1901 Royal Oaks Residential Project
Draft Initial Study/Mitigated Negative Declaration (IS/MND)

Prepared for:

City of Bradbury
Planning Department
600 Winston Avenue
Bradbury, California 91008

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TABLE OF CONTENTS

List of Figures

List of Tables

Appendices

I. INTRODUCTION

1. INTRODUCTION

The subject of this Initial Study is the proposed 1901 Royal Oaks Residential Project ("Project"), located in the City of Bradbury ("City"). The Project would involve the construction of 6 residential units on the southern portion of the Project Site. The Project is discussed in further detail in Section II, Project Description, of this Initial Study.

2. PROJECT INFORMATION

Project Title: 1901 Royal Oaks Residential Project

Project Applicant: YIHE California PTY. LTD.

Project Location: 1901 Royal Oaks Drive, Bradbury, CA 91008

Lead Agency: City of Bradbury
Planning Department
600 Winston Avenue
Bradbury, California 91008

3. PURPOSE AND CONTENTS OF THE INITIAL STUDY

An Initial Study is a preliminary analysis prepared for the City Bradbury as Lead Agency to determine whether an Environmental Impact Report or a Negative Declaration or Mitigated Negative Declaration must be prepared for a proposed project.

State CEQA Guidelines Section 15063 states:

(a) Following preliminary review, the Lead Agency shall conduct an Initial Study to determine if the project may have a significant effect on the environment. If the Lead Agency can determine that an EIR will clearly be required for the project, an Initial Study is not required but may still be desirable.

(1) All phases of project planning, implementation, and operation must be considered in the Initial Study of the project.

(2) To meet the requirements of this section, the lead agency may use an environmental assessment or a similar analysis prepared pursuant to the National Environmental Policy Act.

(3) An initial study may rely upon expert opinion supported by facts, technical studies or other substantial evidence to document its findings. However, an initial study is neither intended nor required to include the level of detail included in an EIR.

(b) Results.

(1) If the agency determines that there is substantial evidence that any aspect of the project, either individually or cumulatively, may cause a significant effect on the environment, regardless of whether the overall effect of the project is adverse or beneficial, the Lead Agency shall do one of the following:

(A) Prepare an EIR, or

(B) Use a previously prepared EIR which the Lead Agency determines would adequately analyze the project at hand, or

(C) Determine, pursuant to a program EIR, tiering, or another appropriate process, which of a project's effects were adequately examined by an earlier EIR or negative declaration. Another appropriate process may include, for example, a master EIR, a master environmental assessment, approval of housing and neighborhood commercial facilities in urban areas, approval of residential projects pursuant to a specific plans described in section 15182, approval of residential projects consistent with a community plan, general plan or zoning as described in section 15183, or an environmental document prepared under a State certified regulatory program. The lead agency shall then ascertain which effects, if any, should be analyzed in a later EIR or negative declaration.

(2) The Lead Agency shall prepare a Negative Declaration if there is no substantial evidence that the project or any of its aspects may cause a significant effect on the environment.

(c) Purposes. The purposes of an Initial Study are to:

(1) Provide the Lead Agency with information to use as the basis for deciding whether to prepare an EIR or a Negative Declaration.

(2) Enable an applicant or Lead Agency to modify a project, mitigating adverse impacts before an EIR is prepared, thereby enabling the project to qualify for a Negative Declaration.

(3) Assist in the preparation of an EIR, if one is required, by:

(A) Focusing the EIR on the effects determined to be significant,

(B) Identifying the effects determined not to be significant,

(C) Explaining the reasons for determining that potentially significant effects would not be significant, and

(D) Identifying whether a program EIR, tiering, or another appropriate process can be used for analysis of the project's environmental effects.

(4) Facilitate environmental assessment early in the design of a project;

(5) Provide documentation of the factual basis for the finding in a Negative Declaration that a project will not have a significant effect on the environment;

(6) Eliminate unnecessary EIRs; and

(7) Determine whether a previously prepared EIR could be used with the project.

(d) Contents. An Initial Study shall contain in brief form:

(1) A description of the project including the location of the project;

(2) An identification of the environmental setting;

(3) An identification of environmental effects by use of a checklist, matrix, or other method, provided that entries on a checklist or other form are briefly explained to indicate that there is some evidence to support the entries. The brief explanation may be either through a narrative or a reference to another information source such as an attached map, photographs, or an earlier EIR or negative declaration. A reference to another document should include, where appropriate, a citation to the page or pages where the information is found.

(4) A discussion of the ways to mitigate the significant effects identified, if any;

(5) An examination of whether the project would be consistent with existing zoning, plans, and other applicable land use controls; and

(6) The name of the person or persons who prepared or participated in the Initial Study.

(e) Submission of Data. If the project is to be carried out by a private person or private organization, the Lead Agency may require such person or organization to submit data and information which will enable the Lead Agency to prepare the Initial Study. Any person may submit any information in any form to assist a Lead Agency in preparing an Initial Study.

(f) Format. Sample forms for an applicant's project description and a review form for use by the lead agency are contained in Appendices G and H. When used together, these forms would meet the requirements for an initial study, provided that the entries on the checklist are briefly explained pursuant to subdivision (d)(3). These forms are only suggested, and public agencies are free to devise their own format for an initial study. A previously prepared EIR may also be used as the initial study for a later project.

(g) Consultation. As soon as a Lead Agency has determined that an Initial Study will be required for the project, the Lead Agency shall consult informally with all Responsible Agencies and all Trustee Agencies responsible for resources affected by the project to obtain the recommendations of those agencies as to whether an EIR or a Negative Declaration should be prepared. During or immediately after preparation of an Initial Study for a private project, the Lead Agency may consult with the applicant to determine if the applicant is willing to modify the project to reduce or avoid the significant effects identified in the Initial Study.

A “Mitigated Negative Declaration” is prepared for a project when the Initial Study has identified potentially significant effects on the environment, but (1) revisions in the project plans or proposals made by, or agreed to by, the applicant before the proposed 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 effect on the environment would occur, and (2) there is no substantial evidence in light of the whole record before the public agency that the project, as revised, may have a significant effect on the environment. As shown in the following environmental analysis contained in this Initial Study, the implementation of the Project could cause some potentially significant impacts on the environment, but these potentially significant impacts would be reduced to less than significant impacts by Project revisions in the form of mitigation measures. With regard to some other impacts, the Initial Study shows that no substantial evidence indicates that the proposed Project would have significant environmental impacts. Consequently, this Initial Study concludes that a Mitigated Negative Declaration shall be prepared for the proposed Project.

4. ORGANIZATION OF THE INITIAL STUDY

This Draft Initial Study is organized as follows:

Introduction: This section provides introductory information such as the Project title, the Project Applicant, and the designated Lead Agency for the proposed Project.

Project Description: This section provides a detailed description of the proposed Project including the environmental setting, Project characteristics, related Project information, Project objectives, and environmental clearance requirements.

Initial Study Checklist: This section contains the completed Initial Study Checklist showing the significance level under each environmental impact category.

Environmental Impact Analysis: This section contains an assessment and discussion of impacts for each environmental issue identified in the Initial Study Checklist. Where the evaluation identifies potentially significant effects, mitigation measures are provided to reduce such impacts to less than significant levels.

II. PROJECT DESCRIPTION

1. PROJECT APPLICANT

The Applicant for the 1901 Royal Oaks Residential (the "Project") is YIHE California PTY. LTD ("the Applicant").

2. ENVIRONMENTAL SETTING

A. Project Location

The 12.4-acre Project Site is located at 1901 Royal Oaks Drive in the City of Bradbury. ("Project Site"). See Figure II-1, Vicinity Map. The Project Site is developed on one lot with Accessor Parcel Number (APN) 8527-021-041. See Figure II-2, Aerial Photograph of Project Site. Regional access to the Project Site is provided by the 605 Freeway located approximately 0.5 miles southeast of the Project Site, and the 210 Freeway located approximately 0.6 miles south of the Project Site. Direct local access to the Project Site is provided by Royal Oaks Drive. Public bus transit service is provided by Foothill Transit Line 860 with the nearest bus stop located along Royal Oaks Drive, approximately 600 feet southwest from the Project Site.

B. Existing Land Uses

The northern portion of the Project Site is largely undeveloped and would not be altered as a result of the Project. The southern portion of the Project Site, which the Project will be developed within, is currently vacant. However, this portion of the Project Site was recently developed with a single-family residence, appurtenant structures, and horse corrals, all of which have been removed. The nearest uses to the Project Site include adjacent residences to the east, west, and north, and residences to the south along Royal Oaks Drive. Refer to Figure II-2, Aerial Photograph of the Project Site, for an aerial view of the Project Site and surrounding land uses.

C. Existing Project Site Zoning and Land Use Designations

The Project Site is zoned Agriculture Residential Estate (A-1) and has a General Plan designation of Residential Estate. The A-1 zone allows the following principle uses: single-family dwelling, open spaces, nurseries, orchards, vineyards, field crops, bush crops, gardening, small residential care facilities, and supportive and transitional housing. The A-1 zone requires a front, side, and back yard setback of 25 feet. Additionally, developments within an A-1 zone must not be located closer than 50 feet to any private street or vehicular easement serving more than two parcels of property.

3. PROJECT CHARACTERISTICS

A. Project Features

The Project would involve the construction of 6 residential units, totaling approximately 31,000 gross square feet, on the southern portion of the Project Site. The Project's plans are shown in Figures II-3 through II-16.

B. Green Building & Sustainability

The Project would meet the minimum requirements of the Green Building Code of the City of Bradbury and the CALGreen Code. Some measures that may be required for the Project would include, but are not limited to:

- Indoor and outdoor water use reductions (i.e., use of ultralow-flow toilets and low-flow metered faucets);
- Construction waste reduction, disposal and recycling;
- Use of energy efficient lighting;
- Use of Energy Star appliances;
- Use of high energy efficiency rooftop heating and conditioning systems;
- Use of water-saving pool filter;
- Use of leak detection system for swimming pool;
- Use of smart irrigation systems to avoid over-watering of landscape;
- Use of indigenous and/or water-appropriate plants in landscaping;
- Use of low-impact development measures using innovative design to filter and infiltrate stormwater runoff and reduce water sent to sewer systems; and
- Use of low-VOC paints, coatings, adhesives and sealants (to the maximum extent feasible).

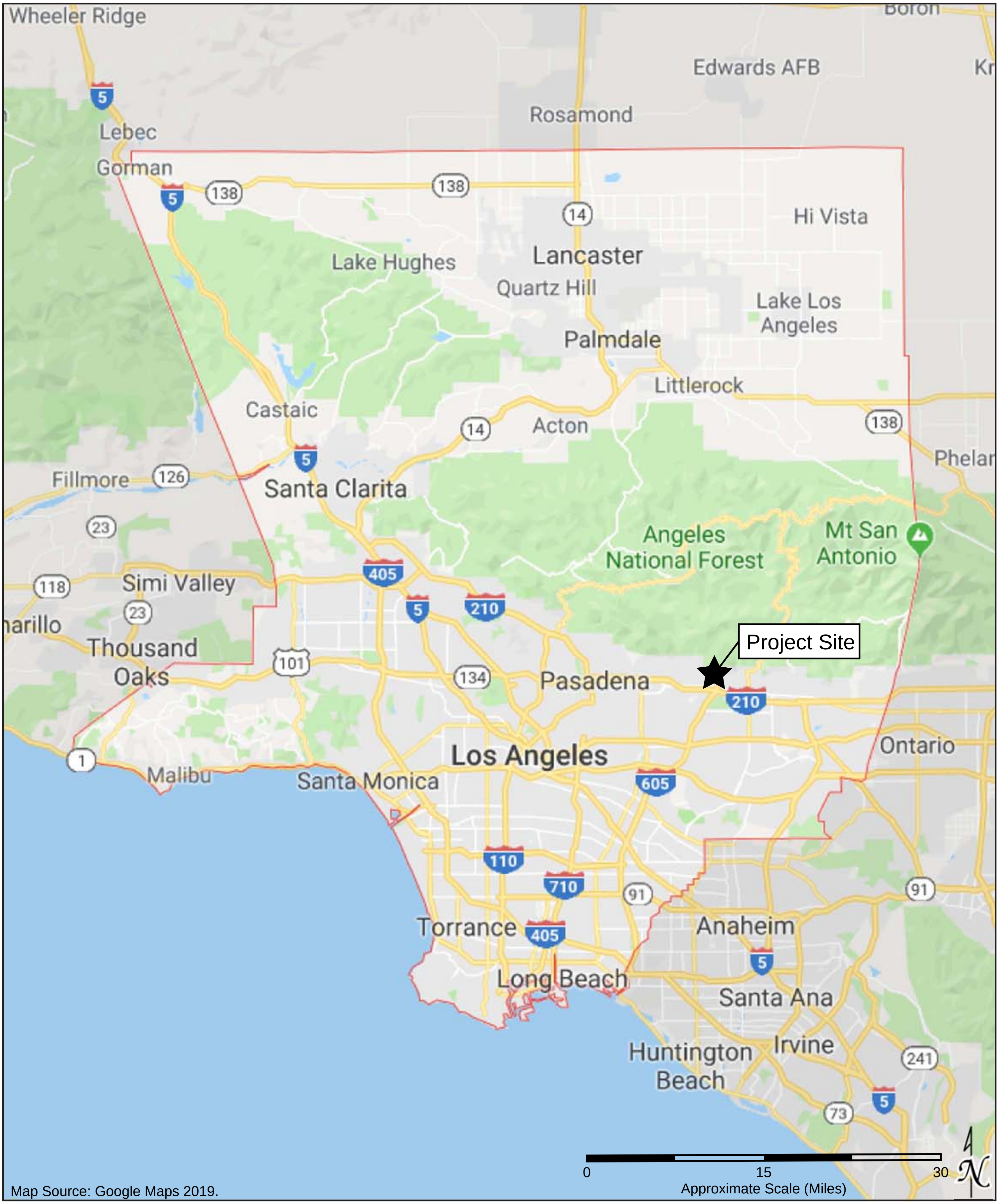
C. Construction

The Project would have a construction schedule of approximately 20 to 26 months. Shoring, grading, and site preparation would occur for approximately 2 months. Building construction would occur for approximately 18 to 24 months. This phase would include the construction of the proposed structures, connection of utilities, laying irrigation for landscaping, architectural coatings, and landscaping the Project Site.

4. DISCRETIONARY ACTIONS AND APPROVALS

To implement the Project, the following agreements, permits, and approvals are anticipated:

- Tentative Tract Map No. 73832
- Site Plan Review
- Grading Permit
- Building Permits
- SWPPP General Permit



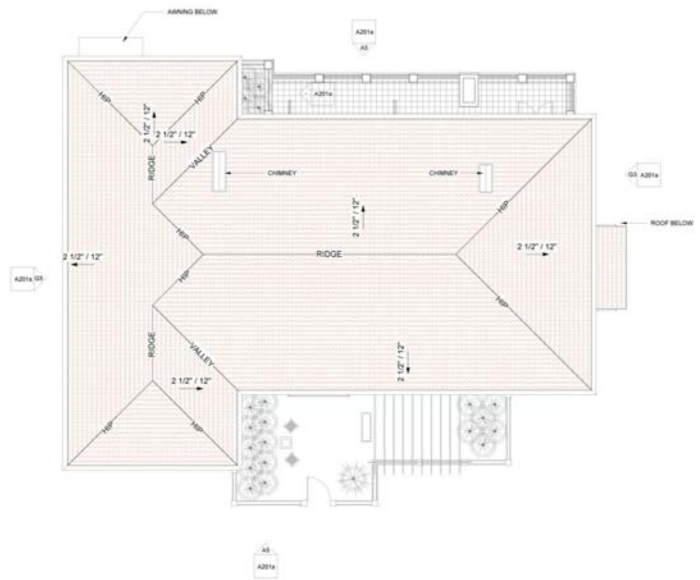
Map Source: Google Maps 2019.

