building Code requires that interior background noise levels not exceed a CNEL of 45 dB within habitable rooms. Hence, the following predictive analysis of traffic noise exposure at the exteriors of occupied residences and outdoor living areas is provided for informational purposes.

In addition to the prediction results presented in Table 6, the FHWA TNM was also used to predict the Existing + Project scenario traffic noise levels at multiple on-site exterior areas, as listed in Table 7. Modeled receptor locations, which appear in Figure 3, include representative positions for the exteriors of multiple floors of the eastern facades.

Table 7. On-Site Roadway Traffic Noise Modeling Results

Location	Modeled receiver	Description	Predicted Traffic Noise Exposure at Modeled Receiver (dBA CNEL)
6 Unit Building	M1	Patio	61.0
	M2	1st floor	60.4
	M3	2nd floor	64.5
	M4	Patio	60.7
	M5	1st floor	60.4
	M6	2nd floor	65.0
	M7	Patio	61.5
	M8	1st floor	61.3
	M9	2nd floor	65.3
2 Unit Building	M10	Patio	62.8
	M11	1st floor	61.7
	M12	2nd floor	66.1

Notes: dBA = A-weighted decibel; CNEL = Community Noise Equivalent Level.

Table 7 shows that at some representative eastern facade positions, predicted on-site CNEL values are slightly greater than 65 dBA while others are compatible with the City's guidance for exterior noise levels.

Typically, with the windows open, building shells provide approximately 15 dB (i.e., an average of 12-18 dB [OPR 2017]) of exterior-to-interior noise reduction; while with windows closed residential construction generally provides a minimum of 25 dB attenuation (FHWA 2011). Therefore, rooms exposed to an exterior CNEL not greater than 60 dB would result in an interior background CNEL of 45 dB or less, even with open fenestration. In other words, the arithmetic difference of an exterior noise level less than 60 dBA CNEL and an exposed building façade that provides 15 dB of sound insulation results in an interior background sound level less than 45 dBA CNEL.

The data shown in Table 7 indicate that the traffic noise level exposures would exceed 65 dBA CNEL at the eastern facades of the proposed residences fronting the Interstate 5 freeway. The unmitigated interior noise levels within the habitable rooms of these dwelling units could therefore exceed the 45 dBA CNEL noise criterion. A subsequent interior noise analysis would be required for these units. With the proper implementation of mitigation measure MM-NO2, the resultant noise level would meet the state and City interior noise standard of 45 dBA CNEL.

Stationary Operations Noise

The incorporation of new multifamily homes and a mix of open space uses attributed to development of the proposed project will add a variety of noise-producing mechanical equipment that include those presented and discussed in the following paragraphs. Most of these noise-producing equipment or sound sources would be considered stationary, or limited in mobility to a defined area. Using a Microsoft Excel–based outdoor sound propagation prediction model, project-attributed operational noise at nearby community receptors was predicted using several assumptions:

- Treatment of exposed patio air-cooled condensing units as point-type sound emission sources; and,
- Point-source sound propagation (i.e., 6 dB per doubling of distance) that conservatively ignores acoustical absorption from atmospheric and ground surface effects.

Please see Appendix D for quantitative details of the below predictions.

Residential Unit Heating, Ventilation, and Air Conditioning Noise

For purposes of this analysis, each of the new occupied residential units would be expected to feature a split-system type air-conditioning unit, with an air-cooled refrigeration (4-ton capacity) condenser unit in the patio area as currently depicted by the site plan (dated June 24, 2020).

Assuming each condenser unit has an SPL of 66 dBA at 3 feet based on available data from a likely manufacturer (Johnson Controls 2010), the site plan suggests that these condenser units would generally be installed near the patio wall in the highway-facing open space area (i.e., apparent "backyard"). Therefore, the closest existing noise-sensitive residential receptor to the south of the proposed project's southernmost unit would be as close as 40 horizontal feet to the nearest of these condenser units. However, due to the privacy walls separating the residential unit patio areas, as well as the 6-foot tall property line wall proposed along the southern property boundary, the predicted sound emission level from the combination of all eight operating condenser units at this offsite single-family receptor would be 44 dBA L_{eq} and thus be compliant with the City's nighttime threshold of 45 dBA hourly L_{eq}. Under such conditions, the operation of residential air-conditioning units would result in a **less-than-significant noise impact**.

b) Would the project result in generation of excessive groundborne vibration or groundborne noise levels?

Construction activities may expose persons to excessive groundborne vibration or groundborne noise, causing a potentially significant impact. Caltrans has collected groundborne vibration information related to construction activities (Caltrans 2013b). Information from Caltrans indicates that continuous vibrations with a PPV of approximately 0.2 ips is considered annoying. For context, heavier pieces of construction equipment, such as a bulldozer that may be expected on the project site, have peak particle velocities of approximately 0.089 ips or less at a reference distance of 25 feet (DOT 2006).

Groundborne vibration attenuates rapidly, even over short distances. The attenuation of groundborne vibration as it propagates from source to receptor through intervening soils and rock strata can be estimated with expressions found in FTA and Caltrans guidance. By way of example, for a bulldozer operating on site and as close as the western project boundary (i.e., 15 feet from the nearest receiving sensitive land use) the estimated vibration velocity level would be 0.19 ips per the equation as follows (FTA 2006):

$PPV_{rcvr} = PPV_{ref} * (25/D)^1.5 = 0.19 = 0.089 * (25/15)^1.5$

In the above equation, PPV_{rcvr} is the predicted vibration velocity at the receiver position, PPV_{ref} is the reference value at 25 feet from the vibration source (the bulldozer), and D is the actual horizontal distance to the receiver. Therefore, at this predicted PPV, the impact of vibration-induced annoyance to occupants of nearby existing homes would be less than significant.

Construction vibration, at sufficiently high levels, can also present a building damage risk. However, anticipated construction vibration associated with the proposed project would yield levels of 0.19 ips, which do not surpass the guidance limit of 0.2 to 0.3 ips PPV for preventing damage to residential structures (Caltrans 2013b). Because the predicted vibration level at 15 feet is less than this guidance limit, the risk of vibration damage to nearby structures is considered less than significant.

Once operational, the proposed project would not be expected to feature major producers of groundborne vibration. Anticipated mechanical systems like heating, ventilation, and air-conditioning units are designed and manufactured

to feature rotating (fans, motors) and reciprocating (compressors) components that are well-balanced with isolated vibration within or external to the equipment casings. On this basis, potential vibration impacts due to proposed project operation would be **less than significant**.

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 two 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?*

There are no private airstrips within the vicinity of the project site. The closest public airport to the project site is the McClellan Palomar Aiport, approximately 10 miles northeast of the site. Impacts from aviation overflight noise exposure would have **no impact.**

6 Mitigation Measures

The following mitigation measure, introduced in Section 5, Impact Discussion, would apply during construction activities.

MM-NO1:

The below mitigation measures shall be implemented as indicated site conditions may warrant. Proper application of temporary noise barriers or comparable sound abatement can feasibly reduce noise levels by at least 10 dB, which would correspondingly reduce the predicted 85 dBA 8-hour L_{eq} for the site preparation and grading phase to 75 dBA L_{eq} and thereby enable compliance with the 75 dBA threshold.

- Administrative controls (e.g., reduce operating time of equipment and/or prohibit usage of equipment type[s] within certain distances).
- Engineering controls (upgrade noise controls, such as install better engine exhaust mufflers).
- Install noise abatement on the site boundary fencing (or within, as practical and appropriate) in the form of sound blankets or comparable temporary barriers to occlude construction noise emission between the site (or specific equipment operation as the situation may define) and the noise-sensitive receptor(s) of concern.
- At the outset of project grading, a noise monitor would be onsite to ensure that noise levels at adjacent sensitive receptors are in conformance with the 75 dBA threshold.

In order to ensure traffic noise exposure to future occupants of the project site would not be exposed to noise levels that exceed 45 dBA CNEL criterion within habitable rooms of the dwelling units with façades fronting the vicinity major roadways, the project would implement the following mitigation measure.

MM-NO2:

An exterior-to-interior noise analysis shall be conducted by the project applicant for the proposed dwelling units facing the adjoining roadways (e.g., Interstate 5) prior to issuance of building permits. Installation of mechanical ventilation systems or air conditioning systems and sound-rated windows shall be required if the predicted interior background noise due to traffic noise intrusion through the building envelope assemblies exceeds the state and City's 45 dBA CNEL interior standard. The acoustical analysis shall substantiate that the resulting interior background noise levels, with appropriate implementation of interior comfort systems and sound insulation, will be less than this noise standard.