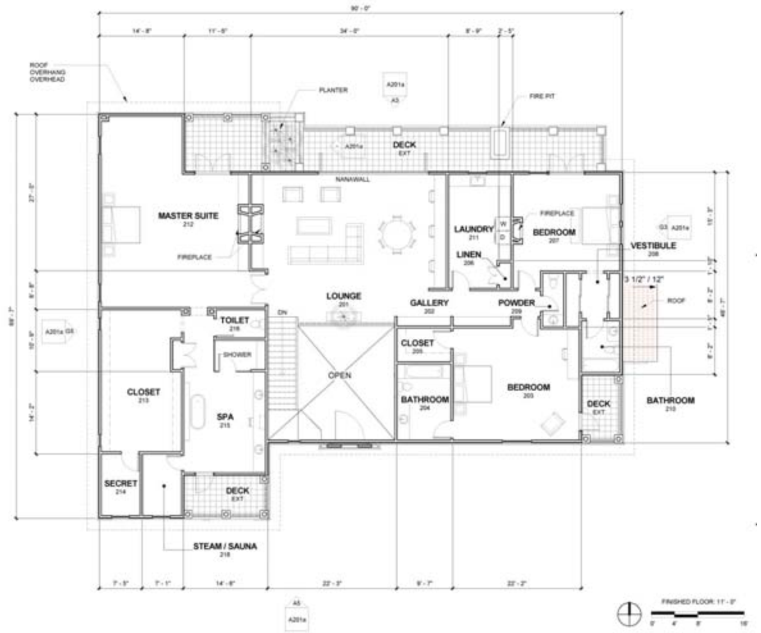
POMEROY ENVIRONMENTAL SERVICES

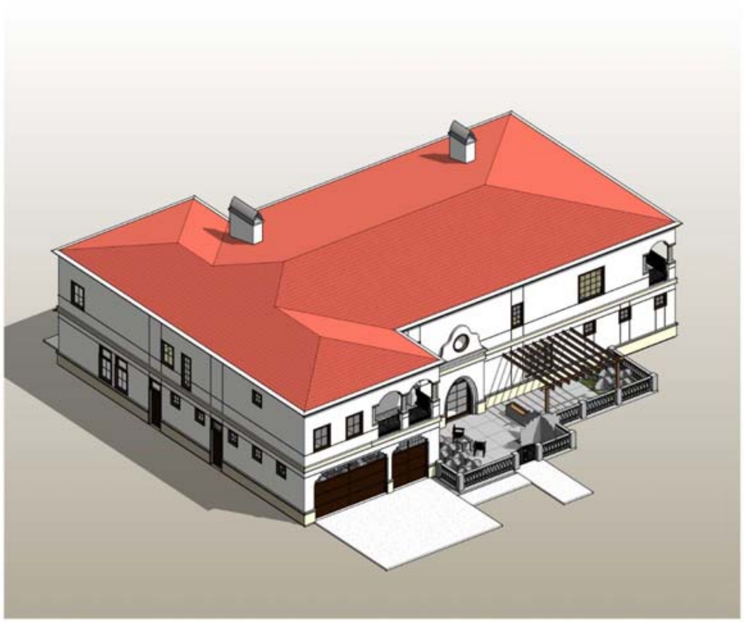
Figure II-1
Vicinity Map

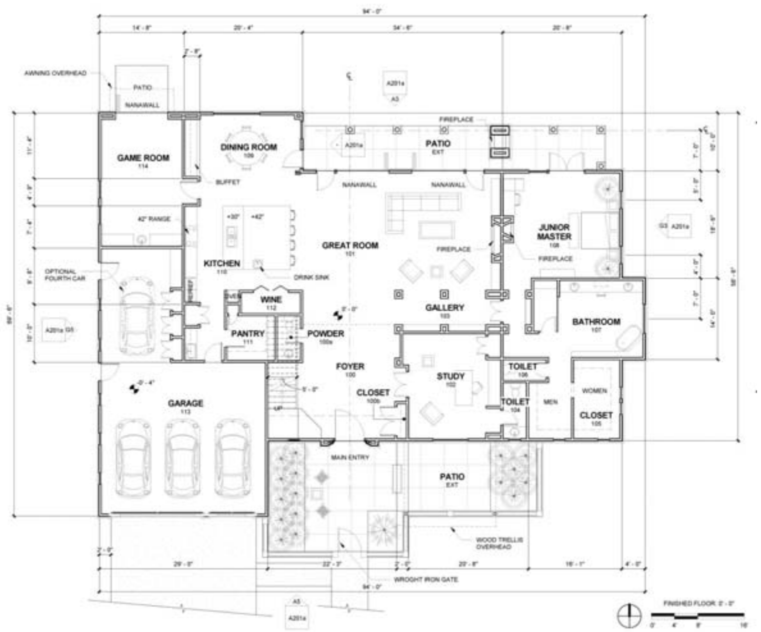
POMEROY ENVIRONMENTAL SERVICES

Figure II-2
Aerial Photograph of Project Site


ROOF PLAN - OPTION A G5


SECOND LEVEL - OPTION A A5

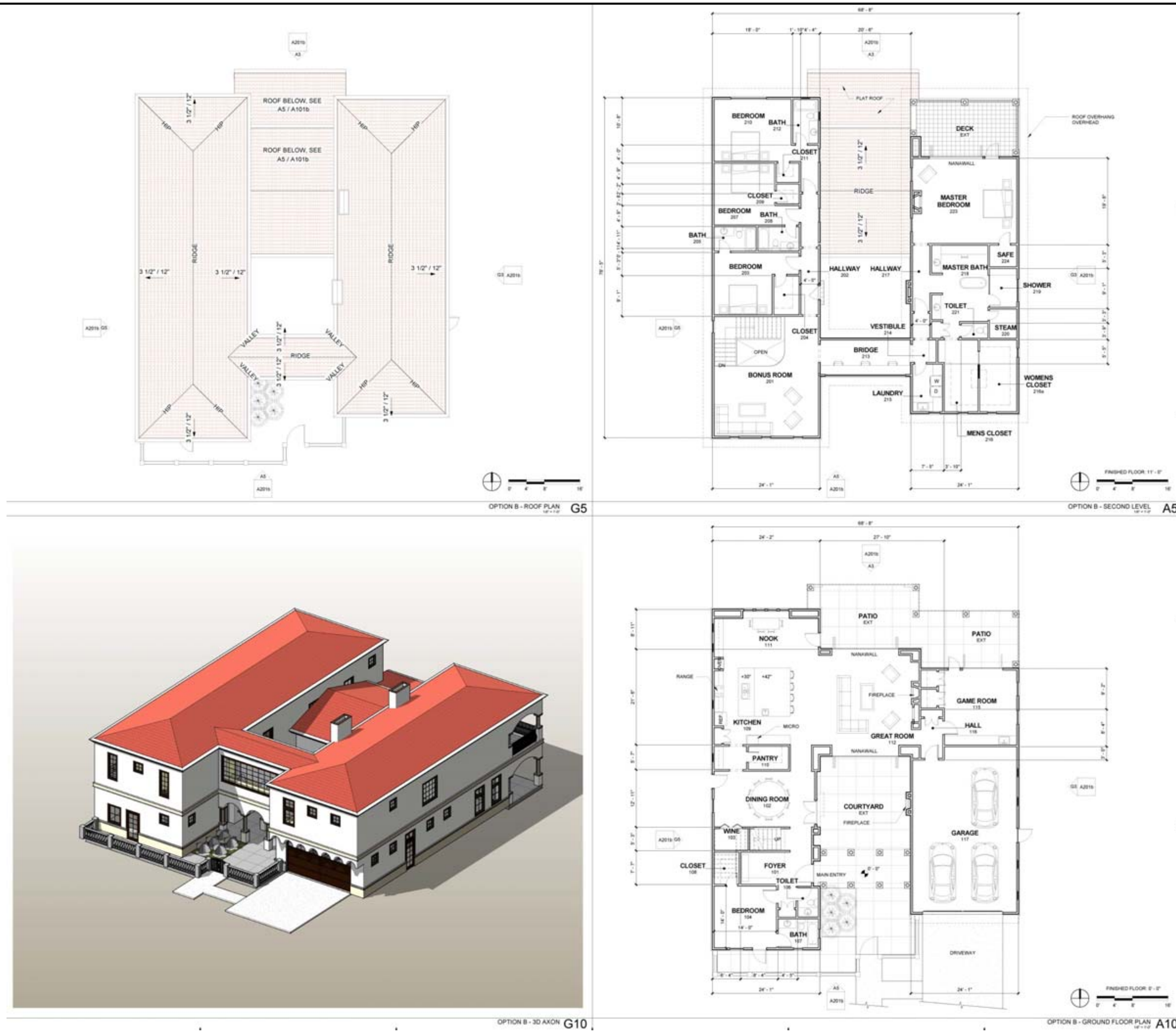

OPTION A - 3D AXON G10


GROUND LEVEL - OPTION A A10

Source: J. Bowen Causey Studio, 2019.

POMEROY ENVIRONMENTAL SERVICES

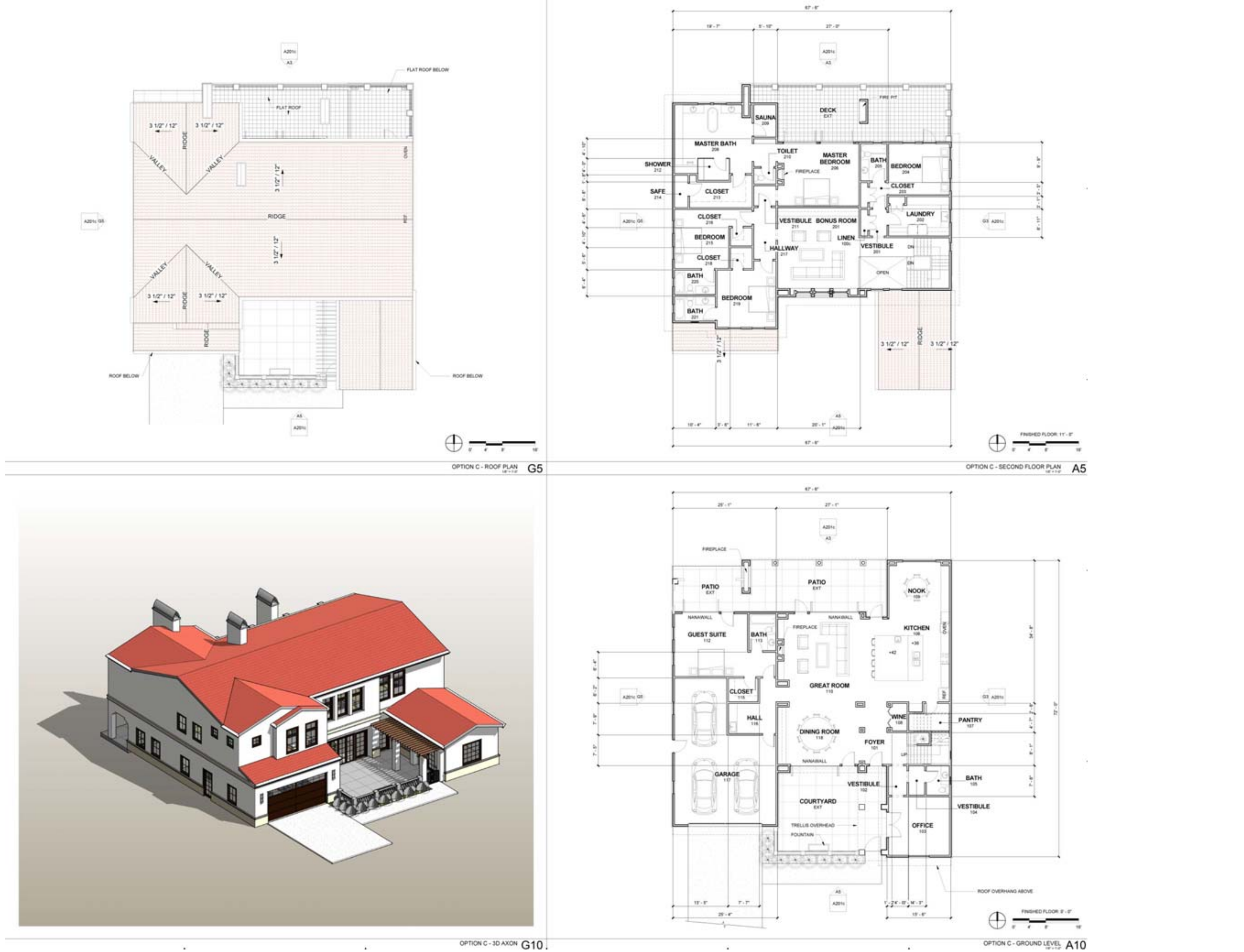
Figure II-3
Option A - Floor Plans and Roof Plan



Source: J. Bowen Causey Studio, 2019.

POMEROY ENVIRONMENTAL SERVICES

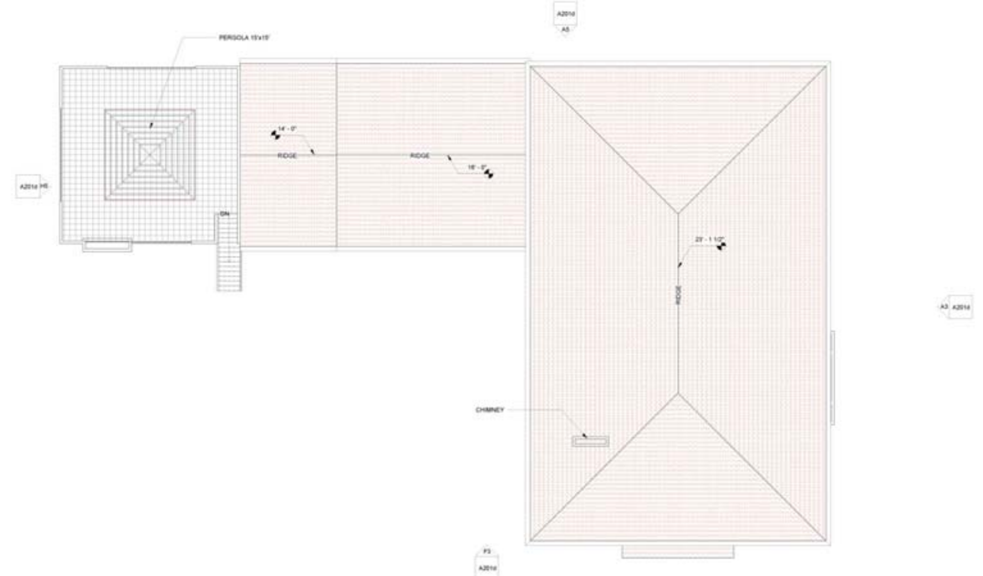
Figure II-4
Option B - Floor Plans and Roof Plan



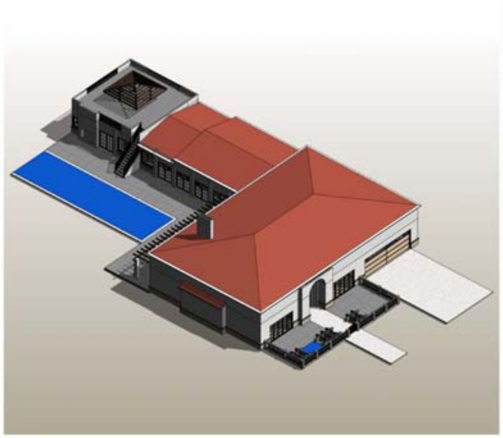
Source: J. Bowen Causey Studio, 2019.

PES POMEROY ENVIRONMENTAL SERVICES

Figure II-5
Option C - Floor Plans and Roof Plan



ROOF PLAN - OPTION D A5



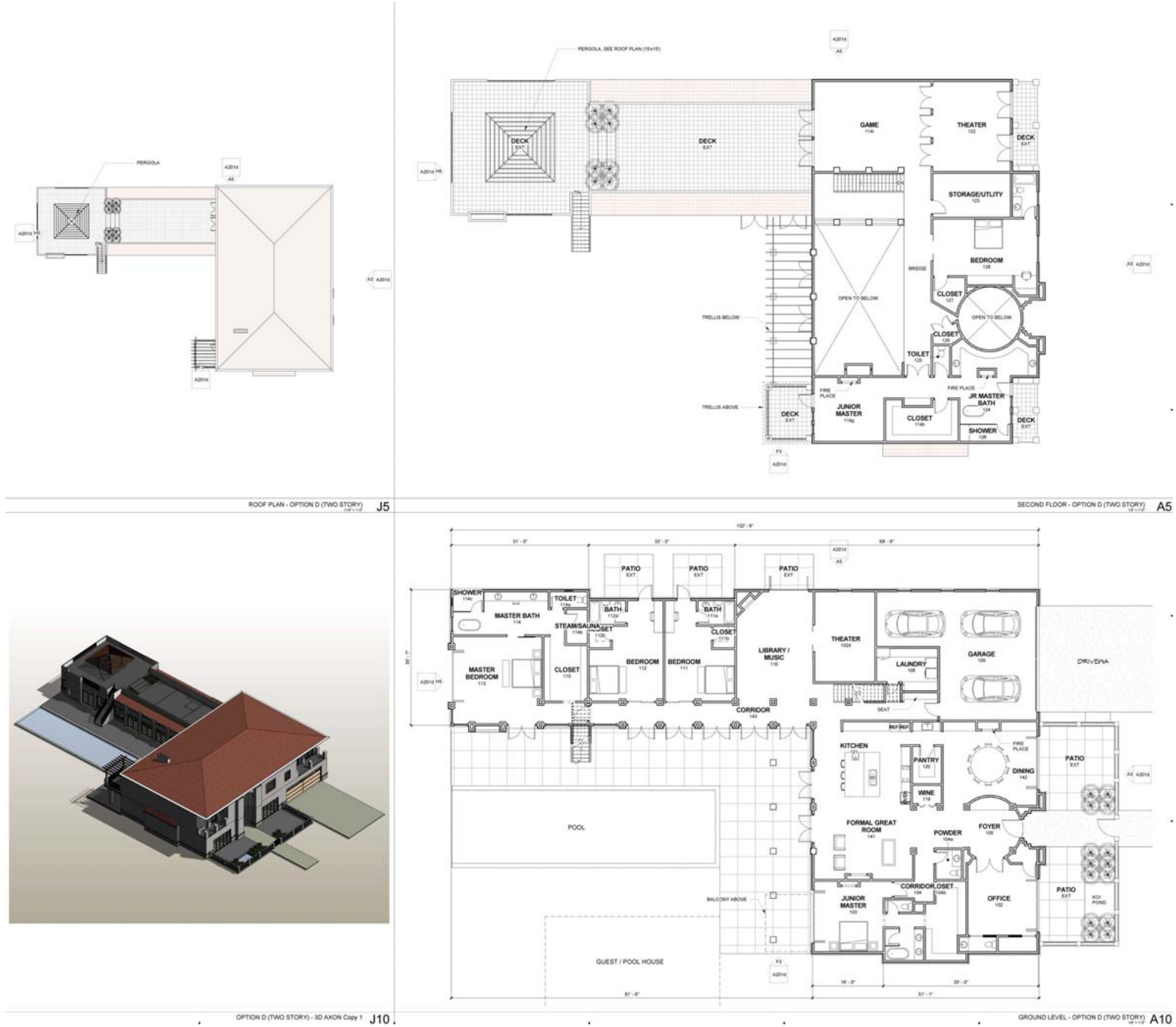
OPTION D - 3D AXON J10

GROUND LEVEL - OPTION D A10

Source: J. Bowen Causey Studio, 2019.

POMEROY ENVIRONMENTAL SERVICES

Figure II-6
Option D(1) - Floor Plans and Roof Plan



Source: J. Bowen Causey Studio, 2019.

POMEROY ENVIRONMENTAL SERVICES

Figure II-7
Option D(2) - Floor Plans and Roof Plan

Source: J. Bowen Causey Studio, 2019.

POMEROY ENVIRONMENTAL SERVICES

Figure II-8
Guest House Plans

Source: J. Bowen Causey Studio, 2019.

POMEROY ENVIRONMENTAL SERVICES

Figure II-9
Option A - Reflected Ceiling, Finish, and Power Plans

Source: J. Bowen Causey Studio, 2019.

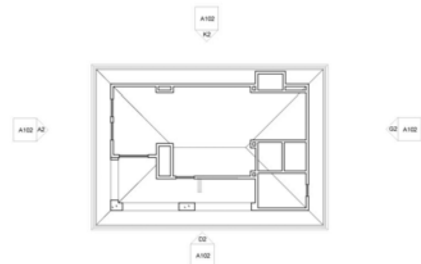
POMEROY ENVIRONMENTAL SERVICES

Figure II-10
Option B - Reflected Ceiling, Finish, and Power Plans

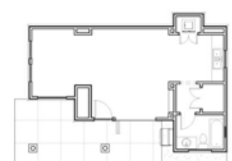
Source: J. Bowen Causey Studio, 2019.

POMEROY ENVIRONMENTAL SERVICES

Figure II-11
Option C - Reflected Ceiling, Finish, and Power Plans



GROUND LEVEL RCP - GUEST HOUSE A7



GROUND LEVEL - OPTION C - POWER/FINISH A10

Source: J. Bowen Causey Studio, 2019.

Figure II-12
Guest House - Reflected Ceiling, Finish, and Power Plans

OPTION A - EXTERIOR ELEVATION - EAST G3

OPTION A - EXTERIOR ELEVATION - NORTH A3

OPTION A - EXTERIOR ELEVATION - WEST G5

OPTION A - EXTERIOR ELEVATION - SOUTH A5

OPTION A - PRESPECTIVE BACK G10

OPTION A - 3D PERSPECTIVE FRONT A10

Source: J. Bowen Causey Studio, 2019.

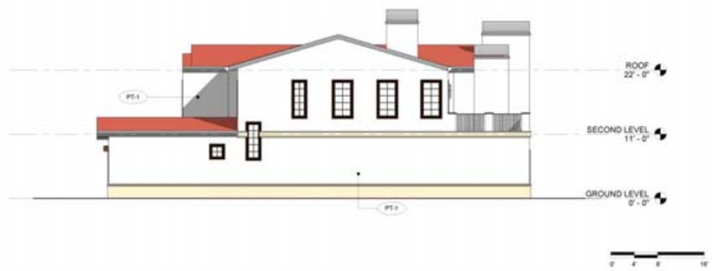
POMEROY ENVIRONMENTAL SERVICES

Figure II-13
Option A - Exterior Elevations

Source: J. Bowen Causey Studio, 2019.

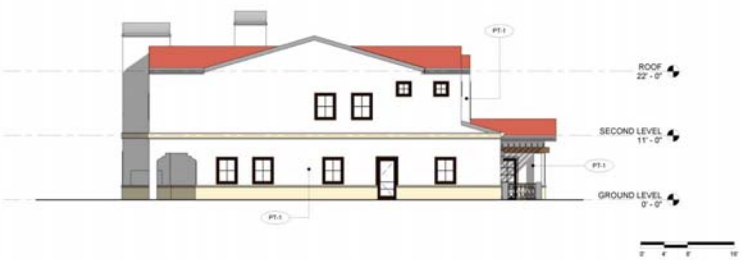
POMEROY ENVIRONMENTAL SERVICES

Figure II-14
Option B - Exterior Elevations



OPTION C - EXTERIOR ELEVATION - EAST G3

OPTION C - EXTERIOR ELEVATION - NORTH A3



OPTION C - EXTERIOR ELEVATIONS - WEST G5

OPTION C - EXTERIOR ELEVATIONS - SOUTH A5

OPTION C - 3D PERSPECTIVE BACK G10

OPTION C - 3D PERSPECTIVE FRONT A10

Source: J. Bowen Causey Studio, 2019.

POMEROY ENVIRONMENTAL SERVICES

Figure II-15
Option C - Exterior Elevations

Source: J. Bowen Causey Studio, 2019.

POMEROY ENVIRONMENTAL SERVICES

Figure II-16
Option D - Exterior Elevations

III. INITIAL STUDY CHECKLIST FORM

1. PROJECT INFORMATION

Project Title:

1901 Royal Oaks Residential Project

Project Applicant:

YIHE California PTY. LTD.

Project Location:

1901 Royal Oaks Drive, Bradbury, CA 91008

Lead Agency:

City of Bradbury, Planning Department, 600 Winston Avenue, Bradbury, California 91008

Lead Agency Contact Person:

Project Description:

The 12.4-acre Project Site is located at 1901 Royal Oaks Drive in the City of Bradbury. The Project Site is zoned Agriculture Residential Estate (A-1) and has a General Plan designation of Residential Estate. The Project would involve the construction of 6 residential units, totaling approximately 31,000 gross square feet, on the southern portion of the Project Site.

Determination (To be completed by Lead Agency)

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 on the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

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

☐ I find 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 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.

______________________________	City of Bradbury
Signature	**Agency**
______________________________	______________________________
Printed Name/Title	**Date**

Evaluation of Environmental Impacts:

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

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" or "Less Than Significant Impact with Mitigation Incorporated" as indicated by the checklist on the following pages.

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

		Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
PLEASE NOTE THAT EACH AND EVERY RESPONSE IN THE CITY OF LOS ANGELES INITIAL STUDY AND CHECKLIST IS SUMMARIZED FROM AND BASED UPON THE ENVIRONMENTAL ANALYSIS CONTAINED IN SECTION III OF THIS INITIAL STUDY. PLEASE REFER TO THE APPLICABLE RESPONSE IN SECTION III FOR A DETAILED DISCUSSION OF CHECKLIST DETERMINATIONS.					
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.	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?	❑	❑	☒	❑
II. AGRICULTURE AND FORESTRY RESOURCES In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:					
a.	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use?	❑	❑	❑	☒
b.	Conflict with existing zoning for agricultural use, or a Williamson Act contract?	❑	❑	☒	❑
c.	Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as	❑	❑	❑	☒

	defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?				
d.	Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e.	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒
III.	**AIR QUALITY** Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:				
a.	Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b.	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	☒	☐
c.	Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
d.	Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☒	☐
IV.	**BIOLOGICAL RESOURCES**				
a.	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b.	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☐	☒
c.	Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d.	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☒	☐	☐
e.	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☒	☐	☐
f.	Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒
V.	**CULTURAL RESOURCES**				
a.	Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5?	☐	☐	☐	☒
b.	Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	☐	☒	☐	☐
c.	Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☒	☐	☐
VI.	**ENERGY**				
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?	☐	☐	☒	☐
VII.	**GEOLOGY AND SOILS**				
a.	Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving:				
i.	Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
ii.	Strong seismic ground shaking?	☐	☒	☐	☐
iii.	Seismic-related ground failure, including liquefaction?	☐	☒	☐	☐
iv.	Landslides?	☐	☒	☐	☐
b.	Result in substantial soil erosion or the loss of topsoil?	☐	☒	☐	☐
c.	Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☒	☐	☐
d.	Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☒	☐	☐
e.	Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☒	☐	☐
f.	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐
VIII.	**GREENHOUSE GAS EMISSIONS**				
a.	Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b.	Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐
IX.	**HAZARDS AND HAZARDOUS MATERIALS**				
a.	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b.	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c.	Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐
d.	Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☒	☐
e.	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	☒
f.	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
g.	Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☒	☐
X.	**HYDROLOGY AND WATER QUALITY**				

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.	Impeded 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?	☐	☐	☒	☐
XI.	**LAND USE AND PLANNING**				
a.	Physically divide an established community?	☐	☐	☐	☒
b.	Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☒	☐
XII.	**MINERAL RESOURCES**				
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?	☐	☐	☐	☒
XIII.	**NOISE**				
a.	Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☒	☐	☐
b.	Generation of excessive groundborne vibration or groundborne noise levels?	☐	☒	☐	☐
c.	For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within 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?	☐	☐	☐	☒
XIV.	**POPULATION AND HOUSING**				
a.	Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☒	☐
b.	Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
XV.	**PUBLIC SERVICES**				

Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:					
a.	Fire protection?	❑	❑	☒	❑
b.	Police protection?	❑	❑	☒	❑
c.	Schools?	❑	❑	☒	❑
d.	Parks?	❑	❑	☒	❑
e.	Other public facilities?	❑	❑	☒	❑
XVI.	**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?	❑	❑	❑	☒
XVII.	**TRANSPORTATION**				
a.	Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	❑	❑	☒	❑
b.	Conflict or be inconsistent with CEQA Guidelines 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?	❑	❑	☒	❑
XVIII. TRIBAL CULTURAL RESOURCES Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:					
a.	Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	❑	☒	❑	❑
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 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	❑	☒	❑	❑
XIX.	**UTILITIES AND SERVICE SYSTEMS**				
a.	Require or result in the relocation or construction of new or expanded water, or wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities or expansion of existing facilities, the construction or relocation of which could cause significant environmental effects?	❑	❑	☒	❑
b.	Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	❑	❑	☒	❑
c.	Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	❑	❑	☒	❑
d.	Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	❑	❑	☒	❑

e.	Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	❑	❑	☒	❑
XX. 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?	❑	❑	☒	❑
XXI. 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 a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	❑	☒	❑	❑
b.	Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	❑	❑	☒	❑
c.	Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	❑	☒	❑	❑

IV. ENVIRONMENTAL IMPACT ANALYSIS

INTRODUCTION

This section of the Initial Study/Mitigated Negative Declaration (IS/MND) contains an assessment and discussion of impacts associated with each environmental issue and subject area identified in the Initial Study Checklist. The thresholds of significance are based on the 2019 CEQA Guidelines Appendix G Environmental Checklist Form and the *L.A. CEQA Thresholds Guide* (2006).

1. AESTHETICS

a) Would the project have a substantial adverse effect on a scenic vista?

Less Than Significant Impact. There are no officially designated scenic vistas within the City. However, the Bradbury Municipal Code (Municipal Code) defines public vistas as “Any significant public vista or view corridor as seen from a secondary, collector, or major arterial” and states that such vistas “should be protected and enhanced where feasible.”[1] Portions of the Project Site may be visible from nearby roadways, such as Royal Oaks Drive, Bradbury Hills Road, and Woodlyn Lane. The proposed residences would be developed on the southern portion of the Project Site while the northern hillside portion would be retained as open space. As such, views of the proposed residences would be constricted by the existing residences along Royal Oaks Drive, while the currently visible open space would remain unchanged from views along Royal Oaks Drive. Moreover, the proposed residences would be a maximum of two stories in height and would therefore not impede views of the northern portion of the Project Site. Bradbury Hills Road and Woodlyn Lane extend along the hillside adjacent to the northern boundary of the Project Site. Views of the San Gabriel Valley may be experienced to the south from these roadways. However, because these roadways are situated north of the Project Site and are higher in elevation than the proposed development area, views from Bradbury Hills Road and Woodlyn Lane would not be obstructed by the proposed residences. Moreover, the proposed residences would not involve any development on the ridgeline located near the northern site boundary.

The Project Site may also be visible from the Duarte Bike Trail, which is located just south of the Los Angeles County Flood Control District (LACFCD) wash that borders the southern boundary of the Project Site, and north of the residences along Royal Oaks Drive. The trail is separated from the Project Site by the wash and two chain-link fences that are located on the north and south sides of the wash. While the Project would involve an intensification of development on the Project Site and would change the appearance of the southern portion of the Project Site, the undeveloped hillside visible to the north would remain in place. The proposed residential units would be a maximum of two stories in height and would therefore not impede views of the northern portion of the Project Site. Moreover, the individual proposed residences would be located on lots of one to two acres, thereby preserving the rural, low-density character of the area. Thus, impacts on scenic vistas would be **less than significant**.

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[1] *City of Bradbury, Municipal Code Section 9.97.190, website: http://www.cityofbradbury.org/city-services/municipal-code, accessed: October 2019.*

b) Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

No Impact. The nearest officially designated State Scenic Highway is a portion of State Highway 2 that extends through the San Gabriel Mountains, beginning just north of the City of La Cañada Flintridge. The portion of State Highway 2 that is officially designated as a State Scenic Highway is located approximately 10 miles northwest of the Project Site. Due to this distance, the Project Site is not within the viewshed of this State Scenic Highway. Therefore, **no impact** on scenic resources within a state scenic highway would occur as a result of implementing the proposed Project.

c) Would the project substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). For a project in an urbanized area, would it conflict with applicable zoning and other regulations governing scenic quality?

Less Than Significant Impact. The Project would alter the existing visual character and quality of the southern portion of the Project Site by constructing 6 residential units and a private street. The proposed construction activities would introduce the use of machinery such as dump trucks, excavators, concrete trucks, scissor lifts, and other equipment required for construction activities. The presence of the construction equipment, as well as the construction activities associated with the Project such as grading, would temporarily alter the visual character of the Project Site and would be visible to the surrounding areas. However, since construction activities would be temporary, no substantial long-term degradation of views would occur due to Project construction.

The Municipal Code states that "views of significant visual features as seen from both within and outside a hillside development should be preserved."[2] During Project operation, the northern portion of the Project Site, which currently consists of an undeveloped hillside, would be retained as open space. The southern portion of the Project Site would undergo a change in visual character and quality as the Project would construct 6 residential units and a private street. However, because this area of the Project Site has previously been developed with light residential uses, orchards, and horse corrals, the addition of residential units on the Project Site would not create a substantial degradation in the visual character or quality of the Project Site. The proposed residential units would be a maximum of two stories in height and would therefore not impede views of the northern portion of the Project Site. Moreover, the individual proposed residences would be located on lots of one to two acres, thereby preserving the rural, low-density character of the area. For these reasons, impacts would be **less than significant**. No mitigation is anticipated to be required.

d) Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Less Than Significant Impact. The Project involves rural residential development, which is typically characterized by lower levels of light and glare relative to urbanized areas. Moreover, single-family residential developments are located to the north, east, south, and west of the Project Site. As such, the introduction of six new residential units to the Project area would not create a new source of substantial

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[2] *City of Bradbury, Municipal Code Section 9.97.190, website: http://www.cityofbradbury.org/city-services/municipal-code, accessed: October 2019.*

light or glare to the extent that day or nighttime views in the area would be adversely affected. Furthermore, exterior lighting for the proposed Project would be required to comply with Chapter 9.100.100 of the Municipal Code, which requires lighting to be hooded and to be reflected away from adjoining properties and streets.[3] Due to the consistency of the proposed Project with the surrounding land uses, and upon compliance with the lighting provisions established in the Municipal Code, effects related to light and glare would be **less than significant**.

2. AGRICULTURE AND FORESTRY RESOURCES

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

No Impact. The Project Site is not designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance.[4] As such, the Project would not convert any Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to a non-agricultural use, and **no impact** would result.

b) Would the project conflict with existing zoning for agricultural use, or a Williamson Act Contract?

Less Than Significant Impact. No areas that are under a Williamson Act contract exist on the Project Site.[5] However, the Project Site is zoned Agriculture Residential Estate (A-1). As early as 1952, the southern portion of the Project Site was an orchard. The orchards began to be replaced with horse corrals around 2002.[6] The previously existing uses within the southern portion of the Project Site have been removed to allow the construction of the proposed Project's 6 residential units. As such, the potential to return the site to orchard land uses would be precluded. However, residential uses are allowed within the Agriculture Residential Estate zoning district, and properties zoned for A-1 are not required to support agricultural land uses. For these reasons, it would not conflict with the zoning of the Project Site. Impacts would be **less than significant**.

c) Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12222(g)), timberland (as defined by Public Resources Code

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3 *City of Bradbury, Municipal Code Section 9.100.100, website: http://www.cityofbradbury.org/city-services/municipal-code, accessed: October 2019.*

4 *California Department of Conservation, Los Angeles County Important Farmland 2016, website: ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2016/los16.pdf, accessed: October 2019.*

5 *California Department of Conservation, The California Land Conservation Act of 1965, 2016 Status Report, published December 2016, website: https://www.conservation.ca.gov/dlrp/wa/Documents/stats_reports/2016%20LCA%20Status%20Report.pdf, accessed: October 2019.*

6 *Nationwide Environmental Title Research (NETR), Historic Aerials, website: https://www.historicaerials.com/viewer, accessed: October 2019.*

section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?

No Impact. Zoning districts within the City consist of single-family residential zones, agriculture residential estate zones, and an open space zone. As such, the City does not contain zoning for forest land, timberland, or timberland production areas. While the Project Site supports numerous trees, no forest land, timberland, or Timberland Production areas (as defined in California Public Resources Code Sections 12220(g), 4526, and 51104(g) and Government Code section 51104(g)) are located within or adjacent to the Project area. Therefore, the proposed Project would not conflict with existing zoning for forest land, timberland, or Timberland Production areas, or result in the loss or conversion of forest lands to non-forest uses, as none exist. **No impact** to forest land or timberland would occur.

d) Would the project result in the loss of forest land or conversion of forest land to non-forest use?

No Impact. As characterized above, no forest land is located on the Project Site; as such, no forest land would be converted or otherwise affected by the proposed Project, and **no impact** would occur.

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

No Impact. The Project Site is bordered to the east and west by properties zoned A-1. These properties may support some equestrian-related uses. However, the proposed Project would not result in removal or conversion of these adjacent uses. Moreover, no farmland or forest land would be otherwise converted to a non-agricultural or non-forest use. **No impact** would occur.

3. AIR QUALITY

a) Would the project conflict with or obstruct implementation of the applicable air quality plan?

Less Than Significant Impact. The South Coast Air Quality Management District SCAQMD is directly responsible for reducing emissions from stationary (area and point), mobile, and indirect sources to meet federal and State ambient air quality standards. It has responded to this requirement by preparing a series of Air Quality Management Plans (AQMPs). The most recent of these was adopted by the Governing Board of the SCAQMD on March 3, 2017. This AQMP, referred to as the 2016 AQMP, was prepared to comply with the federal and State Clean Air Acts and amendments, to accommodate growth, to reduce the high levels of pollutants in the Basin, to meet federal and State air quality standards, and to minimize the fiscal impact that pollution control measures have on the local economy. The 2016 AQMP identifies the control measures that will be implemented over a 15-year horizon to reduce major sources of pollutants. Implementation of control measures established in the previous AQMPs has substantially decreased the population's exposure to unhealthful levels of pollutants, even while substantial population growth has occurred within the Basin. The future air quality levels projected in the 2016 AQMP are based on several assumptions. For example, the SCAQMD assumes that general new development within the Basin will occur in accordance with population growth and transportation projections identified by the Southern California Association of Governments (SCAG) in its most current version of the Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), which was adopted April 7, 2016. The 2016 AQMP also assumes that general development projects will include strategies (mitigation measures) to reduce emissions generated during construction and operation in accordance with SCAQMD and local jurisdiction regulations, which are designed to address air quality impacts and pollution control measures. The Project would comply with all SCAQMD rules and regulations that are applicable to the Project; the Project Applicant is not requesting any exemptions from the currently adopted or proposed SCAQMD rules.