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7 Summary of Findings

This noise report was conducted for the proposed project. The results indicate that potential impacts during construction would be less than significant with implementation of proposed mitigation measures. Noise impacts due to operation of the proposed project (including traffic noise) would be less than significant. No further mitigation is required.

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Appendix A

Baseline Noise Measurement Field Data

DUDEK
CREATOR OF KERATA TECHNOLOGY

FIELD DATA REPORT

Field Noise Measurement Data

Record: 1217	
Project Name	*Ida Ave*
Observer(s)	*Connor Burke*
Date	*2020-01-10*

Meteorological Conditions	
Temp (F)	*61*
Humidity % (R.H.)	*58*
Wind	*Calm*
Wind Speed (MPH)	*3*
Wind Direction	*East*
Sky	*Sunny*

Instrument and Calibrator Information	
Instrument Name List	*(ENC) Rion NL-52*
Instrument Name	*(ENC) Rion NL-52*
Instrument Name Lookup Key	*(ENC) Rion NL-52*
Manufacturer	*Rion*
Model	*NL-52*
Serial Number	*553896*
Calibrator Name	*(ENC) LD CAL150*
Calibrator Name	*(ENC) LD CAL150*
Calibrator Name Lookup Key	*(ENC) LD CAL150*
Calibrator Manufacturer	*Larson Davis*
Calibrator Model	*LD CAL150*
Calibrator Serial #	*5152*
Pre-Test (dBA SPL)	*94*
Post-Test (dBA SPL)	*94*
Windscreen	*Yes*
Weighting?	*A-WTD*
Slow/Fast?	*Slow*
ANSI?	*Yes*

Monitoring	
Record #	*1*
Site ID	*ST1*
Site Location Lat/Long	*32.986211, -117.255984*
Begin (Time)	*11:23:00*
End (Time)	*11:33:00*
Leq	*59.1*
Lmax	*73.2*
Lmin	*49.5*
Other Lx?	*L90, L50, L10*
L90	*51.1*
L50	*53.6*
L10	*61.7*
Other Lx (Specify Metric)	*L*
Primary Noise Source	*Distant traffic.*
Other Noise Sources (Background)	*Birds, Distant Aircraft, Distant Conversations / Yelling, Distant Traffic*
Is the same instrument and calibrator being used as previously noted?	*Yes*
Are the meteorological conditions the same as previously noted?	*Yes*

Description / Photos

Site Photos

Photo	
	
Comments / Description	*Facing north.*

Monitoring

Record #	*2*
Site ID	*ST3*
Site Location Lat/Long	*32.986383, -117.255588*
Begin (Time)	*11:45:00*
End (Time)	*11:55:00*
Leq	*71.2*
Lmax	*76.6*
Lmin	*65.4*
Other Lx?	*L90, L50, L10*
L90	*68.3*
L50	*70.7*
L10	*72.9*
Other Lx (Specify Metric)	*L*
Primary Noise Source	*Traffic*
Other Noise Sources Additional Description	*Freeway traffic 100 feet away.*
Is the same instrument and calibrator being used as previously noted?	*Yes*
Are the meteorological conditions the same as previously noted?	*Yes*

Description / Photos

Site Photos

Photo



Monitoring

Record #	*3*
Site ID	*ST3*
Site Location Lat/Long	*32.987533, -117.255932*
Begin (Time)	*11:55:00*
End (Time)	*12:05:00*
Leq	*63.3*
Lmax	*69.2*
Lmin	*58*
Other Lx?	*L90, L50, L10*
L90	*60.7*
L50	*62.4*
L10	*65.7*
Other Lx (Specify Metric)	*L*
Primary Noise Source	*Traffic*
Other Noise Sources (Background)	*Birds*
Other Noise Sources Additional Description	*Freeway traffic dominant*
Is the same instrument and calibrator being used as previously noted?	*Yes*
Are the meteorological conditions the same as previously noted?	*Yes*

Description / Photos

Site Photos

Photo



Appendix B

Construction Noise Modeling Input and Output

To User: bordered cells are inputs, unbordered cells have formulae

noise level limit for construction phase, per County = 75

allowable hours over which Leq is to be averaged (example: 8 for County of San Diego, FTA guidance) = 8

Construction Phase	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 8-hour Leq
Site Preparation	Dozer	1	40	82		15	92.5	3	180	84
	Grader	1	40	85		30	89.4	1	60	76
	Backhoe	1	40	78		75	74.5	3	180	66
							Total for Site Preparation Phase:			84.9
Grading	Dozer	1	40	82		15	92.5	3	180	84
	Grader	1	40	85		30	89.4	1	60	76
	Backhoe	1	40	78		75	74.5	3	180	66
							Total for Grading Phase:			84.9
Building Construction	Crane	1	16	81		30	85.4	6	360	76
	Man Lift	1	20	75		60	73.4	6	360	65
	Generator	1	50	72		75	68.5	8	480	65
	Backhoe	1	40	78		75	74.5	6	360	69
	Welder / Torch	3	40	73		100	67.0	8	480	68
							Total for Building Construction Phase:			78.0
Architectural Coating	Compressor (air)	1	40	78		30	82.4	6	360	77
							Total for Architectural Coating Phase:			77.2
Paving	Concrete Mixer Truck	1	40	79		15	89.5	3	180	81
	Roller	1	20	80		30	84.4	3	180	73
	Backhoe	1	40	78		75	74.5	3	180	66
	Paver	1	50	77		75	73.5	3	180	66
	paver	1	50	77		100	71.0	3	180	64
							Total for Paving Phase:			82.1

To User: bordered cells are inputs, unbordered cells have formulae

noise level limit for construction phase, per County = 75

allowable hours over which Leq is to be averaged (example: 8 for County of San Diego, FTA guidance) = 8

Construction Phase	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 8-hour Leq
Site Preparation	Dozer	1	40	82		115	74.8	7	420	70
	Grader	1	40	85		115	77.8	8	480	74
	Backhoe	1	40	78		115	70.8	8	480	67
								Total for Site Preparation Phase:		75.9
Grading	Dozer	1	40	82		115	74.8	7	420	70
	Grader	1	40	85		115	77.8	8	480	74
	Backhoe	1	40	78		115	70.8	8	480	67
								Total for Grading Phase:		75.9
Building Construction	Crane	1	16	81		115	73.8	7	420	65
	Man Lift	1	20	75		115	67.8	8	480	61
	Generator	1	50	72		115	64.8	6	360	61
	Backhoe	1	40	78		115	70.8	8	480	67
	Welder / Torch	3	40	73		115	65.8	8	480	67
								Total for Building Construction Phase:		71.7
Architectural Coating	Compressor (air)	1	40	78		115	70.8	6	360	66
								Total for Architectural Coating Phase:		65.5
Paving	Concrete Mixer Truck	1	40	79		115	71.8	6	360	67
	Roller	1	20	80		115	72.8	8	480	66
	Backhoe	1	40	78		115	70.8	8	480	67
	Paver	1	50	77		115	69.8	8	480	67
	paver	1	50	77		115	69.8	8	480	67
								Total for Paving Phase:		73.5

Appendix C

Traffic Noise Modeling Input and Output

<Organization?> 5 February 2020
<Analysis By?> TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: <Project Name?>
RUN: <Run Title?>

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Roadway2	12.0	point3	3	1,561,904.1	11,975,475.0	0.00				Average	
		point4	4	1,561,932.6	11,975,275.0	0.00				Average	
		point5	5	1,561,968.1	11,975,064.0	0.00				Average	
		point6	6	1,561,976.0	11,974,961.0	0.00				Average	
		point7	7	1,561,978.5	11,974,877.0	0.00				Average	
		point8	8	1,561,968.6	11,974,586.0	0.00				Average	
		point9	9	1,561,966.6	11,974,212.0	0.00				Average	
		point10	10	1,561,962.9	11,973,799.0	0.00				Average	
		point11	11	1,561,960.8	11,973,522.0	0.00					
Roadway3	12.0	point12	12	1,561,973.4	11,975,921.0	10.00				Average	
		point13	13	1,562,002.0	11,975,685.0	10.00				Average	
		point14	14	1,562,056.8	11,975,300.0	10.00				Average	
		point15	15	1,562,114.4	11,974,871.0	10.00				Average	
		point16	16	1,562,165.1	11,974,466.0	10.00				Average	
		point17	17	1,562,196.0	11,974,226.0	10.00				Average	
		point18	18	1,562,237.1	11,973,939.0	10.00				Average	
		point19	19	1,562,329.4	11,973,530.0	10.00					
Roadway4	12.0	point20	20	1,562,065.0	11,975,921.0	10.00				Average	
		point21	21	1,562,086.0	11,975,734.0	10.00				Average	
		point22	22	1,562,140.0	11,975,368.0	10.00				Average	
		point23	23	1,562,192.9	11,974,940.0	10.00				Average	
		point24	24	1,562,250.8	11,974,524.0	10.00				Average	
		point25	25	1,562,287.6	11,974,175.0	10.00				Average	
		point26	26	1,562,328.9	11,973,913.0	10.00				Average	
		point27	27	1,562,410.9	11,973,527.0	10.00					