The Project would involve the construction of 6 residential units, totaling approximately 31,000 gross square feet, on the southern portion of the Project Site. The Project's 6 residential units would result in a net increase of approximately 18 residents.[7] SCAG estimates the population of the City will increase from 1,100 in 2012 to 1,200 residents by 2040, a 9.1 percent increase.[8] As such, the Project's addition of 18 residents would not conflict with the residential growth projections for the City. In addition, and further discussed herein, the Project would not violate any air quality standard or contribute substantially to an existing or projected air quality violation. Thus, the Project would not impair implementation of the AQMP, and this impact would be **less than significant**.

b) Would the project violate any air quality standard or result in a cumulatively considerable net increase in an existing or projected air quality violation?

Less Than Significant Impact. A significant impact may occur if a project would add a considerable cumulative contribution to federal or State non-attainment pollutant. Measurements of ambient concentrations of the criteria pollutants are used by the U.S. EPA and the California Air Resources Board (ARB) to assess and classify the air quality of each air basin, county, or, in some cases, a specific urbanized area. The classification is determined by comparing actual monitoring data with national and State standards. If a pollutant concentration in an area is lower than the standard, the area is classified as being in "attainment." If the pollutant exceeds the standard, the area is classified as a "non-attainment" area. If there is not enough data available to determine whether the standard is exceeded in an area, the area is designated "unclassified." Attainment status of the Basin with regard to the national ambient air quality standards (NAAQS) and California ambient air quality standards (CAAQS) are shown in Table IV-1, Attainment Status for the South Coast Air Basin. As shown, the Basin is in nonattainment for ozone, PM_{10} and $PM_{2.5.}$

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7 *Based on recent estimates for average household size in the City of Bradbury (3.0 persons per household). Source: City-Data, Bradbury, California, website: http://www.city-data.com/city/Bradbury-California.html, accessed: October 2019.*

8 *Southern California Association of Governments, 2016-2040 Regional Transportation Plan/Sustainable Communities Strategies, Demographics and Growth Forecast Appendix, Adopted April 2016, website: http://scagrtpscs.net/Documents/2016/final/f2016RTPSCS_DemographicsGrowthForecast.pdf, page 24 accessed: October 2019.*

Table IV-1
Attainment Status for the South Coast Air Basin

Pollutant	Attainment Status	
	NAAQS	CAAQS
Ozone (1-Hour)	Non-Attainment (Extreme)	Non-Attainment
Ozone (8-Hour)	Pending – Expect Non-Attainment (Extreme)	Non-Attainment
Carbon Monoxide (1- & 8-hour)	Attainment (Maintenance)	Attainment
Nitrogen Dioxide (1-Hour)	Unclassifiable/Attainment	Attainment
Nitrogen Dioxide (Annual)	Attainment (Maintenance)	Attainment
Sulfur Dioxide (1-Hour)	Designations Pending (expect Unclassified/Attainment)	Attainment
Sulfur Dioxide (24-Hour & Annual)	Unclassified/Attainment	attainment
PM_{10} (24-Hour)	Attainment (Maintenance)	Non-Attainment
PM_{10} (Annual)	N/A	Non-Attainment
$PM_{2.5}$ (24-Hour)	Non-Attainment (Serious)	N/A
$PM_{2.5}$ (Annual)	Non-Attainment (Moderate)	Non-Attainment
Lead	Non-Attainment (Partial)	Attainment

Source: SCAQMD, Air Quality Management Plan Appendix II website: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/appendix-ii.pdf?sfvrsn=4, accessed: October 2019.

Because the South Coast Air Basin is currently in nonattainment for ozone, PM_{10} and $PM_{2.5}$, related projects may exceed an air quality standard or contribute to an existing or projected air quality exceedance. With respect to determining the significance of the Project contribution, the SCAQMD neither recommends quantified analyses of construction and/or operational emissions from multiple development projects nor provides methodologies or thresholds of significance to be used to assess the cumulative emissions generated by multiple cumulative projects. Instead, the SCAQMD recommends that a project's potential contribution to cumulative impacts be assessed utilizing the same significance criteria as those for project specific impacts. Furthermore, the SCAQMD states that if an individual development project generates less-than-significant construction or operational emissions impacts, then the development project would not contribute to a cumulatively considerable increase in emissions for those pollutants for which the Basin is in nonattainment.[9]

A project may have a significant impact if project-related emissions would exceed federal, state, or regional standards or thresholds, or if project-related emissions would substantially contribute to an existing or projected air quality violation. The Project Site is located in the South Coast Air Basin (Basin). The South Coast Air Quality Management District (SCAQMD) is the air pollution control agency for the Basin. To address potential impacts from construction and operational activities, the SCAQMD currently recommends that impacts from projects with mass daily emissions that exceed any of the thresholds outlined in Table IV-2, SCAQMD Thresholds of Significance, be considered significant. The City defers to these thresholds for the evaluation of construction and operational air quality impacts.

[9] *South Coast Air Quality Management District, White Paper on Potential Control Strategies to Address Cumulative Impacts from Air Pollution, Appendix A, August 2003.*

Table IV-2
SCAQMD Thresholds of Significance

Pollutant	Construction Thresholds (lbs/day)	Operational Thresholds (lbs/day)
Volatile Organic Compounds (VOC)	75	55
Nitrogen Oxides (NO_x)	100	55
Carbon Monoxide (CO)	550	550
Sulfur Oxides (SO_x)	150	150
Particulate Matter (PM_{10})	150	150
Fine Particulate Matter ($PM_{2.5}$)	55	55

Note: lbs = pounds.
Source: SCAQMD CEQA Handbook (SCAQMD, 1993), SCAQMD Air Quality Significance Thresholds, website: http://aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf?sfvrsn=2; accessed: October 2019.

Regional Construction Emissions

For purposes of analyzing impacts associated with air quality, this analysis assumes a construction schedule of approximately 20 months, which is a conservative estimate and yields the maximum daily impacts. Shoring, excavation and site preparation would occur for approximately 2 months. Building construction would occur for approximately 18 months. This phase would include the construction of the proposed structures, connection of utilities, laying irrigation for landscaping, architectural coatings, and landscaping the Project Site.

These construction activities would temporarily create emissions of dusts, fumes, equipment exhaust, and other air contaminants. Construction activities involving grading and site preparation would primarily generate $PM_{2.5}$ and PM_{10} emissions. Mobile sources (such as diesel-fueled equipment onsite and traveling to and from the Project Site) would primarily generate NO_x emissions. The application of architectural coatings would primarily result in the release of ROG emissions. The amount of emissions generated on a daily basis would vary, depending on the amount and types of construction activities occurring at the same time. The analysis of daily construction emissions has been prepared utilizing the California Emissions Estimator Model (CalEEMod 2016.3.2) recommended by the SCAQMD to quantify the estimated daily emissions associated with Project construction. The results are presented in Table IV-3, Estimated Peak Daily Construction Emissions, which identifies daily emissions that are estimated to occur on peak construction days for each construction phase.

Table IV-3
Estimated Peak Daily Construction Emissions

Emissions Source	Emissions in Pounds per Day					
	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Shoring/Excavation/Site Preparation Phase						
Fugitive Dust	--	--	--	--	2.78	1.50
Off-Road Diesel Equipment	2.29	24.74	15.86	0.03	1.16	1.07
Worker Trips	0.07	0.05	0.55	0.01	0.17	0.05
Total Emissions	***2.36***	***24.79***	***16.41***	***0.04***	***4.11***	***2.62***
SCAQMD Thresholds	75.00	100.00	550.00	150.00	150.00	55.00
Significant Impact?	No	No	No	No	No	No
Building Construction Phase						
Building Construction Off-Road Diesel Equipment	1.90	17.43	16.58	0.03	0.96	0.90
Building Construction Vendor Trips	0.01	0.10	0.03	0.01	0.01	0.01
Building Construction Worker Trips	0.05	0.03	0.37	0.01	0.11	0.03
Paving Off-Road Diesel Equipment	1.10	11.12	14.58	0.02	0.57	0.52
Paving Worker Trips	0.07	0.04	0.51	0.01	0.17	0.05
Architectural Coatings	8.82	--	--	--	--	--
Architectural Coating Off-Road Diesel Equipment	0.20	1.41	1.81	0.01	0.08	0.08
Architectural Coatings Worker Trips	0.04	0.03	0.34	0.01	0.11	0.03
Total Emissions	***12.19***	***30.16***	***34.22***	***0.10***	***2.01***	***1.62***
SCAQMD Thresholds	75.00	100.00	550.00	150.00	150.00	55.00
Significant Impact?	No	No	No	No	No	No
Note: Calculations assume compliance with SCAQMD Rule 403 – Fugitive Dust. *Calculation sheets are provided in Appendix A.*						

These calculations assume compliance with SCAQMD Rule 1113 – Architectural Coatings and appropriate dust control measures would be implemented as part of the Project during each phase of development as required by SCAQMD Rule 403 – Fugitive Dust. Specific Rule 403 control requirements include, but are not limited to, applying water in sufficient quantities to prevent the generation of visible dust plumes (at least two times per day), applying soil binders to uncovered areas, reestablishing ground cover as quickly as possible, utilizing a wheel washing system to remove bulk material from tires and vehicle undercarriages before vehicles exit the Project Site, and maintaining effective cover over exposed areas. As shown in Table IV-3, construction-related daily emissions associated with the Project would not exceed any regional SCAQMD significance thresholds for criteria pollutants during the construction phases. Therefore, regional construction impacts are considered to be **less than significant**. Localized air quality emissions are addressed below.

Regional Operational Emissions

The Project would involve the construction of 6 residential units, totaling approximately 31,000 gross square feet, on the southern portion of the Project Site. Operational emissions generated by area sources, motor vehicles and energy demand would result from normal day-to-day activities of the Project. The analysis of daily operational emissions associated with the Project has been prepared utilizing CalEEMod 2016.3.2 recommended by the SCAQMD. The results of these calculations are presented in Table IV-4, Estimated Daily Operational Emissions. As shown, the operational emissions generated by the Project would not exceed the regional thresholds of significance set by the SCAQMD. Therefore, impacts associated with regional operational emissions from the Project would be less than significant. Localized air quality emissions are addressed below.

Table IV-4
Estimated Daily Operational Emissions

Emissions Source	Emissions in Pounds per Day					
	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Summertime (Smog Season) Emissions						
Area Sources	2.25	0.13	3.55	<0.01	0.46	0.46
Energy Demand	<0.01	0.04	0.02	<0.01	<0.01	<0.01
Mobile (Motor Vehicles)	0.11	0.51	1.46	<0.01	0.44	0.12
Total Project Emissions	**2.37**	**0.69**	**5.02**	**0.01**	**0.90**	**0.58**
SCAQMD Thresholds	55.00	55.00	550.00	150.00	150.00	55.00
Potentially Significant Impact?	No	No	No	No	No	No
Wintertime (Non-Smog Season) Emissions						
Area Sources	2.25	0.13	3.55	<0.01	0.46	0.46
Energy Demand	<0.01	0.04	0.02	<0.01	<0.01	<0.01
Mobile (Motor Vehicles)	0.10	0.53	1.38	<0.01	0.44	0.12
Total Project Emissions	**2.36**	**0.70**	**4.95**	**0.01**	**0.90**	**0.58**
SCAQMD Thresholds	55.00	55.00	550.00	150.00	150.00	55.00
Potentially Significant Impact?	No	No	No	No	No	No
Note: Column totals may not add due to rounding from the model results. Calculation sheets provided in Appendix A.						

As discussed above, the mass daily construction and operational emissions generated by the Project would not exceed any of the thresholds of significance recommended by the SCAQMD. In addition, as discussed under threshold question 3(a), the Project would not exceed SCAG projections for the City population and is therefore consistent with the AQMP. Also, as discussed below, localized emissions generated by the Project would not exceed the SCAQMD's Localized Significance Thresholds (LSTs). Therefore, the Project would not contribute a cumulatively considerable increase in emissions for the pollutants which the Basin is in nonattainment. Thus, cumulative air quality impacts associated with the Project would be **less than significant**.

c) Would the project expose sensitive receptors to substantial pollutant concentrations?

Less Than Significant Impact. A significant impact may occur if a project were to generate pollutant concentrations to a degree that would significantly affect sensitive receptors. Land uses that are considered more sensitive to changes in air quality than others are referred to as sensitive receptors. Land uses such as primary and secondary schools, hospitals, and convalescent homes are considered to be sensitive to poor air quality because the very young, the old, and the infirm are more susceptible to respiratory infections and other air quality-related health problems than the general public. Residential uses are considered sensitive because people in residential areas are often at home for extended periods of time, so they could be exposed to pollutants for extended periods. Recreational areas are considered moderately sensitive to poor air quality because vigorous exercise associated with recreation places a high demand on the human respiratory function. The nearest air quality sensitive receptors to the Project Site are:

- adjacent residences to the east;
- adjacent residences to the west;
- adjacent residences to the north; and
- residences to the south (125 feet).

Localized Emissions

Emissions from construction activities have the potential to generate localized emissions that may expose sensitive receptors to harmful pollutant concentrations. The SCAQMD has developed localized significance threshold (LST) look-up tables for project sites that are one, two, and five acres in size to simplify the evaluation of localized emissions at small sites. LSTs are provided for each Source Receptor Area (SRA) and various distances from the source of emissions.

In the case of this analysis, the Project Site is located within SRA 9 covering the East San Gabriel Valley area. The nearest sensitive receptors to the Project Site are residential uses within 25 meters. The closest receptor distance in the SCAQMD's mass rate look-up tables is 25 meters. Projects that are located closer than 25 meters to the nearest receptor are directed to use the LSTs for receptors located within 25 meters. Based on the Project's construction assumptions outlined previously, approximately 2.5 acres per day would be disturbed during the site preparation/grading/foundations phase. With respect to building construction, the 5.0-acre LST in SRA 9 with sensitive receptors located within 25 meters has conservatively been utilized to address the potential localized NO_x, CO, PM_{10}, and $PM_{2.5}$ impacts. The application of a 5.0-acre threshold for building construction activities on a 12.4-acre site would be conservative as physical building construction emissions would likely be spread out more evenly compared to the condensed 5-acre threshold applied in this analysis. The LSTs for a 2.5-acre site in SRA 9 with sensitive receptors located within 25 meters were calculated per SCAQMD Linear Regression Methodology (refer to Appendix A for more details).

As shown in Table IV-5, Localized On-Site Peak Daily Construction Emissions, peak daily emissions generated within the Project Site during construction activities for each phase would not exceed the applicable construction LSTs. Therefore, localized air quality impacts from Project construction activities on the off-site sensitive receptors would be **less than significant**.

Table IV-5
Localized On-Site Peak Daily Construction Emissions

Construction Phase [a]	Total On-site Emissions (Pounds per Day)			
	NO_x [b]	CO	PM_{10}	$PM_{2.5}$
Shoring/ Site Preparation Emissions	**24.74**	**15.86**	**3.94**	**2.56**
SCAQMD Localized Thresholds	*125.00*	*1,057.42*	*8.29*	*5.13*
Potentially Significant Impact?	No	No	No	No
Building Construction Emissions	**29.96**	**32.97**	**1.61**	**1.50**
SCAQMD Localized Thresholds	*203.00*	*1,733.00*	*14.00*	*8.00*
Potentially Significant Impact?	No	No	No	No

Note: Calculations assume compliance with SCAQMD Rule 403 – Fugitive Dust. Building construction emissions include architectural coatings.
[a] Based on the Project's construction assumptions outlined previously, the applicable LST for grading is 2.5 acres, and building construction is 5.0 acres. The localized thresholds for each phase are based on a receptor distance of 25 meters in SCAQMD's SRA 9. Where necessary, LST calculated per SCAQMD Linear Regression Methodology.
[b] The localized thresholds listed for NO_x in this table takes into consideration the gradual conversion of NO_x to NO_2, and are provided in the mass rate look-up tables in the "Final Localized Significance Threshold Methodology" document prepared by the SCAQMD. As discussed previously, the analysis of localized air quality impacts associated with NO_x emissions is focused on NO_2 levels as they are associated with adverse health effects.
Calculation sheets are provided in Appendix A.

With regard to localized emissions from motor vehicle travel, traffic congested roadways and intersections have the potential to generate localized high levels of carbon monoxide (CO). The SCAQMD suggests conducting a CO hotspots analysis for any intersection where a project would worsen the Level of Service (LOS) from A-C to any level below C, and for any intersection rated D or worse where the project would increase the V/C ratio by two percent or more. Based the Project's size, the Project does not meet the criteria for a full traffic study and would not have the potential to meet the SCAQMD criteria at any of the intersections in the Project vicinity. Thus, the Project would not have the potential to cause or contribute to an exceedance of the California one-hour or eight-hour CO standards of 20 or 9.0 ppm, respectively; or generate an incremental increase equal to or greater than 1.0 ppm for the California one-hour CO standard, or 0.45 ppm for the eight-hour CO standard at any local intersection. Therefore, impacts with respect to localized CO concentrations would be **less than significant**.

Toxic Air Contaminants (TAC)

As the Project consists of residential uses, the Project would not include any land uses that would involve the use, storage, or processing of carcinogenic or non-carcinogenic toxic air contaminants and no toxic airborne emissions would typically result from Project implementation. In addition, construction activities associated with the Project would be typical of other development projects in the area, and would be subject to the regulations and laws relating to toxic air pollutants at the regional, State, and federal level that would protect sensitive receptors from substantial concentrations of these emissions. In addition, construction activity would not result in long-term substantial sources of diesel particulate matter or other TAC emissions (i.e., 30 or 70 years) and would therefore not have the potential to generate significant health risks. Therefore, impacts associated with the release of toxic air contaminants would be **less than significant**.