<Organization?> 5 February 2020
<Analysis By?> TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: <Project Name?>
RUN: <Run Title?>

Roadway	Points		Segment									
Name	Name	No.	Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Roadway2	point3	3	0	0	0	0	0	0	0	0	0	0
	point4	4	0	0	0	0	0	0	0	0	0	0
	point5	5	0	0	0	0	0	0	0	0	0	0
	point6	6	0	0	0	0	0	0	0	0	0	0
	point7	7	0	0	0	0	0	0	0	0	0	0
	point8	8	0	0	0	0	0	0	0	0	0	0
	point9	9	0	0	0	0	0	0	0	0	0	0
	point10	10	0	0	0	0	0	0	0	0	0	0
	point11	11										
Roadway3	point12	12	8330	65	2380	65	1190	65	0	0	0	0
	point13	13	8330	65	2380	65	1190	65	0	0	0	0
	point14	14	8330	65	2380	65	1190	65	0	0	0	0
	point15	15	8330	65	2380	65	1190	65	0	0	0	0
	point16	16	8330	65	2380	65	1190	65	0	0	0	0
	point17	17	8330	65	2380	65	1190	65	0	0	0	0
	point18	18	8330	65	2380	65	1190	65	0	0	0	0
	point19	19										
Roadway4	point20	20	8470	65	2420	65	1210	65	0	0	0	0
	point21	21	8470	65	2420	65	1210	65	0	0	0	0
	point22	22	8470	65	2420	65	1210	65	0	0	0	0
	point23	23	8470	65	2420	65	1210	65	0	0	0	0
	point24	24	8470	65	2420	65	1210	65	0	0	0	0
	point25	25	8470	65	2420	65	1210	65	0	0	0	0

	point26	26	8470	65	2420	65	1210	65	0	0	0	0
	point27	27										

<Organization?>
<Analysis By?>

5 February 2020
TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: <Project Name?>
RUN: <Run Title?>

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
ST1	1	1	1,561,982.0	11,974,333.0	0.00	4.92	0.00	66	10.0	8.0	Y
ST3	2	1	1,562,080.6	11,974,418.0	15.00	4.92	0.00	66	10.0	8.0	Y
ST2	3	1	1,561,997.2	11,974,839.0	-5.00	4.92	0.00	66	10.0	8.0	Y

<Organization?> 5 February 2020
<Analysis By?> TNM 2.5

INPUT: BARRIERS
PROJECT/CONTRACT: <Project Name?>
RUN: <Run Title?>

Barrier									Points										
Name	Type	Height		If Wall	If Berm			Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment				
		Min	Max	$ per Unit Area	$ per Unit Vol.	Top Width	Run:Rise	$ per Unit Length			X	Y	Z	at Point	Seg Ht Incre-ment	Perturbs #Up	#Dn	On Struct?	Important Reflec-tions?
		ft	ft	$/sq ft	$/cu yd	ft	ft:ft	$/ft			ft	ft	ft	ft	ft				
Barrier14	W	0.00	99.99	0.00				0.00	point91	91	1,562,266.8	11,974,058.0	10.00	4.00	0.00	0	0		
									point92	92	1,562,236.1	11,974,272.0	10.00	4.00	0.00	0	0		
									point93	93	1,562,216.1	11,974,448.0	10.00	4.00	0.00	0	0		
									point94	94	1,562,188.6	11,974,670.0	10.00	4.00	0.00	0	0		
									point95	95	1,562,163.9	11,974,892.0	10.00	4.00	0.00	0	0		
									point96	96	1,562,130.4	11,975,105.0	10.00	4.00	0.00	0	0		
									point97	97	1,562,104.4	11,975,294.0	10.00	4.00					
Barrier16	W	0.00	99.99	0.00				0.00	point100	100	1,562,006.5	11,974,249.0	0.00	20.00	0.00	0	0		
									point101	101	1,562,004.8	11,974,309.0	0.00	20.00	0.00	0	0		
									point102	102	1,562,034.4	11,974,310.0	0.00	20.00	0.00	0	0		
									point103	103	1,562,032.2	11,974,326.0	0.00	20.00	0.00	0	0		
									point104	104	1,562,065.2	11,974,328.0	0.00	20.00	0.00	0	0		
									point105	105	1,562,065.4	11,974,294.0	0.00	20.00	0.00	0	0		
									point106	106	1,562,049.6	11,974,294.0	0.00	20.00	0.00	0	0		
									point107	107	1,562,049.8	11,974,259.0	0.00	20.00	0.00	0	0		
									point108	108	1,562,037.8	11,974,259.0	0.00	20.00	0.00	0	0		
									point109	109	1,562,036.8	11,974,249.0	0.00	20.00	0.00	0	0		
									point110	110	1,562,006.5	11,974,249.0	0.00	20.00					

<Organization?>			5 February 2020	
<Analysis By?>			TNM 2.5	
INPUT: TERRAIN LINES				
PROJECT/CONTRACT:	<Project Name?>			
RUN:	<Run Title?>			
Terrain Line	Points			
Name	No.	Coordinates (ground)		
		X	Y	Z
		ft	ft	ft
Terrain Line2	10	1,562,007.0	11,975,308.0	25.00
	11	1,562,061.1	11,974,814.0	25.00
	12	1,562,072.0	11,974,749.0	25.00
	13	1,562,073.5	11,974,706.0	25.00
	14	1,562,077.1	11,974,673.0	25.00
	15	1,562,079.5	11,974,633.0	25.00
	16	1,562,083.1	11,974,616.0	25.00
	17	1,562,090.5	11,974,582.0	25.00
	18	1,562,097.2	11,974,508.0	25.00
	19	1,562,100.9	11,974,443.0	25.00
	20	1,562,107.2	11,974,387.0	25.00
	21	1,562,111.8	11,974,352.0	25.00
	22	1,562,117.6	11,974,310.0	25.00
	23	1,562,228.2	11,973,749.0	25.00
Terrain Line3	24	1,562,057.4	11,974,932.0	10.00
	25	1,562,074.0	11,974,804.0	10.00
	26	1,562,084.2	11,974,723.0	10.00
	27	1,562,098.6	11,974,614.0	10.00
	28	1,562,111.0	11,974,524.0	10.00
	29	1,562,118.8	11,974,454.0	10.00
	30	1,562,127.4	11,974,389.0	10.00
	31	1,562,141.2	11,974,289.0	10.00

<Organization?>
<Analysis By?>

5 February 2020
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: <Project Name?>
RUN: <Run Title?>
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
ST1	1	1	0.0	61.3	66	61.3	10	----	61.3	0.0	8	-8.0
ST3	2	1	0.0	69.7	66	69.7	10	Snd Lvl	69.7	0.0	8	-8.0
ST2	3	1	0.0	64.2	66	64.2	10	----	64.2	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	3	0.0	0.0	0.0
All Impacted	1	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

<Organization?> 5 February 2020
<Analysis By?> TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: <Project Name?>
RUN: <Run Title?>