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

Less Than Significant Impact. A project-related significant adverse effect could occur if construction or operation of the proposed Project would result in generation of odors that would be perceptible in adjacent sensitive areas. According to the SCAQMD *CEQA Air Quality Handbook*, 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. The Project involves the construction and operation of residential uses, which are not typically associated with odor complaints. Potential sources that may emit odors during construction activities include equipment exhaust. Odors from these sources would be localized and generally confined to the immediate area surrounding the Project. The Project would use typical construction techniques, and the odors would be typical of most construction sites and temporary in nature. As mentioned previously, the Project would be consistent with SCAQMD Rule 1113 – Architectural Coatings. As the Project involves no operational elements related to industrial projects, no long-term operational objectionable odors are anticipated. Therefore, potential impacts associated with objectionable odors would be **less than significant**.

4. BIOLOGICAL RESOURCES

The following analysis is based on the findings of:

- Biological Constraints Report for the Royal Oaks Project (APN: 8527-021-041), prepared by Dudek, March 20, 2015; (Biological Report)
- Royal Oaks Project (APN: 8527-021-041), Tree Preservation and Protection Plan, Dudek, October 2015. (Tree Plan)

Copies of these reports are available as Appendices B.1 and B.2.

a) Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulation, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Less than Significant Impact with Mitigation Incorporated.

Special-Status Plant Species

According to the Project's Biological Report, there is no U.S. Fish and Wildlife Service (USFWS)-designated critical habitat for listed plant species within the Project Site. Moreover, no federally or state listed plant species have the potential to occur within the Project Site. However, two special-status plant species were identified as having a moderate potential to occur within a portion of the Project Site containing chaparral and/or coast live oak woodland communities. The majority of this habitat occurs in the northern portion of the site, which is not proposed to be developed. However, isolated areas of coast live oak woodland and disturbed coast live oak woodland occur within the southern portion of the site, which is proposed for development. The two special-status plant species that were identified as having the potential to occur in the chaparral and/or coast live oak woodland communities are Plummer's mariposa lily (*Calochortus plummerae,* California Rare Plant Rank [CRPR] 1B.2) and Robinson's pepper-grass (*Lepidium virginicum* var. *robinsonii*, CRPR 1B.2). In the event that Plummer's mariposa lily and/or Robinson's pepper-grass were to be located on the site, the proposed Project may result in direct and/or indirect impacts to these special-status plant species, depending on where the plants are located within the site. The Project would implement Mitigation Measures **MM BIO-1** and **MM BIO-2** below to ensure that impacts remain below a level of significance. As such, with implementation of **MM BIO-1** and **MM BIO-2** impacts would be **less than significant**.

Mitigation Measures

MM BIO-1: <u>Focused Plant Survey.</u> Prior to the City taking action on the Project, a qualified botanist knowledgeable of the local flora must conduct focused special-status plant surveys consistent with California Native Plant Society protocols. Surveys must be conducted during the blooming season (May–July for Plummer's mariposa lily and January–July for Robinson's pepper-grass).

MM BIO-2: <u>Condition of Project Approval.</u> If special-status plants are observed during the focused surveys, measures must be developed and applied to the Project to reduce impacts below a level of significance, as necessary.

Special-Status Wildlife Species

According to the Project's Biological Report, there were no special-status wildlife species detected within the Project Site, and no USFWS-designated critical habitat for listed wildlife species exists within the Project Site. However, the site has the potential support eight special-status wildlife species, as these species have either been documented in the near vicinity of the site and/or suitable habitat exists on the site. These eight species are as follows: coast (Blainville's) horned lizard (*Phrynosoma blainvillei*, California Department of Fish and Wildlife [CDFW] Species of Species Concern [SSC]), coast range newt (*Taricha torosa*, SSC), Cooper's hawk (*Accipiter cooperii*, CDFW Watch List species [WL]), southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*, SSC), coastal California gnatcatcher (*Polioptila californica*, USFWS federally threatened [FT], SSC), western mastiff bat (*Eumops perotis californicus*, SSC), San Diego black-tailed jackrabbit (*Lepus californicus bennettii*, SSC), and big free-tailed bat (*Nyctinomops macrotis*, SSC). Additionally, pallid bat (*Antrozous pallidus*, SSC) has a potential to forage within the Project Site. In the event that these special-status wildlife species were to occur on the Project Site, the proposed Project may result in direct and/or indirect effects to these species. The Project would implement Mitigation Measures **MM BIO-3** and **MM BIO-4** below to ensure that impacts remain below a level of significance. As such, with implementation of **MM BIO-3** and **MM BIO-4** impacts would be **less than significant**.

Mitigation Measures

MM BIO-3: <u>Coastal California Gnatcatcher Treatment Plan:</u> Consultation with USFWS is recommended to determine whether protocol-level surveys for coastal California gnatcatcher would be required for the Project Site. If it is determined that coastal California gnatcatcher surveys are required, then surveys must be conducted in accordance with the currently accepted USFWS protocol (USFWS 1997). If protocol-level surveys are negative, no additional mitigation is required. If protocol-level surveys are positive, consultation with USFWS would be required and/or an incidental take permit (ITP) from the USFWS would be required, which would include appropriate mitigation.

MM BIO-4: <u>Condition of Project Approval.</u> Prior to construction, a presence/absence pre-construction survey must be conducted for special-status wildlife species. Additionally, any abandoned buildings within the Project Site must be examined for bat roosts and signs (i.e., guano). In the event that a sign is observed, a bat detection survey may be required to determine the species. If special-status wildlife species or bats are identified, avoidance and minimization measures must be developed and implemented prior to and during construction, as necessary.

b) Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

No Impact. According to the Project's Biological Report, the Project site does not support any sensitive vegetation communities and there are no documented streams or drainages leading into the Project Site. There are two natural drainages in the northern portion of the Project Site. The Project would not affect the upper portions of these drainages, since no development would occur within the northern portion of the Project Site. As such, **no impact** would occur.

c) Would the project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

No Impact. As described under item (b), the Project site does not support any sensitive vegetation communities and there are no documented streams or drainages leading into the Project Site. There are two natural drainages in the northern portion of the Project Site. The Project would not affect the upper portions of these drainages, since no development would occur within the northern portion of the Project Site. As such, **no impact** would occur.

d) Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Less than Significant Impact with Mitigation Incorporated. The Project Site provides suitable habitat for nesting birds. As such, nesting birds could be disturbed and affected during construction activities. Mitigation Measure **MM BIO-5** below would be implemented to ensure that impacts remain below a level of significance. As such, with implementation of **MM BIO-5** impacts would be **less than significant**.

Mitigation Measure

MM BIO-5: Condition of Project Approval. If ground disturbance and/or vegetation removal would occur during avian nesting season (February 1–August 31), the Project shall conduct preconstruction surveys to determine whether nesting birds are present. If they are present, the Project would develop and implement avoidance measures to protect nesting birds.

e) Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Less than Significant Impact with Mitigation Incorporated. There are numerous trees on the Project Site that are protected under Section 9.06.090 of the Municipal Code. The Project's Tree Plan identified potential direct and indirect impacts to trees and recommended mitigation measures. The Tree Report identified direct impacts to 70 coast live oaks and encroachment on an additional 20 oak trees (including 13 coast live oaks and 2 Engelmann oaks). In accordance with the recommendations of the Tree Plan, Mitigation Measure **MM BIO-6** would be implemented to ensure that impacts remain below a level of significance. As such, with implementation of **MM BIO-6** impacts would be **less than significant**.

Mitigation Measure

MM BIO-6: Condition of Project Approval. Replace the impacted trees with 393 trees with container oak plantings.

f) Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

No Impact. The City is not within a regional conservation plan, as designated by the CDFW.[10] Therefore, implementation of the proposed Project would not conflict with the provisions of an adopted habitat conservation plan; natural community conservation plan; or other approved local, regional, or state habitat plan, as none apply to the Project area. **No impact** would occur.

5. CULTURAL RESOURCES

a) Would the project cause a substantial adverse change in the significance of a historical resource pursuant to CEQA Guidelines Section 15064.5?

No Impact. The northern portion of the Project Site is largely undeveloped and would not be altered as a result of the Project. The southern portion of the Project Site, which the Project will be developed within, is currently vacant. As such, the Project would not cause a substantial adverse change to a historical resource. Therefore, **no impact** would occur.

b) Would the project cause a substantial adverse change in the significance of an archaeological resource as defined in Public Resources Code Section 21083.2 and 21084.1, and CEQA Guidelines Section 15064.5, respectively?

Less than Significant Impact with Mitigation Incorporated. As stated previously, the Project Site was recently developed with a single-family residence, appurtenant structures, and horse corrals. Additionally, the Project Site has previously served as an orchard. As such, any archaeological resources that may have existed near the site surface are likely to have been disturbed or previously removed. However, the Project would likely result in deeper excavations than previously performed on the site. As such, previously unknown archaeological resources may exist beneath the Project Site that could be uncovered during excavation activities. While the uncovering of archaeological resources is not anticipated, Mitigation Measure **MM CUL-1** below would ensure that any potential impact to a previously unknown archaeological resource is reduced to a less than significant level. Therefore, with **MM CUL-1**, the Project's impacts on archaeological resources would be **less than significant**.

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[10] *California Department of Fish and Wildlife, California Natural Community Conservation Plans, April 2019, website: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=68626&inline, accessed: October 2019.*

Mitigation Measure

MM CUL-1: If any archaeological materials are encountered during excavation, grading, or construction activities, work shall cease in the area of the find and a qualified archaeologist shall be secured by contacting the South Central Coastal Information Center located at California State University, Fullerton, or a member of the Society of Professional Archaeologists (SOPA) or a SOPA-qualified archaeologist, who shall determine the significance of the resource(s) as defined in Section 15064.5 of the State CEQA Guidelines. The archaeologist shall prepare a survey, study, or report evaluating the impact. Said survey, study, or report shall contain appropriate measure(s), as necessary, for the preservation, conservation, or relocation of the resource, and the Project Applicant shall comply with the measure(s).

c) Would the project disturb any human remains, including those interred outside of formal cemeteries?

Less than Significant Impact with Mitigation Incorporated. The Project Site is not known to be associated with any paleontological resources, including tribal cultural resources. However, the possibility of a paleontological discovery during the ground-disturbing activities associated with construction of the proposed Project cannot be discounted. In the event that a paleontological resource were to be discovered on the Project Site, the ground-disturbing activities associated with construction of the proposed Project would have the potential to destroy the resource, resulting in a potentially significant impact. As such, Mitigation Measure **MM CUL-2** below would ensure that any potential impact to a previously unknown paleontological resource is reduced to a less than significant level. Therefore, with **MM CUL-2**, the Project's impacts on archaeological resources would be **less than significant**.

Mitigation Measure

MM CUL-2: If human remains are encountered, California Health and Safety Code Section 7050.5 states that no further disturbance shall occur within 100 feet of the find until the Los Angeles County Coroner has made the necessary findings as to origin. Further, pursuant to California Public Resources Code Section 5097.98(b) remains shall be left in place and free from disturbance until a final decision as to the treatment and disposition has been made. If the Los Angeles County Coroner determines the remains to be Native American, the Native American Heritage Commission must be contacted within 24 hours. The Native American Heritage Commission must then immediately identify the "most likely descendants(s)" for purposes of receiving notification of discovery. The most likely descendant(s) shall then make recommendations within 48 hours, and engage in consultation concerning the treatment of the remains as provided in Public Resources Code Section 5097.98.

Mitigation Measure

MM CUL-1: If any archaeological materials are encountered during excavation, grading, or construction activities, work shall cease in the area of the find and a qualified archaeologist shall be secured by contacting the South Central Coastal Information Center located at California State University, Fullerton, or a member of the Society of Professional Archaeologists (SOPA) or a SOPA-qualified archaeologist, who shall determine the significance of the resource(s) as defined in Section 15064.5 of the State CEQA Guidelines. The archaeologist shall prepare a survey, study, or report evaluating the impact. Said survey, study, or report shall contain appropriate measure(s), as necessary, for the preservation, conservation, or relocation of the resource, and the Project Applicant shall comply with the measure(s).

6. ENERGY

a) Would the project result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy, or wasteful use of energy resources, during project construction or operation?

Less Than Significant Impact. The Project would result in increased use of energy (such as natural gas and electricity) during the construction phase. Energy usage would come from fuels to power construction vehicles and equipment and electricity with the use of equipment, lighting during construction, dust control, and during the production of materials such as asphalt, steel, concrete, pipes, and other materials. The energy use during construction would be temporary and cease once the Project has been completed.

Once in operation, the Project would result in increased use of energy for the operation of the residential uses. The construction and design of the Project would be required to comply with the 2019 California Energy Code Title 24 Part 6 for energy efficiency standards for nonresidential buildings, and with the 2016 California Green Building Standards (CALGreen) Code. Impacts would be **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. As noted above, the construction and operation of the Project would be required to comply with Title 24 of the California Code of Regulations. Compliance with this regulation would reduce any impact associated with an obstruction of a plan for renewable energy or energy efficiency. The impact would be **less than significant**.

7. GEOLOGY AND SOILS

The following analysis is based on the findings of:

- Report of Geotechnical Engineering Investigation, prepared by Quartech Consultants, April 22, 2014; (Geotechnical Investigation)
- Fault Investigation for the Property at 1901 Royal Oaks Drive, Bradbury, Los Angeles County, California, prepared by Earth Consultants International, Inc., October 6, 2015. (Fault Investigation)

Copies of these reports are available as Appendices C.1 and C.2.

a) Would the project directly or indirectly cause potential substantial adverse effects, including the risk of injury, damage 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?

Less Than Significant Impact. According to the Project's Fault Study the Project Site is located within an Alquist-Priolo fault zone. Specifically, the active Duarte Fault crosses north of the property. The Duarte Fault is considered a southern element of the Sierra Madre Fault Zone (SMFZ). To determine whether the faults associated with the Project Site would have the potential for future surface rupture, the Fault Investigation excavated, cleaned, logged and photographed two trenches with a combined total length of about 540 feet. The trenches were excavated in a southerly direction, roughly perpendicular to the easterly trend of the Duarte fault as mapped through this area. No breaks or disruptions in the lateral continuity of the sediments were observed in the trenches. Moreover, observations indicate that there are no active faults beneath the area evaluated in the Fault Investigation. As such, no measures designed to avoid or minimize potential effects related to surface fault rupture were recommended. Therefore, impacts would be **less than significant**.

(ii) Strong seismic ground shaking?

Less than Significant Impact with Mitigation Incorporated. The Project Site is located within the seismically active Southern California region and, like all locations within the region, is subject to strong seismic ground shaking. However, the proposed project would be designed and constructed in accordance with existing federal, state, and City engineering and design standards. While the number of occupants on the Project Site who may be exposed to ground shaking would increase upon implementation of the Project due to the increase of residential units, the risk of loss, injury, or death would not be adverse relative to other inhabited areas throughout Southern California. Additionally, the density on the Project Site would be consistent with that of surrounding areas. The design and construction of the Project would comply with all seismic-safety development requirements, including the Title 24 standards of the current California Building Code. Additionally, Mitigation Measure **MM GEO-1** below would ensure that the Project incorporates all recommendations and measures provided in the Geotechnical Investigation. As such, with implementation of **MM GEO-1** impacts would be **less than significant**.

Mitigation Measure

MM GEO-1: Prior to the issuance of permit(s) related to Project construction, the Project shall demonstrate the incorporation of the recommendations and measures provided in the Geotechnical Investigation prepared for the Project.

(iii) Seismic-related ground failure, including liquefaction?

Less than Significant Impact with Mitigation Incorporated. Liquefaction is the process in which saturated silty to cohesionless soils below the groundwater table temporarily lose strength during strong ground shaking as a consequence of increased pore pressure during conditions such as those caused by an earthquake. Earthquake waves cause water pressure to increase in the sediment and the sand grains to lose contact with each other, leading the sediment to lose strength and behave like a liquid. Areas susceptible to liquefaction have been identified to the north and northwest of the Project Site.[11] The Project would be designed and constructed in accordance with existing federal, state, and City engineering and design standards, including the Title 24 standards of the current California Building Code. While the number of occupants on the Project Site who may be exposed to seismic-related ground failure would increase upon implementation of the Project due to the increase of residential units, the risk of loss, injury, or death would not be adverse relative to other inhabited areas throughout Southern California. Additionally, **MM GEO-1** identified previously would ensure that the Project incorporates all recommendations and measures provided in the Geotechnical Investigation. As such, with implementation of **MM GEO-1** impacts would be **less than significant**.

[11] *California Geological Survey, Earthquake Zones of Required Investigation – Azusa Quadrangle, November 6, 2014, website: http://gmw.conservation.ca.gov/SHP/EZRIM/Maps/AZUSA_EZRIM.pdf, accessed: October 2019.*

(iv) Landslides?

Less than Significant Impact with Mitigation Incorporated. Earthquake-induced landslide zones have been mapped within, and adjacent to, the northern portion of the Project Site.[12] As such, landslides would have the potential to occur at the Project Site. However, the Geotechnical Investigation concluded that the existing slope is grossly stable. Additionally, **MM GEO-1** identified previously would ensure that the Project incorporates all recommendations and measures provided in the Geotechnical Investigation. As such, with implementation of **MM GEO-1** impacts would be **less than significant**.

b) Would the project result in substantial soil erosion or the loss of topsoil?

Less than Significant Impact with Mitigation Incorporated. The Project would involve grading activities within the southern portion of the Project Site to prepare the proposed lots for the development of residences. These grading activities would result in the loss of topsoil on the Project Site and may also cause erosion. However, there are a variety of state and federal regulations that guide the prevention of erosion and loss of topsoil during construction. The construction contractor would be required to comply with these regulations. This would include preparation of, and compliance with, a Storm Water Pollution Prevention Plan (SWPPP), which would include erosion control measures and best management practices (BMPs). Compliance with applicable regulations involving erosion control would reduce the effects of the proposed project relative to soil erosion and loss of topsoil. Additionally, **MM GEO-1** identified previously would ensure that the Project incorporates all recommendations and measures provided in the Geotechnical Investigation. As such, with implementation of **MM GEO-1** impacts would be **less than significant**.