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Roadway3	12.0	point12	12	1,561,973.4	11,975,921.0	10.00				Average	
		point13	13	1,562,002.0	11,975,685.0	10.00				Average	
		point14	14	1,562,056.8	11,975,300.0	10.00				Average	
		point15	15	1,562,114.4	11,974,871.0	10.00				Average	
		point16	16	1,562,165.1	11,974,466.0	10.00				Average	
		point17	17	1,562,196.0	11,974,226.0	10.00				Average	
		point18	18	1,562,237.1	11,973,939.0	10.00				Average	
		point19	19	1,562,329.4	11,973,530.0	10.00					
Roadway4	12.0	point20	20	1,562,065.0	11,975,921.0	0.00				Average	
		point21	21	1,562,086.0	11,975,734.0	0.00				Average	
		point22	22	1,562,140.0	11,975,368.0	0.00				Average	
		point23	23	1,562,192.9	11,974,940.0	0.00				Average	
		point24	24	1,562,250.8	11,974,524.0	0.00				Average	
		point25	25	1,562,287.6	11,974,175.0	0.00				Average	
		point26	26	1,562,328.9	11,973,913.0	0.00				Average	
		point27	27	1,562,410.9	11,973,527.0	0.00					
Roadway2-2-Roadway2	12.0	point3	3	1,561,904.1	11,975,475.0	-10.00				Average	
		point4	4	1,561,932.6	11,975,275.0	-8.00				Average	
		point5	5	1,561,968.1	11,975,064.0	-6.00				Average	
		point6	6	1,561,976.0	11,974,961.0	-4.00				Average	
		point7	7	1,561,978.4	11,974,825.0	-4.00				Average	
		point61	61	1,561,978.5	11,974,817.0	0.00				Average	
		point8	8	1,561,968.6	11,974,586.0	0.00				Average	
		point9	9	1,561,966.6	11,974,212.0	0.00				Average	
		point10	10	1,561,962.9	11,973,799.0	0.00				Average	

		point11	11	1,561,960.8	11,973,522.0	0.00					

<Organization?> 5 February 2020
<Analysis By?> TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: <Project Name?>
RUN: <Run Title?>

Roadway	Points		Segment									
Name	Name	No.	Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Roadway3	point12	12	8330	65	2380	65	1190	65	0	0	0	0
	point13	13	8330	65	2380	65	1190	65	0	0	0	0
	point14	14	8330	65	2380	65	1190	65	0	0	0	0
	point15	15	8330	65	2380	65	1190	65	0	0	0	0
	point16	16	8330	65	2380	65	1190	65	0	0	0	0
	point17	17	8330	65	2380	65	1190	65	0	0	0	0
	point18	18	8330	65	2380	65	1190	65	0	0	0	0
	point19	19										
Roadway4	point20	20	8470	65	2420	65	1210	65	0	0	0	0
	point21	21	8470	65	2420	65	1210	65	0	0	0	0
	point22	22	8470	65	2420	65	1210	65	0	0	0	0
	point23	23	8470	65	2420	65	1210	65	0	0	0	0
	point24	24	8470	65	2420	65	1210	65	0	0	0	0
	point25	25	8470	65	2420	65	1210	65	0	0	0	0
	point26	26	8470	65	2420	65	1210	65	0	0	0	0
	point27	27										
Roadway2-2-Roadway2	point3	3	4	25	0	0	0	0	0	0	0	0
	point4	4	4	25	0	0	0	0	0	0	0	0
	point5	5	4	25	0	0	0	0	0	0	0	0
	point6	6	4	25	0	0	0	0	0	0	0	0
	point7	7	4	25	0	0	0	0	0	0	0	0
	point61	61	4	25	0	0	0	0	0	0	0	0
	point8	8	4	25	0	0	0	0	0	0	0	0

	point9	9	4	25	0	0	0	0	0	0	0	0
	point10	10	4	25	0	0	0	0	0	0	0	0
	point11	11										

<Organization?>
<Analysis By?>

5 February 2020
TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: <Project Name?>
RUN: <Run Title?>

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
ST1	1	1	1,561,982.0	11,974,333.0	0.00	4.92	0.00	66	10.0	8.0	Y
ST3	2	1	1,562,080.6	11,974,418.0	15.00	4.92	0.00	66	10.0	8.0	Y
ST2	3	1	1,561,997.2	11,974,839.0	-5.00	4.92	0.00	66	10.0	8.0	Y
M1	5	1	1,562,067.1	11,974,377.0	5.00	4.92	0.00	66	10.0	8.0	Y
M2	6	1	1,562,063.2	11,974,365.0	5.00	4.92	0.00	66	10.0	8.0	Y
M3	7	1	1,562,063.2	11,974,365.0	5.00	14.92	0.00	66	10.0	8.0	Y
M4	8	1	1,562,065.9	11,974,421.0	5.00	4.92	0.00	66	10.0	8.0	Y
M5	9	1	1,562,057.5	11,974,419.0	5.00	4.92	0.00	66	10.0	8.0	Y
M6	10	1	1,562,057.5	11,974,419.0	5.00	14.92	0.00	66	10.0	8.0	Y
M7	11	1	1,562,057.0	11,974,523.0	5.00	4.92	0.00	66	10.0	8.0	Y
M8	12	1	1,562,052.2	11,974,520.0	5.00	4.92	0.00	66	10.0	8.0	Y
M9	13	1	1,562,052.4	11,974,520.0	5.00	14.92	0.00	66	10.0	8.0	Y
M10	14	1	1,562,047.5	11,974,669.0	5.00	4.92	0.00	66	10.0	8.0	Y
M11	15	1	1,562,038.2	11,974,687.0	5.00	4.92	0.00	66	10.0	8.0	Y
M12	16	1	1,562,038.2	11,974,687.0	5.00	14.92	0.00	66	10.0	8.0	Y
M13	17	1	1,562,006.9	11,974,603.0	5.00	4.92	0.00	66	10.0	8.0	Y

<Organization?>
<Analysis By?>
5 February 2020
TNM 2.5

INPUT: BARRIERS
PROJECT/CONTRACT: <Project Name?>
RUN: <Run Title?>

Barrier									Points										
Name	Type	Height		If Wall	If Berm			Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment				
		Min	Max	$ per Unit Area	$ per Unit Vol.	Top Width	Run:Rise	$ per Unit Length			X	Y	Z	at Point	Seg Ht Incre-ment	Perturbs #Up	#Dn	On Struct?	Important Reflec-tions?
		ft	ft	$/sq ft	$/cu yd	ft	ft:ft	$/ft			ft	ft	ft	ft	ft				
Barrier1	W	0.00	99.99	0.00				0.00	point1	1	1,562,021.5	11,974,344.0	5.00	25.00	0.00	0	0		
									point2	2	1,562,018.5	11,974,365.0	5.00	25.00	0.00	0	0		
									point3	3	1,562,023.4	11,974,367.0	5.00	25.00	0.00	0	0		
									point4	4	1,562,021.9	11,974,378.0	5.00	25.00	0.00	0	0		
									point5	5	1,562,027.4	11,974,379.0	5.00	25.00	0.00	0	0		
									point6	6	1,562,026.6	11,974,391.0	5.00	25.00	0.00	0	0		
									point7	7	1,562,021.5	11,974,389.0	5.00	25.00	0.00	0	0		
									point8	8	1,562,023.2	11,974,417.0	5.00	25.00	0.00	0	0		
									point9	9	1,562,022.2	11,974,428.0	5.00	25.00	0.00	0	0		
									point10	10	1,562,019.1	11,974,427.0	5.00	25.00	0.00	0	0		
									point11	11	1,562,017.0	11,974,446.0	5.00	25.00	0.00	0	0		
									point12	12	1,562,009.9	11,974,446.0	5.00	25.00	0.00	0	0		
									point13	13	1,562,009.8	11,974,453.0	5.00	25.00	0.00	0	0		
									point14	14	1,562,017.4	11,974,455.0	5.00	25.00	0.00	0	0		
									point15	15	1,562,015.4	11,974,463.0	5.00	25.00	0.00	0	0		
									point16	16	1,562,019.8	11,974,464.0	5.00	25.00	0.00	0	0		
									point17	17	1,562,016.1	11,974,498.0	5.00	25.00	0.00	0	0		
									point18	18	1,562,023.6	11,974,499.0	5.00	25.00	0.00	0	0		
									point19	19	1,562,022.4	11,974,509.0	5.00	25.00	0.00	0	0		
									point20	20	1,562,018.8	11,974,509.0	5.00	25.00	0.00	0	0		
									point21	21	1,562,016.6	11,974,542.0	5.00	25.00	0.00	0	0		
									point22	22	1,562,024.5	11,974,545.0	5.00	25.00	0.00	0	0		
									point23	23	1,562,024.8	11,974,555.0	5.00	25.00	0.00	0	0		
									point24	24	1,562,019.0	11,974,554.0	5.00	25.00	0.00	0	0		
									point25	25	1,562,015.8	11,974,595.0	5.00	25.00	0.00	0	0		
									point26	26	1,562,044.0	11,974,597.0	5.00	25.00	0.00	0	0		
									point27	27	1,562,048.5	11,974,553.0	5.00	25.00	0.00	0	0		
									point28	28	1,562,039.8	11,974,552.0	5.00	25.00	0.00	0	0		
									point29	29	1,562,041.9	11,974,530.0	5.00	25.00	0.00	0	0		
									point30	30	1,562,050.1	11,974,530.0	5.00	25.00	0.00	0	0		
									point31	31	1,562,052.9	11,974,504.0	5.00	25.00	0.00	0	0		
									point32	32	1,562,048.6	11,974,502.0	5.00	25.00	0.00	0	0		
									point33	33	1,562,051.5	11,974,477.0	5.00	25.00	0.00	0	0		
									point34	34	1,562,042.5	11,974,475.0	5.00	25.00	0.00	0	0		
									point35	35	1,562,043.6	11,974,460.0	5.00	25.00	0.00	0	0		

									point36	36	1,562,047.6	11,974,460.0	5.00	25.00	0.00	0	0		
									point37	37	1,562,048.2	11,974,452.0	5.00	25.00	0.00	0	0		
									point38	38	1,562,053.2	11,974,453.0	5.00	25.00	0.00	0	0		
									point39	39	1,562,053.8	11,974,422.0	5.00	25.00	0.00	0	0		
									point40	40	1,562,056.4	11,974,423.0	5.00	25.00	0.00	0	0		
									point41	41	1,562,059.5	11,974,399.0	5.00	25.00	0.00	0	0		
									point42	42	1,562,052.5	11,974,398.0	5.00	25.00	0.00	0	0		
									point43	43	1,562,055.6	11,974,369.0	5.00	25.00	0.00	0	0		
									point44	44	1,562,061.0	11,974,370.0	5.00	25.00	0.00	0	0		
									point45	45	1,562,062.2	11,974,351.0	5.00	25.00	0.00	0	0		
									point46	46	1,562,021.5	11,974,344.0	5.00	25.00					
Barrier2	W	0.00	99.99	0.00				0.00	point47	47	1,562,050.0	11,974,777.0	20.00	10.00	0.00	0	0		
									point48	48	1,562,055.0	11,974,739.0	20.00	10.00	0.00	0	0		
									point49	49	1,562,062.8	11,974,674.0	20.00	10.00	0.00	0	0		
									point50	50	1,562,067.2	11,974,624.0	20.00	10.00	0.00	0	0		
									point51	51	1,562,070.5	11,974,596.0	20.00	10.00	0.00	0	0		
									point52	52	1,562,074.4	11,974,546.0	20.00	10.00	0.00	0	0		
									point53	53	1,562,077.6	11,974,500.0	20.00	10.00	0.00	0	0		
									point54	54	1,562,084.4	11,974,420.0	20.00	10.00	0.00	0	0		
									point55	55	1,562,091.0	11,974,338.0	20.00	10.00					
Barrier3	W	0.00	99.99	0.00				0.00	point57	57	1,562,012.5	11,974,764.0	10.00	25.00	0.00	0	0		
									point58	58	1,562,012.9	11,974,751.0	10.00	25.00	0.00	0	0		
									point59	59	1,562,009.4	11,974,750.0	10.00	25.00	0.00	0	0		
									point60	60	1,562,010.8	11,974,741.0	10.00	25.00	0.00	0	0		
									point61	61	1,562,008.0	11,974,741.0	10.00	25.00	0.00	0	0		
									point62	62	1,562,011.9	11,974,712.0	10.00	25.00	0.00	0	0		
									point63	63	1,562,018.8	11,974,713.0	10.00	25.00	0.00	0	0		
									point64	64	1,562,020.0	11,974,692.0	10.00	25.00	0.00	0	0		
									point65	65	1,562,008.9	11,974,691.0	10.00	25.00	0.00	0	0		
									point66	66	1,562,012.2	11,974,655.0	10.00	25.00	0.00	0	0		
									point67	67	1,562,019.1	11,974,656.0	10.00	25.00	0.00	0	0		
									point68	68	1,562,021.1	11,974,635.0	10.00	25.00	0.00	0	0		
									point69	69	1,562,042.5	11,974,637.0	10.00	25.00	0.00	0	0		
									point70	70	1,562,029.0	11,974,769.0	10.00	25.00	0.00	0	0		
									point71	71	1,562,012.8	11,974,768.0	10.00	25.00					
Barrier4	W	0.00	99.99	0.00				0.00	point72	72	1,562,037.2	11,974,693.0	5.00	10.00	0.00	0	0		
									point73	73	1,562,058.5	11,974,695.0	20.00	10.00					
Barrier5	W	0.00	99.99	0.00				0.00	point74	74	1,562,031.5	11,974,750.0	5.00	10.00	0.00	0	0		
									point75	75	1,562,052.6	11,974,752.0	20.00	10.00					
Barrier6	W	0.00	99.99	0.00				0.00	point76	76	1,562,045.5	11,974,592.0	5.00	10.00	0.00	0	0		
									point77	77	1,562,069.4	11,974,595.0	20.00	10.00					
Barrier7	W	0.00	99.99	0.00				0.00	point78	78	1,562,041.8	11,974,542.0	5.00	10.00	0.00	0	0		
									point79	79	1,562,073.5	11,974,547.0	20.00	10.00					
Barrier8	W	0.00	99.99	0.00				0.00	point80	80	1,562,052.1	11,974,503.0	5.00	10.00	0.00	0	0		
									point81	81	1,562,076.9	11,974,507.0	20.00	10.00					
Barrier9	W	0.00	99.99	0.00				0.00	point82	82	1,562,043.8	11,974,464.0	5.00	10.00	0.00	0	0		
									point83	83	1,562,078.5	11,974,467.0	20.00	10.00					
Barrier10	W	0.00	99.99	0.00				0.00	point84	84	1,562,054.2	11,974,427.0	5.00	10.00	0.00	0	0		
									point85	85	1,562,083.4	11,974,429.0	20.00	10.00					

Barrier11	W	0.00	99.99	0.00				0.00	point86	86	1,562,054.0	11,974,387.0	5.00	10.00	0.00	0	0		
									point87	87	1,562,085.5	11,974,393.0	20.00	10.00					
Barrier12	W	0.00	99.99	0.00				0.00	point88	88	1,562,062.5	11,974,358.0	5.00	10.00	0.00	0	0		
									point89	89	1,562,087.9	11,974,360.0	20.00	10.00					
Barrier2-2	W	0.00	99.99	0.00				0.00	point90	90	1,562,091.0	11,974,338.0	20.00	6.00	0.00	0	0		
									point56	56	1,561,980.6	11,974,330.0	0.00	6.00					
Barrier14	W	0.00	99.99	0.00				0.00	point91	91	1,562,266.8	11,974,058.0	10.00	4.00	0.00	0	0		
									point92	92	1,562,236.1	11,974,272.0	10.00	4.00	0.00	0	0		
									point93	93	1,562,216.1	11,974,448.0	10.00	4.00	0.00	0	0		
									point94	94	1,562,188.6	11,974,670.0	10.00	4.00	0.00	0	0		
									point95	95	1,562,163.9	11,974,892.0	10.00	4.00	0.00	0	0		
									point96	96	1,562,130.4	11,975,105.0	10.00	4.00	0.00	0	0		
									point97	97	1,562,104.4	11,975,294.0	10.00	4.00					
Barrier15	W	0.00	99.99	0.00				0.00	point98	98	1,562,042.9	11,974,638.0	5.00	10.00	0.00	0	0		
									point99	99	1,562,064.4	11,974,639.0	20.00	10.00					
Barrier16	W	0.00	99.99	0.00				0.00	point100	100	1,562,006.5	11,974,249.0	0.00	20.00	0.00	0	0		
									point101	101	1,562,004.8	11,974,309.0	0.00	20.00	0.00	0	0		
									point102	102	1,562,034.4	11,974,310.0	0.00	20.00	0.00	0	0		
									point103	103	1,562,032.2	11,974,326.0	0.00	20.00	0.00	0	0		
									point104	104	1,562,065.2	11,974,328.0	0.00	20.00	0.00	0	0		
									point105	105	1,562,065.4	11,974,294.0	0.00	20.00	0.00	0	0		
									point106	106	1,562,049.6	11,974,294.0	0.00	20.00	0.00	0	0		
									point107	107	1,562,049.8	11,974,259.0	0.00	20.00	0.00	0	0		
									point108	108	1,562,037.8	11,974,259.0	0.00	20.00	0.00	0	0		
									point109	109	1,562,036.8	11,974,249.0	0.00	20.00	0.00	0	0		
									point110	110	1,562,006.5	11,974,249.0	0.00	20.00					
Barrier17	W	0.00	99.99	0.00				0.00	point111	111	1,562,048.9	11,974,785.0	20.00	8.00	0.00	0	0		
									point112	112	1,562,027.6	11,975,004.0	20.00	8.00					