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

Less than Significant Impact with Mitigation Incorporated. One of the major types of liquefaction-induced ground failure is lateral spreading of mildly sloping ground. Lateral spreading primarily involves side-to-side movement of earth materials due to ground shaking, and is evidenced by near-vertical cracks to predominantly horizontal movement of the soil mass involved. As discussed previously, the Project Site has not been identified as being at risk for liquefaction.

Subsidence is the lowering of surface elevation due to changes occurring underground, such as the extraction of large amounts of groundwater, oil, or gas. When groundwater is extracted from aquifers at a rate that exceeds the rate of replenishment, overdraft occurs, which can lead to subsidence. However, the Project does not include the extraction of any groundwater, oil, or gas from the Project area. Therefore, subsidence would not occur as a result of implementing the Project.

Collapsible soils consist of loose, dry materials that collapse and compact under the addition of water or excessive loading. Collapsible soils are prevalent throughout the southwestern United States, specifically in areas of young alluvial fans. Soil collapse occurs when the land surface is saturated at depths greater than those reached by typical rain events. The earth materials on the Project Site include fill and alluvial fan deposits. Additionally, **MM GEO-1** identified previously would ensure that the Project incorporates all

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[12] *Ibid.*

recommendations and measures provided in the Geotechnical Investigation. As such, with implementation of **MM GEO-1** impacts would be **less than significant**.

d) Would the project be located on expansive soil, as identified 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 with Mitigation Incorporated. Expansive soils are clay-based soils that tend to expand (increase in volume) as they absorb water, and shrink (lessen in volume) as water is drawn away. If soils consist of expansive clays, foundation movement and/or damage can occur if wetting and drying of the clay does not occur uniformly across the entire area. Portions of the Project area are underlain by alluvium consisting of brown silty sand, with some fine to coarse gravel. Moreover, the Geotechnical Investigation concluded that onsite soils have very low expansion potential. Proper site preparation, foundation design, and compliance with **MM GEO-1** would ensure that potential impacts related to expansive soils are at a level below significance. As such, with implementation of **MM GEO-1** impacts would be **less than significant**.

e) Would the project 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?

Less than Significant Impact with Mitigation Incorporated. The Project would implement 6 private septic tanks for the proposed 6 residential units. This would not be substantially different from the recently removed structures on the Project Site which utilized a septic and private sewage system. Moreover, the Geotechnical Report concluded the Project would be supported by the onsite soil. Additionally, the Project would implement **MM GEO-1** which would ensure that the Project incorporates all recommendations and measures provided in the Geotechnical Investigation. As such, with implementation of **MM GEO-1** impacts would be **less than significant**.

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. The Project Site is not known to be associated with any paleontological resources or unique geologic features. However, the possibility of a paleontological discovery during the ground-disturbing activities associated with construction of the proposed Project cannot be discounted. In the event that a paleontological resource were to be discovered on the Project Site, the ground-disturbing activities associated with construction of the proposed Project would have the potential to destroy the resource, resulting in a potentially significant impact. As such, Mitigation Measure **MM CUL-2** below would ensure that any potential impact to a previously unknown paleontological resource is reduced to a less than significant level. Therefore, with **MM CUL-2**, the Project's impacts on archaeological resources would be **less than significant**.

Mitigation Measure

MM CUL-1: If any archaeological materials are encountered during excavation, grading, or construction activities, work shall cease in the area of the find and a qualified archaeologist shall be secured by contacting the South Central Coastal Information Center located at California State University, Fullerton, or a member of the Society of Professional Archaeologists (SOPA) or a SOPA-qualified archaeologist, who shall determine the significance of the resource(s) as defined in Section 15064.5 of the State CEQA Guidelines. The archaeologist shall prepare a survey, study, or report evaluating the impact. Said survey, study, or report shall contain appropriate measure(s), as necessary, for the preservation, conservation, or relocation of the resource, and the Project Applicant shall comply with the measure(s).

Mitigation Measure

MM CUL-2: If human remains are encountered, California Health and Safety Code Section 7050.5 states that no further disturbance shall occur within 100 feet of the find until the Los Angeles County Coroner has made the necessary findings as to origin. Further, pursuant to California Public Resources Code Section 5097.98(b) remains shall be left in place and free from disturbance until a final decision as to the treatment and disposition has been made. If the Los Angeles County Coroner determines the remains to be Native American, the Native American Heritage Commission must be contacted within 24 hours. The Native American Heritage Commission must then immediately identify the "most likely descendants(s)" for purposes of receiving notification of discovery. The most likely descendant(s) shall then make recommendations within 48 hours, and engage in consultation concerning the treatment of the remains as provided in Public Resources Code Section 5097.98.

8. GREENHOUSE GAS EMISSIONS

a) Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Less Than Significant Impact. GHGs are gases that trap heat in the atmosphere. GHGs are emitted by both natural processes and human activities. The accumulation of GHGs in the atmosphere regulates the earth's temperature. The State has undertaken initiatives designed to address the effects of GHG emissions, and to establish targets and emission reduction strategies for GHG emissions. Activities associated with the Project, including construction and operational activities, have the potential to generate GHG emissions.

The principal GHGs are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), and water vapor (H_2O). CO_2 is the reference gas for climate change because it is the predominant GHG emitted. To account for the varying warming potential of different GHGs, GHG emissions are often quantified and reported as CO_2 equivalents (CO_2e).

California has enacted several pieces of legislation that relate to GHG emissions and climate change, much of which sets aggressive goals for GHG reductions within the State. As required by SB 97, the California Natural Resources Agency adopted amendments to the *State CEQA Guidelines* to address the specific obligations of public agencies when analyzing GHG emissions under CEQA to determine a project's effects on the environment. However, neither a threshold of significance nor any specific mitigation measures are included or provided in these *State CEQA Guidelines* amendments.

Regulatory Environment

State

Assembly Bill 32 and Senate Bill 32 (Statewide GHG Reductions)

The California Global Warming Solutions Act of 2006, widely known as Assembly Bill (AB) 32, requires the California Air Resources Board (CARB) to develop and enforce regulations for the reporting and verification of Statewide GHG emissions. CARB is directed to set a Statewide GHG emission limit, based on 1990 levels, to be achieved by 2020. The bill set a timeline for adopting a scoping plan for achieving GHG reductions in a technologically and economically feasible manner.

CARB's AB 32 Scoping Plan ("Scoping Plan") contains the main strategies to achieve the 2020 emissions cap. The Scoping Plan was developed by CARB with input from the Climate Action Team (CAT) and proposes a comprehensive set of actions designed to reduce overall carbon emissions in California, improve the environment, reduce oil dependency, diversify energy sources, and enhance public health while creating new jobs and improving the State economy. The GHG reduction strategies contained in the Scoping Plan include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms, such as a cap-and-trade system.

CARB has adopted the first update to the Scoping Plan.[13] This update identifies the next steps for California's leadership on climate change. The first update to the initial AB 32 Scoping Plan describes progress made to meet the near-term objectives of AB 32 and defines California's climate change priorities and activities for the next several years. It also frames activities and issues facing the State as it develops an integrated framework for achieving both air quality and climate goals in California beyond 2020.

In the original Scoping Plan, CARB approved a total Statewide GHG 1990 emissions level and 2020 emissions limit of 427 million metric tons of CO_2e. As part of the update, CARB revised the 2020 Statewide limit to 431 million metric tons of CO_2e, an approximately 1 percent increase from the original estimate. The 2020 business-as-usual forecast in the update is 509 million metric tons of CO_2e. The State would need to reduce those emissions by approximately 15 percent to meet the 431 million metric tons of CO_2e 2020 limit.

CARB also aims to reduce GHG emissions significantly by 2030. As California moves closer to reaching the 2020 GHG emission reduction goal state legislation has focused on furthering GHG emission reduction targets. Executive Order B-30-15 was issued April 2015 and establishes a mid-term GHG reduction target for California of 40 percent below 1990 levels by 2030. In 2016, the Legislature passed SB 37 with the companion bill AB 197 which further mandates the 2030 target and provides additional direction to CARB on strategies to reduce GHG emissions. In response to Executive Order B-30-15 and SB 37 CARB is moving forward with a second update to the Scoping Plan to reflect the 2030 target.[14]

SB 32 was enacted in 2016 and expands on AB 32 to require California to reduce greenhouse gas emissions to 40 percent below 1990 levels by 2030. The bill targets reductions from the leading greenhouse gas emitters in the state. Transportation is the largest sector of greenhouse gas emissions in the state and will be a primary subject for reductions. Through advances in technology and improved public transportation the state plans to significantly improve greenhouse gas emissions from transportation sources to meet the 2030 reduction goal.

California Senate Bills 1078, 107, 2, and 350 – Renewables Portfolio Standard

Established in 2002 under SB 1078 and accelerated in 2006 under SB 107, California's Renewables Portfolio Standard (RPS) requires retail suppliers of electric services to increase procurement from eligible

[13] *California Air Resources Board, First Update to the Climate Change Scoping Plan: Building on the Framework, May 2014.*

[14] *The Proposed Second Update to the Climate Change Scoping Plan was published January 20, 2017.*

renewable energy resources by at least 1 percent of their retail sales annually, until they reach 20 percent by 2010.

On April 2, 2011, Governor Jerry Brown signed SB 2 to increase California's RPS to 33 percent by 2020. This new standard also requires regulated sellers of electricity to procure 25 percent of their energy supply from certified renewable resources by 2016. Furthermore, Governor Brown signed SB 350 on October 7, 2015, which increases California's RPS to 50 percent by 2030.

Low Carbon Fuel Standard

California Executive Order S-01-07 (January 18, 2007) requires a 10 percent or greater reduction in the average carbon intensity for transportation fuels in California regulated by CARB. CARB identified the Low Carbon Fuel Standards (LCFS) as a Discrete Early Action item under AB 32, and the final resolution (09-31) was issued on April 23, 2009.

Sustainable Communities and Climate Protection Act (SB 375)

California's Sustainable Communities and Climate Protection Act, also referred to as SB 375, became effective January 1, 2009. The goal of SB 375 is to help achieve AB 32's GHG emissions reduction goals by aligning the planning processes for regional transportation, housing, and land use. SB 375 requires CARB to develop regional reduction targets for GHGs, and prompts the creation of regional plans to reduce emissions from vehicle use throughout the State. California's 18 Metropolitan Planning Organizations (MPOs) have been tasked with creating Sustainable Community Strategies in an effort to reduce the region's vehicle miles traveled (VMT) in order to help meet AB 32 targets through integrated transportation, land use, housing, and environmental planning. Pursuant to SB 375, CARB set per-capita GHG emissions reduction targets from passenger vehicles for each of the State's 18 MPOs. On September 23, 2010, CARB issued a regional 8 percent per capita reduction target for the planning year 2020, and a conditional target of 13 percent for 2035.

California Green Building Standards Code

Although not originally intended to reduce greenhouse gases, California Code of Regulations (CCR) Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings, was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption. Since then, Title 24 has been amended with recognition that energy-efficient buildings that require less electricity and reduce fuel consumption, which in turn decreases GHG emissions. The 2016 Title 24 standards (effective as of January 1, 2017) were revised and adopted in part to respond to the requirements of AB 32. Specifically, new development projects constructed within California after January 1, 2017 are subject to the mandatory planning and design, energy efficiency, water efficiency and conservation, material conservation and resources efficiency, and environmental quality measures of the CALGreen Code (California Code of Regulations, Title 24, Part 11).

Local Policies and Regulations

In 2017, the City adopted the CALGreen Code, thereby codifying provisions of CALGreen as the Green Building Code of the City of Bradbury. As stated in Chapter 17.09.010 of the Municipal Code, these regulations shall be known as the Green Building Code of the City of Bradbury and may be cited as such.

The City is addressing the issue of global climate change through implementation of its General Plan 2012-2030 Update (General Plan). Specifically, the Climate Action Plan Element of the General Plan compiles potential strategies (i.e., actions, projects, and programs) that the City's government operations and the community can use to address their impact on the environment. The Climate Action Plan does the following:

- Summarizes the various regulations at the federal, state, and regional levels.
- Incorporates the City's 2010 Greenhouse Gas Emission Inventory, which identified sources of greenhouse gas emissions generated by both the community and the City's government operations.
- Estimates how these emissions may change over time and establishes a target to reduce greenhouse gas emissions to 15% below 2008 levels by 2020.
- Provides national system, energy use, transportation, land use, green purchasing, waste and water use strategies necessary to minimize Bradbury's impacts on climate change and meet the established greenhouse gas emission reduction target.
- Creates a long-term vision for energy efficiency.
- Establishes reduction targets for energy efficiency.
- Identifies goals, policies, and actions to achieve energy reductions.
- Provides a framework implementing the identified goals, policies and actions.

Furthermore, at the regional level, SCAG's 2016-2040 RTP/SCS is a long-range plan that is intended to improve overall mobility, reduce GHGs, and enhance the quality of life for the region's residents. SB 375 requires the RTP/SCS to reduce GHG emissions from passenger vehicles by 8 percent per capita by 2020 and 13 percent per capita by 2035 compared to 2005 levels, as set by CARB. SB 375 enhances the State's goals of AB 32. In 2016 SCAG adopted the 2016-2040 RTP/SCS which requires further reductions in greenhouse gas emissions. Implementation of SCAG's 2016-2040 RTP/SCS is expected to exceed or meet the GHG emission-reduction targets set by CARB by achieving an 8 percent reduction by 2020, 18 percent reduction by 2035, and a 21 percent reduction by 2040 compared to the 2005 level on a per capita basis. This benefit is possible largely by more sustainable planning, integrating transportation and land use decisions to allow Southern Californians to live closer to where they work and play, and access to high-quality transit service. These means would significantly reduce VMTs.

GHG Significance Threshold

The L*.A. CEQA Thresholds Guide* does not provide any guidance as to how climate change issues are to be addressed in CEQA documents. Furthermore, neither SCAQMD nor the *State CEQA Guidelines* amendments provide any adopted thresholds of significance for addressing a non-industrial project's GHG emissions. Nonetheless, Section 15064.4 of the *State CEQA Guidelines* amendments serves to assist lead agencies in determining the significance of the impacts of GHGs. Because the City does not have an adopted quantitative threshold of significance for a project's generation of GHG emissions, the following analysis is based on a combination of the requirements outlined in the *State CEQA Guidelines* and a draft screening threshold previously considered by the SCAQMD.

As described in Section 15064.4(b) of the *State CEQA Guidelines*, this analysis includes an impact determination considering the following factors, among others:

> *(1) The extent to which the project may increase or reduce greenhouse gas 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;

(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. Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project's incremental contribution of greenhouse gas emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.

In December 2008, SCAQMD adopted an interim 10,000 metric tons CO_2e ($MTCO_2e$) per year screening level threshold for stationary source/industrial projects for which SCAQMD is the lead agency. SCAQMD continues to consider adoption of significance thresholds for non-industrial development projects. The most recent proposal issued in September 2010 uses the following tiered approach to evaluate potential GHG impacts from various uses:

Tier 1: Determine if CEQA categorical exemptions are applicable. If not, move to Tier 2.

Tier 2: Consider whether or not the proposed project is consistent with a locally adopted GHG reduction plan that has gone through public hearings and CEQA review that has an approved inventory, includes monitoring, etc. If not, move to Tier 3.

Tier 3: Consider whether the project generates GHG emissions in excess of screening thresholds for individual land uses. The 10,000 $MTCO_2e$/year threshold for industrial uses would be recommended for use by all lead agencies. Under option 1, separate screening thresholds are proposed for residential projects (3,500 $MTCO_2e$/year), commercial projects (1,400 $MTCO_2e$/year), and mixed-use projects (3,000 $MTCO_2e$/year). Under option 2 a single numerical screening threshold of 3,000 $MTCO_2e$/year would be used for all non-industrial projects. If the project generates emissions in excess of the applicable screening threshold, move to Tier 4.

Tier 4: Consider whether the project generates GHG emissions in excess of applicable performance standards for the project service population (population plus employment). The efficiency targets were established based on the goal of AB 32 to reduce Statewide GHG emissions to 1990 levels by 2020. The 2020 efficiency targets are 4.8 $MTCO_2e$ per service population for project level analyses and 6.6 $MTCO_2e$ per service population for plan level analyses. If the project generates emissions in excess of the applicable efficiency targets, move to Tier 5.

Tier 5: Consider the implementation of CEQA mitigation (including the purchase of GHG offsets) to reduce the project efficiency target to Tier 4 levels.

The thresholds identified above are not adopted by SCAQMD or distributed for widespread public review and comment, and the working group tasked with developing the thresholds has not met since September 2010. The future schedule and likelihood of threshold adoption is uncertain. However, for the purpose of evaluating the GHG impacts associated with the Project, this analysis utilizes the proposed 3,500 $MTCO_2e$ per year Tier 3 threshold for residential projects. These draft thresholds have been used for other projects in the Basin.

In addition, and separate from the above quantitative threshold, if the Project can demonstrate qualitative consistency with applicable plans, policies and regulations adopted for the purpose of reducing the emissions of GHGs, then impacts associated with GHG emissions would be less than significant.

Construction GHG Emissions

Construction emissions represent an episodic, temporary source of GHG emissions. Emissions are generally associated with the operation of construction equipment and the disposal of construction waste. To be consistent with the guidance from the SCAQMD for calculating criteria pollutants from construction activities, only GHG emissions from on-site construction activities and off-site hauling and construction worker commuting are considered as Project-generated. As explained by California Air Pollution Controls Officers Association (CAPCOA) in its 2008 white paper, the information needed to characterize GHG emissions from manufacture, transport, and end-of-life of construction materials would be speculative at the CEQA analysis level.[15] CEQA does not require an evaluation of speculative impacts (*CEQA Guidelines* §15145). Therefore, the construction analysis does not consider such GHG emissions, but does consider non-speculative on-site construction activities and off-site hauling and construction worker trips. All GHG emissions are identified on an annual basis.