<Organization?>			5 February 2020	
<Analysis By?>			TNM 2.5	
INPUT: TERRAIN LINES				
PROJECT/CONTRACT:	<Project Name?>			
RUN:	<Run Title?>			
Terrain Line	Points			
Name	No.	Coordinates (ground)		
		X	Y	Z
		ft	ft	ft
Terrain Line2	10	1,561,986.9	11,975,474.0	25.00
	11	1,562,061.1	11,974,814.0	25.00
	12	1,562,072.0	11,974,749.0	25.00
	13	1,562,073.5	11,974,706.0	25.00
	14	1,562,077.1	11,974,673.0	25.00
	15	1,562,079.5	11,974,633.0	25.00
	16	1,562,083.1	11,974,616.0	25.00
	17	1,562,090.5	11,974,582.0	25.00
	18	1,562,097.2	11,974,508.0	25.00
	19	1,562,100.9	11,974,443.0	25.00
	20	1,562,107.2	11,974,387.0	25.00
	21	1,562,111.8	11,974,352.0	25.00
	22	1,562,117.6	11,974,310.0	25.00
	23	1,562,168.5	11,974,087.0	25.00
Terrain Line3	24	1,562,054.1	11,975,075.0	10.00
	25	1,562,074.0	11,974,804.0	10.00
	26	1,562,084.2	11,974,723.0	10.00
	27	1,562,098.6	11,974,614.0	10.00
	28	1,562,111.0	11,974,524.0	10.00
	29	1,562,118.8	11,974,454.0	10.00
	30	1,562,127.4	11,974,389.0	10.00
	31	1,562,141.2	11,974,289.0	10.00

<Organization?>
<Analysis By?>

5 February 2020
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: <Project Name?>
RUN: <Run Title?>
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

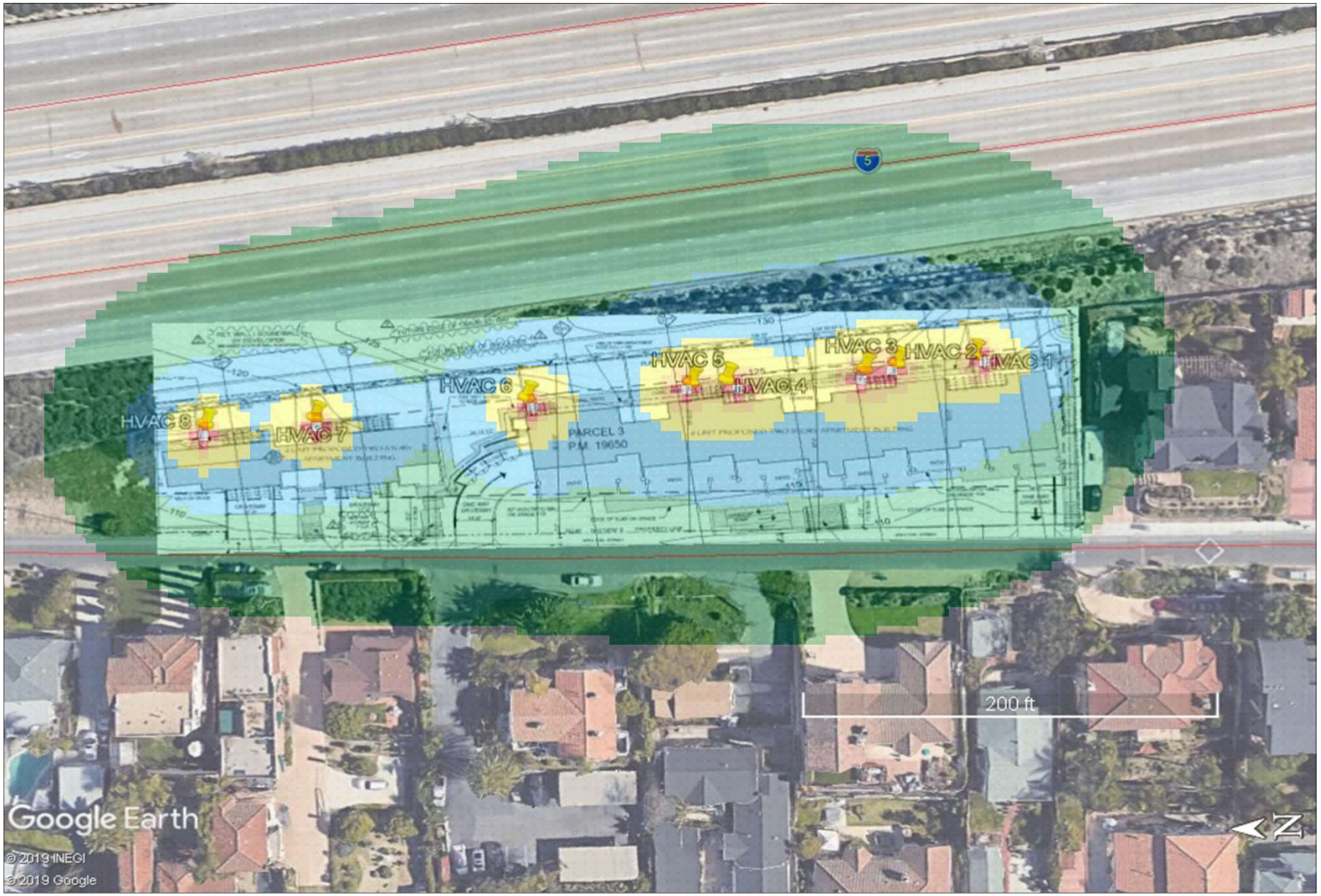
Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
ST1	1	1	0.0	59.6	66	59.6	10	----	59.6	0.0	8	-8.0
ST3	2	1	0.0	64.6	66	64.6	10	----	64.6	0.0	8	-8.0
ST2	3	1	0.0	61.5	66	61.5	10	----	61.5	0.0	8	-8.0
M1	5	1	0.0	61.0	66	61.0	10	----	61.0	0.0	8	-8.0
M2	6	1	0.0	60.4	66	60.4	10	----	60.4	0.0	8	-8.0
M3	7	1	0.0	64.5	66	64.5	10	----	64.5	0.0	8	-8.0
M4	8	1	0.0	60.7	66	60.7	10	----	60.7	0.0	8	-8.0
M5	9	1	0.0	60.4	66	60.4	10	----	60.4	0.0	8	-8.0
M6	10	1	0.0	65.0	66	65.0	10	----	65.0	0.0	8	-8.0
M7	11	1	0.0	61.5	66	61.5	10	----	61.5	0.0	8	-8.0
M8	12	1	0.0	61.3	66	61.3	10	----	61.3	0.0	8	-8.0
M9	13	1	0.0	65.3	66	65.3	10	----	65.3	0.0	8	-8.0
M10	14	1	0.0	62.8	66	62.8	10	----	62.8	0.0	8	-8.0
M11	15	1	0.0	61.6	66	61.6	10	----	61.6	0.0	8	-8.0
M12	16	1	0.0	66.1	66	66.1	10	Snd Lvl	66.1	0.0	8	-8.0
M13	17	1	0.0	59.9	66	59.9	10	----	59.9	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	16	0.0	0.0	0.0
All Impacted	1	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Appendix D

HVAC Operational Noise Model Output

Ida Avenue- HVAC Operational Noise Model



dBA range					
Color	High	Low	Color	High	Low
	65	60		50	45
	60	55		45	40
	55	50			

Appendix F
Trip Generation Assessment

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LINSCOTT
LAW &
GREENSPAN
engineers

Engineers & Planners
Traffic
Transportation
Parking

Linscott, Law & Greenspan, Engineers
4542 Ruffner Street
Suite 100
San Diego , CA 92111
858.300.8800 T
858.300.8610 F
www.llgengineers.com

Pasadena
Irvine
San Diego
Woodland Hills

March 3, 2021

Mr. Shantu Patel
1280 Hoover Street
Carlsbad, CA 92008

LLG Reference: 3-19-3106

Subject: **Ida Avenue Apartments Project – Trip Generation Assessment**
City of Solana Beach

Dear Mr. Patel:

Linscott, Law & Greenspan, Engineers (LLG) is pleased to provide this Trip Generation Assessment letter report for the proposed Ida Avenue Apartments Project (the "Project") to be located along the east side of Ida Avenue in the City of Solana Beach. The Project proposes to construct eight (8) apartment units on 0.89 acres of currently vacant land. ***Attachment A*** shows a project site plan.