Emissions of GHGs were calculated using CalEEMod 2016.3.2 for construction of the Project and the results of this analysis are presented in Table IV-6, Project Construction GHG Emissions. As shown in Table IV-6, total construction GHG emissions would be 574.33 metric tons. Consistent with SCAQMD recommendations and to ensure construction emissions are assessed in a quantitative sense, construction GHG emissions have been amortized over a 30-year period and have been added to the annual operational GHG emissions of the Project identified in Table IV-7.

Table IV-6
Project Construction GHG Emissions

Phase	CO_2e Emissions (Metric Tons per Phase)
2021	327.31
2022	247.02
Total Construction Emissions	**574.33**
GHG Emissions Amortized Over 30 Years	**19.14**
Note: Calculation data and results are provided in Appendix D.	

Operational GHG Emissions

Proposed Project

The Project would involve the construction of 6 residential units, totaling approximately 31,000 gross square feet, on the southern portion of the Project Site. The operations of the Project would generate GHG emissions from the usage of on-road motor vehicles, electricity, natural gas, water, and generation of solid waste and wastewater. Emissions of operational GHGs are shown in Table IV-7, Project

[15] *California Air Pollution Control Officers Association, CEQA & Climate Change, Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act, January 2008.*

Operational GHG Emissions. As shown, the GHG emissions generated by the Project would be approximately 134.57 CO_2e MTY.

Table IV-7
Project Operational GHG Emissions

Emissions Source	Estimated Project Generated CO_2e Emissions (Metric Tons per Year)
Area Sources	2.03
Energy Demand (Electricity & Natural Gas)	24.60
Mobile (Motor Vehicles)	82.25
Solid Waste Generation	3.51
Water Demand	3.04
Construction Emissions [a]	19.14
Project Total	**134.57**

[a] The total construction GHG emissions were amortized over 30 years and added to the operation of the Project.
Calculation sheets are provided in Appendix D.

As noted previously, the SCAQMD released a draft guidance document regarding interim CEQA GHG significance thresholds. The SCAQMD proposed a tiered approach, whereby the level of detail and refinement needed to determine significance increases with a project's total GHG emissions. The SCAQMD also proposed a screening level of 3,500 metric tons of CO_2e per year for residential projects, under which project impacts would be considered "less than significant." As shown in Table IV-7, the Project's GHG emissions would be under the 3,500 $MTCO_2e$ per year threshold for residential projects.

In addition, and separate from the quantitative analysis above, there is substantial evidence to support that the Project is qualitatively consistent with Statewide, regional, and local goals and policies in place for the reduction of GHG emissions, including AB 32 and the corresponding Scoping Plan. As discussed previously, the Project would be required to comply with the CALGreen Code and the Title 24 Standards adopted by the California Energy Commission. A new development project that can demonstrate compliance with the CALGreen Code is considered to be consistent with Statewide GHG-reduction goals and policies, including AB 32.

GHG Emissions Associated With Motor Vehicles

Motor vehicle-related GHG emissions are regulated at the federal, State and local levels. As discussed in the CARB Scoping Plan, the transportation sector – largely the cars and trucks that move goods and people – is the largest contributor with 38 percent of the State's total GHG emissions. Many of the transportation-related reduction measures identified in the Scoping Plan are focused on improving motor vehicle efficiencies through more restrictive Statewide laws and regulations. Some of these measures include Pavley I and II Standards for light-duty vehicles, LCFS, aerodynamic improvements for heavy-duty vehicles, and medium- and heavy-duty vehicle hybridizations. Together, these measures are estimated to reduce 2020 forecasted emissions by 52.60 million $MTCO_2e$. These regulatory measures are aimed at improving efficiencies of the motor vehicle fleet mix across the State and, as such, GHG emissions from future motor vehicles accessing the Project would be reduced as a result of these Statewide programs.

Conclusion

Through compliance with the CALGreen Code, the Project would be consistent with local and Statewide goals and policies aimed at reducing the generation of GHGs, including CARB's AB 32 Scoping Plan aimed at achieving 40 percent below 1990 levels by 2030. In addition, the Project's total construction and operational GHG emissions would not exceed the screening level of 3,500 metric tons of CO_2e per year for residential projects. Therefore, the Project's generation of GHG emissions would be **less than significant**.

b) Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Less Than Significant Impact. As described under threshold question 7(a), above, through required compliance with the CALGreen Code and the Green Building Code of the City of Bradbury, the Project would be consistent with local and Statewide goals and policies aimed at reducing the generation of GHGs, including CARB's AB 32 Scoping Plan aimed at achieving 40 percent below 1990 levels by 2030. Moreover, the Project would not conflict with goals and objectives of SCAG's adopted RTP/SCS, and the Project would be under SCAQMD's 3,500 metric tons of CO_2e per year threshold for residential projects. Therefore, a **less than significant** impact would occur.

9. HAZARDS AND HAZARDOUS MATERIALS

a) Would the project create a significant hazard to the public or the environment through the routine transport, use, emission or disposal of hazardous materials?

Less Than Significant Impact. Relatively small amounts of commonly used hazardous substances such as gasoline, diesel fuel, lubricating oil, adhesive materials, grease, solvents, and architectural coatings would be used during construction of the proposed Project. Storage, handling, and disposal of these materials would be required to comply with regulations set forth by State and federal agencies regarding hazardous materials, such as the Hazardous Materials Transportation Act, Resource Conservation and Recovery Act, the California Hazardous Material Management Act, and the California Code of Regulations, Title 22. Consequently, use of these materials for their intended purpose would not pose a significant risk to the public or environment. Once construction is complete, fuels and other petroleum products would no longer remain on-site.

Hazardous materials that could be used once the residences are constructed include chemical reagents, solvents, fuels, paints, cleansers, pesticides, fertilizers, pool chemicals, and miscellaneous organics and inorganics that are used as part of building and grounds maintenance, as well as vehicle maintenance by residents. Residents would be able to dispose of their hazardous wastes at Solvents/Automotive/Flammables/Electronics (S.A.F.E) Collection Centers, which are open every weekend. As such, implementation of the Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. Impacts are considered **less than significant**.

b) Would the project create 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. Project construction activities may involve the use of hazardous materials. These materials may include fuels, oils, mechanical fluids, and other chemicals used during construction. Storage, handling, and disposal of these materials would be required to comply with regulations set forth by State and federal agencies regarding hazardous materials, such as the Hazardous Materials Transportation Act, Resource Conservation and Recovery Act, the California Hazardous Material Management Act, and the California Code of Regulations, Title 22. Compliance would ensure that human health and the environment are not exposed to hazardous materials. In addition, the construction contractor would be required to implement a SWPPP during construction activities, which would prevent contaminated runoff from leaving the project site. Therefore, no significant impacts would occur during construction activities.

The Project would not be a large-quantity user of hazardous materials. Small quantities of hazardous materials would likely be used on-site, including cleaning solvents (i.e., degreasers, paint thinners, and aerosol propellants), paints (both latex- and oil-based), acids and bases (which are included in many cleaners), disinfectants, chlorine (pools, if any), pesticides, and fertilizers. The potential risks posed by the use and storage of these hazardous materials are primarily limited to the immediate vicinity of the materials. As discussed above, residents would be able to dispose of their hazardous wastes at S.A.F.E Collection Centers. Based on the small quantities of hazardous materials used by residential uses, as well as compliance with household hazardous waste disposal regulations, it is unlikely that implementation of the Project would release substantial amounts of hazardous materials into the environment that pose a threat to human health or the environment. As such, impacts are **less than significant**.

c) Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Less Than Significant Impact. Foothill Oaks Academy is located approximately 0.15 mile southeast of the Project Site. Project construction activities may involve the use of hazardous materials. These materials may include fuels, oils, mechanical fluids, and other chemicals used during construction. Storage, handling, and disposal of these materials would be required to comply with regulations set forth by State and federal agencies regarding hazardous materials, such as the Hazardous Materials Transportation Act, Resource Conservation and Recovery Act, the California Hazardous Material Management Act, and the California Code of Regulations, Title 22. Compliance with these statutes and regulations would ensure that children, teachers, staff, and visitors at the nearby schools are not exposed to hazardous materials.

The Project would operate as a typical residential development and would not be expected to introduce a substantial risk to human health through the release of hazardous materials. Potential hazardous materials would include household products and cleaning supplies as described previously. These substances would be stored in secure areas and would comply with all applicable storage, handling, usage, and disposal requirements. The potential risks posed by the use and storage of these hazardous materials are primarily limited to the immediate vicinity of the materials. As discussed above, residents are also able to dispose of their hazardous wastes at nearby S.A.F.E Collection Centers. As such, potential impacts are **less than significant**.

d) Would the project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Less Than Significant Impact. Because the Project Site has supported orchard and equestrian uses, there is the potential for contamination associated with pesticides or with chemicals used for animal husbandry. However, there are no known hazardous sites associated with the Project Site as according to California Department of Toxic Substances Control's (DTSC) EnviroStor database,[16] SWRCB's GeoTracker database,[17] and DTSC's current "Cortese" list.[18] Moreover, in the event that soil and/or groundwater contamination is detected on the Project Site, contaminated soils and/or groundwater would be required to be removed or remediated prior to construction of the Project. As such, impacts would be **less than significant**.

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

No Impact. The nearest airport to the Project Site is the San Gabriel Airport, located approximately 5.1 miles southwest from the Project Site. As such, the Project Site is not located within a two-mile radius of any public airport. The Project would not create an airport safety hazard for people residing or working in the project area, and **no impact** would occur.

f) Would the project Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Less Than Significant Impact. Royal Oaks Drive is identified as a Primary Evacuation Route by the City's Emergency Plan.[19] However, implementation of the Project would not result in direct impacts to this roadway. The construction of the Project does not include any activities that would interrupt the roadway's use as a Primary Evacuation Route. Additionally, the Los Angeles County Fire Department will review proposed emergency access for the Project Site prior to operation. Therefore, implementation of the Project would not result in an impact associated with an emergency evacuation plan. Impacts would be **less than significant**.

g) Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

Less Than Significant Impact. The Project involves the development of 6 residential units that would be constructed approximately 1.3 miles south of the Angeles National Forest. Additionally, the northern

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16 *California Department of Toxic Substances Control, EnviroStor, website: http://www.envirostor.dtsc.ca.gov/public/, accessed: October 2019.*

17 *State Water Resources Control Board, GeoTracker, website: http://geotracker.waterboards.ca.gov, accessed: October 2019.*

18 *California Department of Toxic Substances Control, Hazardous Waste and Substances Site List (Cortese), website: http://www.envirostor.dtsc.ca.gov/public/mandated_reports.asp, accessed: October 2019.*

19 *City of Bradbury, Emergency Plan, Evacuation Routes, June 2012, website: http://www.cityofbradbury.org/public-safety/emergency-preparedness/evacuation-routes, accessed: October 2019.*

portion of the Project Site would remain undeveloped under the proposed development. As such, wildland fire fuels would remain on the Project Site during Project operation. Moreover, the Project Site and surrounding areas are within a Fire Hazard Severity Zone.[20] For these reasons, the proposed residential structures and residents would be susceptible to risk associated with wildland fires. However, the Project would be located in an existing residential neighborhood, with other residences to the north, east, south, and west of the Project Site. The proposed development would be consistent with surrounding uses and would, therefore, not result in isolated residential uses. Furthermore, fire protection services would be available in the event of a wildland fire, and the Project would be designed and constructed in accordance with fire access requirements. Impacts would be **less than significant**.

10. HYDROLOGY AND WATER QUALITY

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. Because construction of the Project would require land disturbance of greater than one acre, the Project will be required to prepare and implement a SWPPP. A SWPPP requires the construction contractor to implement water quality BMPs to ensure that water quality standards are met, and that stormwater runoff from the construction work areas do not cause degradation of water quality in receiving water bodies (in this case the regional storm drain system). Some of these BMPs include appropriate handling and disposal of contaminants, fertilizer and pesticide application restrictions, litter control and pick up, and vehicle and equipment repair and maintenance in designated areas. The Applicant would also be required to comply with the requirements in Municipal Code Chapter 4 – Stormwater and Urban Runoff Pollution Control, which sets regulations to protect and enhance the quality of watercourses, water bodies, and wetlands within the City in a manner consistent with the Federal Clean Water Act, the California Porter-Cologne Water Quality Control Act and the municipal National Pollution Discharge Elimination System (NPDES) permit. Compliance with City and state requirements involving stormwater discharges during construction and operation would ensure that impacts are **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 Project would not deplete or substantially interfere with the local groundwater table because no groundwater wells are proposed. Moreover, the intensification of development on the Project Site would not interfere with groundwater recharge to the extent that there would be a net deficit in aquifer volume or a lowering of the groundwater table. Additionally, the increase in water use that would be caused by the increase in residences on the Project Site would not increase water use to the extent that groundwater supplies would become substantially depleted. For these reasons, impacts would be **less than significant**.

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[20] *County of Los Angeles, ArcGIS, Fire Hazard Severity Zones, February 2018, website: https://www.arcgis.com/home/webmap/viewer.html?useExisting=1&layers=307f567267aa4a2f8faeec493828539e, accessed: October 2019.*

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

(i) Result in substantial erosion or siltation on- or off-site?

Less Than Significant Impact. There are two natural drainages in the northern portion of the Project Site. The Project would not affect the upper portions of these drainages, since no development would occur within the northern portion of the Project Site. However, the development of the residences and a private street within the southern portion of the Project Site would alter the discharge of these drainages. The Project would include storm drains and stormwater infrastructure, which would direct stormwater flows into existing drainage facilities. As such, while the existing drainage pattern of the Project Site would be altered, stormwater would be directed and managed such that substantial erosion or siltation would not result. While the Project could result in erosion during site grading, the implementation of SWPPP, BMPs, NPDES requirements, and other erosion control measures would minimize substantial soil erosion or siltation on- or off-site. Impacts would be **less than significant**.

(ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

Less Than Significant Impact. As described above, the Project Site contains two existing natural drainages, which would remain mostly intact under the Project. Stormwater infrastructure would be developed in conjunction with the proposed residences and private street, such that flooding would not be increased on- or off-site. Impacts would be **less than significant**.

(iii) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

Less Than Significant Impact. The proposed drainage system on the Project Site would be required to conform to LACFCD requirements, thereby ensuring that stormwater flows from the Project Site do not exceed the capacity of LACFCD's stormwater drainage system.

Pollutants of concern for residential developments are usually associated with private vehicle maintenance (i.e., car washing and grease/oils associated with maintenance/repairs), yard work (i.e., improper/excessive use of pesticides, herbicides, and/or fertilizers), and/or trash (i.e., due to improper waste disposal). However, the addition of 6 single-family residences to the Project Site would not be anticipated to substantially increase the amount of runoff or polluted runoff from the Project Site. For these reasons, impacts would be **less than significant**.

(iv) Impeded or redirect flood flows?

No Impact. The Project Site is not located within a FEMA Flood Hazard Area.[21] Moreover, the Project Site is not located within a 100-year flood hazard area.[22] As such, **no impact** would occur.

d) For a project located within a flood hazard, tsunami, or seiche zone, would the project risk release of pollutants due to project inundation?

Less Than Significant Impact. The Project Site is not located within a 100-year flood hazard area.[23] The nearest dam to the Project Site is the Santa Anita Dam, located approximately 4.1 miles northwest from the Project Site.[24] Due to the distance between the Project Site and the Santa Anita Dam, it is not anticipated that the Project Site would be subject to flooding as a result of levee or dam failure. The Project is located approximately 28.7 miles from the nearest coastline. As such, the Project Site would not be at risk for tsunamis. Seiches are oscillations generated in enclosed bodies of water, usually as a result of earthquake-related ground shaking. A seiche wave has the potential to overflow the sides of a containing basin to inundate adjacent or downstream areas. There are no large enclosed bodies of water directly upstream from the Project Site. As such, the Project Site would not be subject to inundation by a seiche. Impacts would be **less than significant**.

e) Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Less Than Significant Impact. As stated previously, the Project will be required to prepare and implement a SWPPP. A SWPPP requires the construction contractor to implement water quality BMPs to ensure that water quality standards are met, and that stormwater runoff from the construction work areas do not cause degradation of water quality in receiving water bodies (in this case the regional storm drain system. The Applicant would also be required to comply with the requirements in Municipal Code Chapter 4 – Stormwater and Urban Runoff Pollution Control, which sets regulations to protect and enhance the quality of watercourses, water bodies, and wetlands within the City in a manner consistent with the Federal Clean Water Act, the California Porter-Cologne Water Quality Control Act and the municipal NPDES permit. The Project would not deplete or substantially interfere with the local groundwater table because no groundwater wells are proposed. Moreover, the intensification of development on the Project Site would not interfere with groundwater recharge to the extent that there would be a net deficit in aquifer volume or a lowering of the groundwater table. Additionally, the increase in water use that would be caused by the increase in residences on the Project Site would not increase water use to the extent that groundwater supplies would become substantially depleted. For these reasons impacts would be **less than significant**.

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[21] *Los Angeles County, Comprehensive Floodplain Management Plan, Appendix F: FEMA Flood Zone Maps, website: https://dpw.lacounty.gov/wmd/nfip/FMP/documents/CFMPDraftAppendixF.pdf, accessed: October 2019.*

[22] *California Department of Water Resources, Best Available Maps, website: http://gis.bam.water.ca.gov/bam/, accessed: October 2019.*

[23] *California Department of Water Resources, Best Available Maps, website: http://gis.bam.water.ca.gov/bam/, accessed: October 2019.*

[24] *County of Los Angeles Department of Public Works, Dam Locations, website: https://dpw.lacounty.gov/wrd/Reservoir/Reservoirs.pdf, accessed: October 2019.*

11. LAND USE AND PLANNING

a) Would the project physically divide an established community?

No Impact. The Project would involve the development of 6 residences within a property surrounded by residential neighborhoods. The Project would not involve features such as a highway, aboveground infrastructure, or an easement through an established neighborhood that would have the potential to divide an established community. The proposed residential development on the Project Site would be consistent with the surrounding land uses to the north, east, south and west. For these reasons, **no impact** would occur.