The City of Solana Beach utilizes the published, regional San Diego Traffic Engineers Council (SANTEC)/ Institute of Transportation Engineers (ITE) "*Guidelines for Traffic Impact Studies [TIS] in the San Diego Region*" (March 2, 2000) to determine when a traffic impact study is warranted for a discretionary project. Section IV of that document is titled "Need for a Study", and states the following:

> *A TIS should be prepared for all projects which generate traffic greater than 1,000 total average daily trips (ADT) or 100 peak-hour trips. If a proposed project is not in conformance with the land use and/or transportation element of the general or community plan, use threshold rates of 500 ADT or 50 peak-hour trips.*

Thus, it is the project's trip generation (both ADT and peak hour trips) which is the primary determinant as to the need to conduct a TIS.

The property is zoned "Medium-High Residential 8-12 DU/Acre" in the City of Solana Beach General Plan. The proposed project is in conformance with the zoning and uses set out in the City of Solana Beach General Plan. Thus, according to the guidelines, ***if the project as proposed is calculated to generate less than 1,000 ADT or less than 100 peak hour trips, no traffic impact study would be required.*** The purpose of this letter report is to calculate and present the ADT and peak hour trips associated with the proposed Project.

Trip generation for the proposed development was calculated using the SANDAG *(Not So) Brief Guide to Vehicular Traffic Generation Rates for the San Diego Region*, April 2002. ***Table A*** tabulates the Project trip generation based on the SANDAG trip generation rate for apartments. As seen in *Table A*, the Project is calculated to generate 48 ADT with 4 AM

Philip M. Linscott, PE (1924-2000)
Jack M. Greenspan, PE (Ret.)
William A. Law, PE (Ret.)
Paul W. Wilkinson, PE
John P. Keating, PE
David S. Shender, PE
John A. Boarman, PE
Clare M. Look-Jaeger, PE
Richard E. Barretto, PE
Keil D. Maberry, PE

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peak hour trips and 4 PM peak hour trips. ***Therefore, based on the SANTEC/ITE Guidelines, a traffic impact study for the proposed project is not warranted.***

TABLE A
PROJECT TRIP GENERATION

Land Use	Size	Daily Trip Ends (ADTs) [a]		Peak Hour	% of ADT [b]	In:Out	Volume		
		Rate [b]	Volume			Split [b]	In	Out	Total
Apartments	8 Units	6 /unit	48	AM	8%	2:8	1	3	4
				PM	9%	7:3	3	1	4

Footnotes:

a. ADT = Average Daily Traffic.
b. Rates taken from the SANDAG *(Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region*, April 2002.

A qualitative Vehicle Miles Traveled Assessment (VMT) was conducted for the proposed project. The City of Solana Beach has not adopted SB 743 standards as of writing of this report. For the purposes of this project, the *Senate Bill (SB) 743 Office of Planning and Research (OPR) Technical Advisory* (December 2018) Screening thresholds for Small Projects was reviewed, which suggests that project that generate fewer than 110 trips per day[1] could be considered to not cause a significant VMT transportation impact. The proposed project generates less than half of the screening threshold and therefore expected to not cause a VMT impact. Furthermore, there are several existing bus stops in the project area that are served by NCTD Routes 308, 408, 101 that will help reduce the project's VMT.

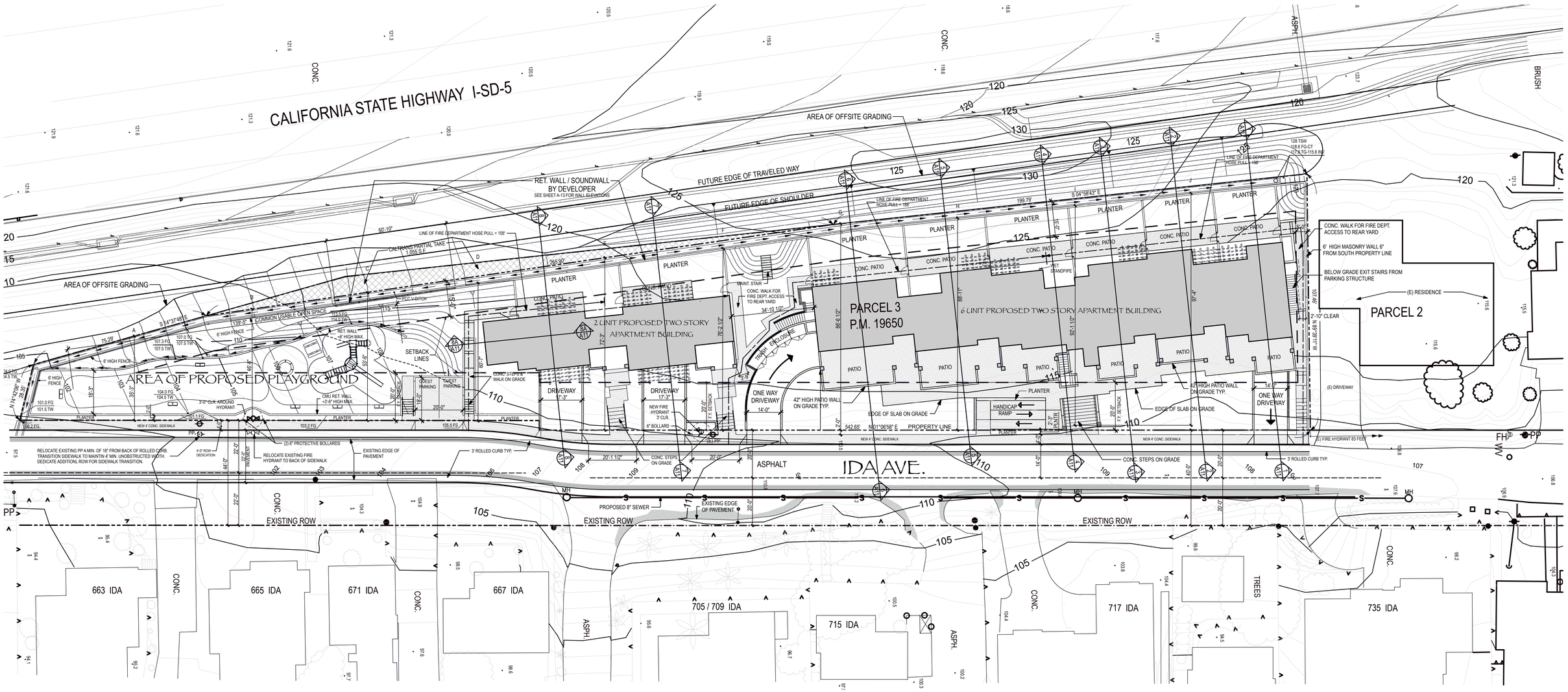
Sincerely,

Linscott, Law & Greenspan, Engineers

Shankar Ramakrishnan, P.E.
Associate Principal

[1] CEQA provides a categorical exemption for existing facilities, including additions to existing structures of up to 10,000 square feet, so long as the project is in an area where public infrastructure is available to allow for maximum planned development and the project is not in an environmentally sensitive area. (CEQA Guidelines, § 15301, subd. (e)(2).) Typical project types for which trip generation increases relatively linearly with building footprint (i.e., general office building, single tenant office building, office park, and business park) generate or attract an additional 110-124 trips per 10,000 square feet. Therefore, absent substantial evidence otherwise, it is reasonable to conclude that the addition of 110 or fewer trips could be considered not to lead to a significant impact.

Attachment A



N

SITE PLAN

SCALE 1"=20'-0"

BASE DENSITY

BASE DENSITY ALLOWED: 8-12 UNITS PER NET ACRE

NET SITE AREA: 38,904 SQ. FT = .89 ACRES.

UNITS ALLOWED: 7

UNITS PROPOSED: 8

SITE PLAN INFORMATION

APPLICANT: SHANTU PATEL; KNN MANAGEMENT LLC 760-214-8558

A.P.N. 298-162-37

ZONE: MHRd

PARKING SPACES REQUIRED: 18
PARKING SPACES PROVIDED: 18

GROSS LOT AREA: 40,833 SQ. FT.

NET LOT AREA: 38,904 SQ. FT. (-874 SQ. FT. FOR R.O.W. DEDICATION & -1,055 SQ. FT. FOR CALTRANS TAKE)

FIRST FLOOR LIVING AREA: 8,143 SQ. FT.

SECOND FLOOR LIVING AREA: 6,476 SQ. FT.

BASEMENT / GARAGE AREA: 10,887 SQ. FT. (NOT INLUDED IN F.A.R.)

EXTERIOR COVERED PATIO: 1,141 SQ. FT. (ENCLOSED 3 SIDES)

COMMON USABLE OPEN SPACE (PLAYGROUND): 3,044 SQ. FT.

GRADING INFORMATION

W C.Y. 8,710 SITE GRADING

X C.Y. 85 EXCAVATION FOR FOOTINGS

Y C.Y. 2,733 REMOVAL & RECOMPACTION

Z C.Y. 11,451 TOTAL GRADING (W+X+Y)

FRONT YARD SETBACK

FRONT YARD SETBACK MAY BE REDUCED FROM 25' TO 20' IF THE AVERAGE LOT DEPTH IS LESS THAN 100 FEET

A	35'-3"
B	46'-8"
C	53'-6"
D	60'-7"
E	72'-3"
F	79'-5"
G	86'-6"
H	91'-9"
I	97'-1"
J	102'-3"
TOTAL	725'-3" / 10 = 72'-6" (LESS THAN 100')

20' FRONT YARD SETBACK IS ALLOWED

REAR YARD SETBACK

REAR YARD SETBACK MAY BE REDUCED FROM 25' TO 15' IF THE AVERAGE LOT DEPTH IS LESS THAN 90 FEET

15' REAR YARD SETBACK IS ALLOWED

CHERESKIN ARCHITECTURE
DESIGN / PLANNING / INTERIORS
428 Andrew Ave., California, 92024 760/942-8287 760/ 942-1415 FAX

Ida Avenue Apartments

KNN MANAGEMENT LLC
1280 HOOVER STREET, CARLSBAD, CA 92008

ISSUED FOR PLAN CHECK

DATE:

BY:

DATE	REVISIONS

ALL DRAWINGS AND WRITTEN MATERIAL APPEARING HEREIN CONSTITUTE THE ORIGINAL AND UNPUBLISHED WORK OF THE ARCHITECT AND THE SAME MAY NOT BE DUPLICATED, USED OR DISCLOSED WITHOUT THE WRITTEN CONSENT OF THE ARCHITECT.

PROJECT NO.

DRAWN BY: SC

DATE 10-28-21

SHEET A-1

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Appendix G
AB 52 Consultation Documentation

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CITY OF SOLANA BEACH www.cityofsolanabeach.org
635 SOUTH HIGHWAY 101 • SOLANA BEACH, CA 92075 • (858) 720-2400 • Fax (858) 720-2455

June 23, 2021

Mario Morales
Mesa Grande Band of Mission Indians
PMB 366
35008 Pala Temecula Rd.
Pala, CA 92059

Subject: Ida Avenue Apartments located on the east side of Ida Avenue, City of Solana Beach (west of Interstate 5, south of Genevieve Street, north of Highland Drive), San Diego County

Dear Mr. Morales

The City of Solana Beach is preparing a cultural resources assessment for the proposed Ida Avenue Apartments Project in the City of Solana Beach (Proposed Project). The Proposed Project consists of a request for a Development Review Permit (DRP) and Structure Development Permit (SDP) to construct an eight-unit multi-family development. The vacant property is triangular in shape and located along the eastern side of Ida Avenue, west of Interstate 5, in the City of Solana Beach. The property is located within the Medium-High Residential (MHR) Zone, which allows for 8-12 dwelling units per acre. The Proposed Project encompasses approximately 1.44 acres and is inclusive of the 0.94-acre property as well as a 0.50-acre off-site area of temporary impacts.

The Proposed Project includes two (2) detached apartment buildings. The southernmost building would consist of six (6) attached two-story apartments built above a partially-subterranean 14-space shared parking garage with one-way access from the center of the lot to the southern end of the lot. The second building would be located to the north and consist of two (2) attached two-story apartments built above two (2) private two-car partially-subterranean garages. The northern end of the property would consists of a landscaped park and playground area.

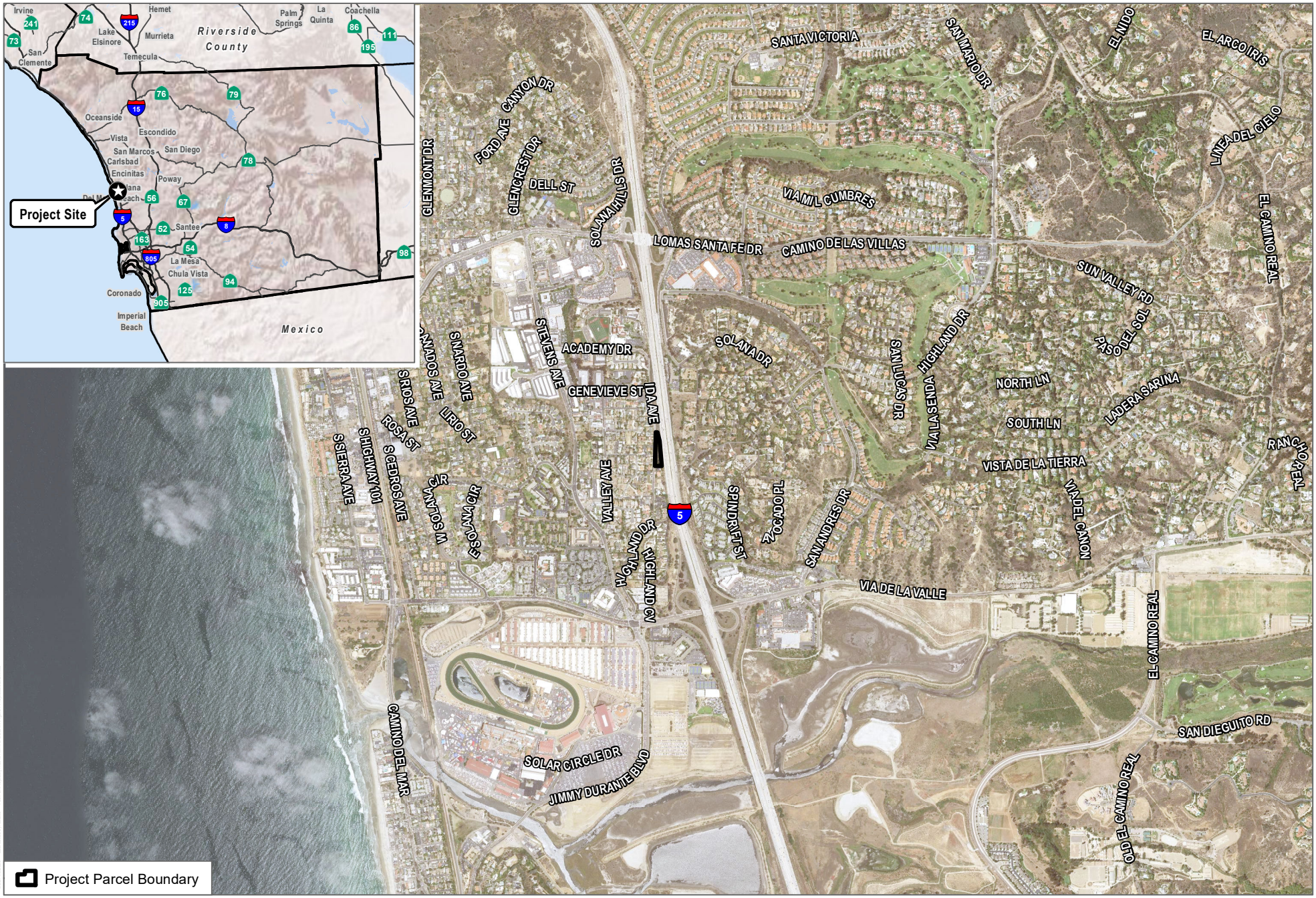
In accordance with AB 52, the City is contacting you as part of the government-to-government consultation process, in order to find out if you, or your tribal community, have any knowledge of cultural resources or places that may be impacted by the Proposed Project. If you have any information or concerns pertaining to such information, please contact me by phone at 858-720-2448 or by email at kbenson@cosb.org you have 30 days from the date of this letter to request AB 52 consultation.

Sincerely,

KBenson

Katie Benson
Senior Planner

Enclosures: Project Location Map



SOURCE: NAIP 2016

DUDEK

0 1,000 2,000 Feet

FIGURE 1

Project Location

Biological Resources Report for the Ida Avenue Project