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

Less Than Significant Impact. The proposed Project is subject to the City's General Plan and the Zoning Ordinance. The Project would require reduced front yard and side yard setbacks relative to current zoning ordinance requirements and a street width with a minimum of 30 feet. However, implementation of the Project would involve approval of a specific plan for the Project Site, which would include site-specific setbacks and street width requirements. Upon approval of this specific plan, the Project would be consistent with the General Plan and Zoning Ordinance. Impacts would, therefore, be **less than significant**.

12. MINERAL RESOURCES

a) Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State?

No Impact. According to the California Department of Conservation, Division of Oil, Gas, and Geothermal Resources, there are no oil, gas, geothermal, or other known wells located within the Project Site.[25]

The Project Site is located within the San Gabriel Valley, which is an important source for portland cement concrete-grade aggregate. However, the Project Site has not been identified by the State Mining and Geology Board as being located in an area where significant portland cement concrete-grade aggregate resources are present.[26] Because the Project Site is not mapped as, or known to contain an important mineral resource, the proposed Project would not have the potential to cause a loss in availability of a known mineral resource that would be of value to the region and to the residents of the state. **No impact** would occur as a result of implementing the Project.

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25 *California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR), Well Finder, DOGGR GIS, website: https://maps.conservation.ca.gov/doggr/wellfinder/#/-117.96005/34.14361/16, accessed: October 2019.*

26 *California Department of Conservation, Natural Resources Agency, State Mining and Geology Board, Updated Designation of Regionally Significant Aggregate Resources In the San Gabriel Valley Production-Consumption Region, Los Angeles County, April 2014, website: https://www.conservation.ca.gov/smgb/reports/Documents/Designation_Reports/Designation-Report-12-San-Gabriel.pdf, accessed: October 2019.*

b) Would the project result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

No Impact. As discussed above, no active oil wells exist within the Project area, and the Project Site has not been mapped as an area where significant mineral deposits are present. The City consists of a low-density, rural residential community containing some agricultural land uses. In the event that a locally important mineral resource were to be located on the Project Site, the existing character of the City and the neighborhood would likely preclude development of mineral extraction activities on the Project Site. For these reasons, the Project would not result in the loss of availability of a locally important mineral resource recovery site, and **no impact** would result.

13. NOISE

a) Would the project generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Less than Significant Impact with Mitigation Incorporated.

Construction Noise

The Health and Safety Element of the General Plan establishes guidelines for controlling noise in the City. The objective of the Noise Chapter is to maintain and preserve the existing quiet and relative noise free environment in the City. The City also adopted a Noise Ordinance to establish acceptable noise levels generated on private property in residential neighborhoods. It is designed to control unnecessary, excessive and annoying sounds generated from stationary sources that may impact an adjacent property. Chapter 9.127 of the Municipal Code establishes controls regarding unnecessary, excessive and annoying noise. Specially, no person shall create or allow the creation of noise on any residential property which causes the noise level to exceed the actual measured median ambient noise level, or the presumed ambient noise level shown in Table IV-8 below, whichever is greater.

Table IV-8
City of Bradbury Allowable Ambient Noise Levels

Time	Allowable Noise Level (dBA)
7:00 A.M. to 10:00 P.M.	55
10:00 P.M. to 7:00 A.M.	50

The City's Noise Ordinance provides a means to enforce the existing quiet, noise free environment in the City. Specifically, per the Noise Ordinance the City will continue to:

- Incorporate measures into future residential projects which attenuate exterior noise levels in outdoor activity areas to a maximum of 65 CNEL and interior noise levels to a maximum CNEL of 45 dB.
- Establish through the design review process that schools are located and designed so that they comply with the acoustical criteria promulgated by the California Collaborative for High Performance Schools (CHPS).
- Enforce State vehicle noise regulations (Section 23130, 23130.5, 27150, 27151 and 38275 of the California Vehicle Code) to curtail the use of vehicles equipped with illegal or faulty exhaust

systems and "hot rods" exhibiting tire squeal or excessive exhaust noise.

- Enforce the California Noise Insulation Standards (Title 24 California Building Code) for dwellings to ensure an acceptable maximum interior noise level of 45 CNEL in habitable rooms, and maintain adequate noise insulation.
- Strictly enforce acoustical privacy, consistent with the California Noise Insulation Standards and all existing and future requirements outlined in the State Housing Code, for residential construction.
- Prohibit roosters and peacocks in the City.

As stated in Municipal Code Chapter 9.127, creating, maintaining, causing or allowing to be created, caused or maintained, any noise or vibration in a manner prohibited by or not in conformity with the provisions of this Chapter is declared to be a public nuisance and shall be punishable as such. However, per Section 9.127.080 of this Chapter certain activities are exempt from these policies, including construction or demolition work conducted between the hours of 7:00 A.M. and 7:00 P.M. on weekdays and the hours of 9:00 A.M. and 7:00 P.M. on weekends, excluding holidays.

Construction of the Project would require the use of heavy equipment for grading foundation preparation, the installation of utilities, and building construction. During each construction phase there would be a different mix of equipment operating and noise levels would vary based on the amount of equipment in operation and the location of each activity.

The U.S. Environmental Protection Agency (EPA) has compiled data regarding the noise generating characteristics of specific types of construction equipment and typical construction activities. The data pertaining to the types of construction equipment and activities that would occur at the Project Site are presented in Table IV-9, Noise Range of Typical Construction Equipment, and Table IV-10, Estimated Project Construction Noise Levels, respectively, at a distance of 50 feet from the noise source (i.e., reference distance).

The noise levels shown in Table IV-10 represent composite noise levels associated with the construction activities that will be carried out by the Project, which take into account both the number of pieces and spacing of heavy construction equipment that are typically used during each phase of construction in a development such as the Project. As shown in Table IV-10, construction noise during the heavier initial periods of construction is presented as 86 dBA Leq when measured at a reference distance of 50 feet from the center of construction activity. These noise levels would diminish rapidly with distance from the construction site at a rate of approximately 6 dBA per doubling of distance. For example, a noise level of 84 dBA Leq measured at 50 feet from the noise source to the receptor would reduce to 78 dBA Leq at 100 feet from the source to the receptor, and reduce by another 6 dBA Leq to 72 dBA Leq at 200 feet from the source to the receptor.

Table IV-9
Noise Range of Typical Construction Equipment

Construction Equipment	Noise Level in dBA L_{eq} at 50 Feet[a]
Front Loader	73-86
Trucks	82-95
Cranes (moveable)	75-88
Cranes (derrick)	86-89
Vibrator	68-82
Saws	72-82
Pneumatic Impact Equipment	83-88
Jackhammers	81-98
Pumps	68-72
Generators	71-83
Compressors	75-87
Concrete Mixers	75-88
Concrete Pumps	81-85
Back Hoe	73-95
Tractor	77-98
Scraper/Grader	80-93
Paver	85-88

[a] Machinery equipped with noise control devices or other noise-reducing design features does not generate the same level of noise emissions as that shown in this table.
Source: United States Environmental Protection Agency, Noise from Construction Equipment and Operations, Building Equipment and Home Appliances, PB 206717, 1971.

Table IV-10
Estimated Project Construction Noise Levels

Construction Phase	Noise Levels at 50 Feet with Mufflers (dBA L_{eq})	Noise Levels at 60 Feet with Mufflers (dBA L_{eq})	Noise Levels at 100 Feet with Mufflers (dBA L_{eq})	Noise Levels at 200 Feet with Mufflers (dBA L_{eq})
Ground Clearing	82	80	76	70
Excavation, Grading	86	84	80	74
Foundations	77	75	71	65
Structural	83	81	77	71
Finishing	86	84	80	74

Source: United States Environmental Protection Agency, Noise from Construction Equipment and Operations, Building Equipment and Home Appliances, PB 206717, 1971.

To identify the existing ambient noise levels in the general vicinity of the Project Site, noise measurements were taken with a Casella CEL-633 sound level meter, which conforms to industry standards set forth in ANSI S1.4-1983 (R2006) – Specification for Sound Level Meters/Type 1.[27] The measured noise levels are shown in Table IV-11, Existing Ambient Daytime Noise Levels. See Appendix E, for the location of the noise measurement and nearest sensitive receptors. The nearest noise sensitive receptors to the Project Site are:

- adjacent residences to the east;
- adjacent residences to the west;
- adjacent residences to the north; and
- residences to the south (125 feet).

Table IV-11
Existing Ambient Daytime Noise Levels

No.	Location	Primary Noise Sources	Noise Levels[a]		
			L_{eq}	L_{max}	L_{min}
1	Southeast corner of the Project Site, along Duarte Bike Trail.	Pedestrian activity along Duarte Bike Trail.	48.8	54.7	46.5
2	South of the Project Site, near residences along Royal Oaks Drive.	Traffic, pedestrian/residential, and parking activity along Royal Oaks Drive.	60.1	80.7	43.6
3	Northeast of the Project Site, near residences along Bradbury Hills Road.	Traffic and residential activity along Bradbury Hills Road.	44.4	58.3	38.9

[a] Noise measurements were taken on March, 18 2019 at each location for a duration of 15 minutes.
See Appendix E to this report for noise data.
Source: Pomeroy Environmental Services, 2019.

Due to the use of construction equipment during the construction phase, the Project would expose surrounding off-site receptors to increased ambient exterior noise levels comparable to those previously listed above in Table IV-10. Specifically, based on the data provided in Table IV-10, construction noise levels at the residences within 50 feet could reach 86 dBA compared to the existing measured noise levels for the area. It should be noted, however, that any increase in noise levels at off-site receptors during construction of the Project would be temporary in nature, and would not generate continuously high noise levels, although occasional single-event disturbances from construction are possible. In addition, the construction noise during the heavier initial periods of construction (i.e., foundation work) would typically be reduced in the later construction phases (i.e., interior building construction at the proposed buildings) as the physical structures would break the line-of-sight noise transmission from the construction area to the nearby sensitive receptors.

While the Project would generate noise impacts during construction, construction would occur in conformance with Section 9.127.080 of the Municipal Code which states construction or demolition work conducted between the hours of 7:00 A.M. and 7:00 P.M. on weekdays and the hours of 9:00 A.M. and 7:00 P.M. on weekends, excluding holidays is exempt from the City's noise provisions. Additionally, the

[27] *This noise meter meets the requirement specified in LAMC Section 111.01(l) that the instruments be "Type S2A" standard instruments or better. This instrument was calibrated and operated according to the manufacturer's written specifications. At the measurement sites, the microphone was placed at a height of approximately five feet above grade.*

Project would implement the Mitigation Measure **MM NOI-1** below for construction-related activities which would reduce impacts to **less than significant**:

Mitigation Measure

MM NOI-1: For all construction-related activities, noise attenuation techniques shall be employed, as appropriate, to reduce noise levels to the extent feasible during the construction phase. The following noise attenuation techniques shall be incorporated to reduce potential impacts of construction noise:

- Ensure that construction equipment is equipped with properly operating and maintained mufflers consistent with manufacturer's standards.
- Place noise-generating construction equipment and locate construction staging areas away from sensitive receptors, where feasible.
- Implement noise attenuation measures to the extent feasible, which may include, but are not limited to, temporary noise barriers or noise blankets around stationary construction noise sources.
- Use electric air compressors and similar power tools rather than diesel equipment, where feasible.
- All stationary construction equipment (e.g. air compressor, generators, impact wrenches, etc.) shall be operated as far away from residential uses as possible and shall be shielded with temporary sound barriers, sound aprons or sound skins.
- Construction-related equipment, including heavy-duty equipment, motor vehicles, and portable equipment, shall be turned off when not in use for more than 30 minutes.
- During all construction activities, the job superintendent shall limit all construction-related activities to between the hours 7:00 A.M. and 7:00 P.M. on weekdays and the hours of 9:00 A.M. and 7:00 P.M. on weekends (excluding holidays).
- Clearly post construction hours, allowable workdays, and the phone number of the job superintendent at all construction entrances to allow the surrounding property owners/occupants to contact the job superintendent. If the City or the job superintendent receives a complaint, the superintendent shall investigate, take appropriate corrective actions and report the actions to the complainant.

Operational Noise

As discussed previously, the City set forth noise standards for properties in the City occupied for residential purposes. Specifically, no person shall create or allow the creation of noise on any such residential property which causes the noise level to exceed the actual measured median ambient noise level, or the presumed ambient noise levels presented in Table IV-8, whichever is greater. The Project would be compatible with the existing surrounding land uses as it proposes single-family residences in an area already developed with single-family neighborhoods. Moreover, the Project does not propose any recreational uses that may significantly elevate indoor or outdoor noise levels. Though the Project would result in a minor increase in vehicle trips, it is not anticipated the result of these trips would increase noise levels to a level of significance. It is anticipated that operational noise would be similar to or equivalent to that of existing conditions.

In addition, on-site residences would not be adversely impacted by elevated ambient urban noise levels because the Project would be constructed to meet and exceed Title 24 insulation standards of the California Code of Regulations for residential buildings, which serves to provide an acceptable interior noise environment for sensitive uses. Specifically, as required by Title 24, the Project would be designed and constructed to ensure interior noise levels would be at or below a CNEL of 45 dBA in any habitable room of the project. Given the existing measured noise levels for the vicinity, and the approximate 30 dBA exterior-to-interior noise reduction for new residential construction,[28] it is clear that standard construction methods and materials would achieve interior noise levels at or below 45 dBA. As such, impacts associated with interior noise levels at the proposed residences would be **less than significant**.

b) Would the project generate excessive groundborne vibration or groundborne noise levels?

Less than Significant Impact with Mitigation Incorporated. Vibration is sound radiated through the ground. Vibration can result from a source (e.g., subway operations, vehicles, machinery equipment, etc.) causing the adjacent ground to move, thereby creating vibration waves that propagate through the soil to the foundations of nearby buildings. This effect is referred to as groundborne vibration. The peak particle velocity (PPV) or the root mean square (RMS) velocity is usually used to describe vibration levels. PPV is defined as the maximum instantaneous peak of the vibration level, while RMS is defined as the square root of the average of the squared amplitude of the level. PPV is typically used for evaluating potential building damage, while RMS velocity in decibels (VdB) is typically more suitable for evaluating human response.

The background vibration velocity level in residential areas is usually around 50 VdB. The vibration velocity level threshold of perception for humans is approximately 65 VdB. A vibration velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels for most people. Most perceptible indoor vibration is caused by sources within buildings such as operation of mechanical equipment, movement of people, or the slamming of doors. Typical outdoor sources of perceptible groundborne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the groundborne vibration from traffic is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings.

Construction Vibration

Construction activities for the Project have the potential to generate low levels of groundborne vibration. The operation of construction equipment generates vibrations that propagate through the ground and diminishes in intensity with distance from the source. Vibration impacts can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibration at moderate levels, to slight damage of buildings at the highest levels. The construction activities associated with the Project

[28] *Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings requires substantial building insulation and windows which reduces exterior to interior noise transmission.*

could have an adverse impact on both sensitive structures (i.e., building damage) and populations (i.e., annoyance).

In terms of construction-related impacts on buildings, the City has not adopted thresholds relative to groundborne vibration. As such, the Federal Transit Administration (FTA) and California Department of Transportation's (Caltrans) adopted vibration standards for buildings are used to evaluate potential impacts related to construction. Based on the FTA and Caltrans criteria, construction impacts relative to groundborne vibration would be considered significant if the following were to occur:[29]

- Project construction activities would cause a PPV groundborne vibration level to exceed 0.5 inches per second at any building that is constructed with reinforced-concrete, steel, or timber;
- Project construction activities would cause a PPV groundborne vibration level to exceed 0.3 inches per second at any engineered concrete and masonry buildings;
- Project construction activities would cause a PPV groundborne vibration level to exceed 0.2 inches per second at any non-engineered timber and masonry buildings; or
- Project construction activities would cause a PPV ground-borne vibration level to exceed 0.12 inches per second at any historical building or building that is extremely susceptible to vibration damage.

In addition, the City has not adopted any thresholds associated with human annoyance for groundborne vibration impacts. Therefore, this analysis uses the FTA's vibration impact thresholds for human annoyance. These thresholds include 80 VdB at residences and buildings where people normally sleep (e.g., nearby residences) and 83 VdB at institutional buildings, which includes schools and churches. No thresholds have been adopted or recommended for commercial and office uses. Table IV-12, Vibration Source Levels for Construction Equipment, identifies various PPV and RMS velocity (in VdB) levels for the types of construction equipment that would operate at the Project Site during construction.

Table IV-12

Vibration Source Levels for Construction Equipment

	Approximate PPV (in/sec)					Approximate RMS (VdB)				
Equipment	25 Feet	50 Feet	60 Feet	75 Feet	100 Feet	25 Feet	50 Feet	60 Feet	75 Feet	100 Feet
Large Bulldozer	0.089	0.031	0.024	0.017	0.011	87	78	76	73	69
Caisson Drilling	0.089	0.031	0.024	0.017	0.011	87	78	76	73	69
Loaded Trucks	0.076	0.027	0.020	0.015	0.010	86	77	75	72	68
Jackhammer	0.035	0.012	0.009	0.007	0.004	79	70	68	65	61
Small Bulldozer	0.003	0.001	0.0008	0.0006	0.0004	58	49	47	44	40

Note: in/sec = inches per second
Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment, Final Report, 2006.

[29] *Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2006; and California Department of Transportation, Transportation- and Construction –Induced Vibration Guidance Manual, June 2004.*

With respect to construction vibration impacts upon existing off-site structures, there are no known structures adjacent to the Project Site that would be considered structurally fragile or susceptible to vibration damages. However, there are residential uses immediately adjacent to the Project Site. According to the FTA,[30] ground vibration from construction activities do not often reach the levels that can damage structures. Nevertheless, a conservative quantified construction vibration assessment has been included in this analysis. Per the FTA (see above), there are four general building categories: I. Reinforced-concrete, steel or timber (no plaster), II. Engineered concrete and masonry (no plaster), III. Non-engineered timber and masonry buildings, and IV. Buildings extremely susceptible to vibration damage. Conservatively, this analysis assumes the adjacent uses best fit under Category III, Non-engineered timber and masonry building. The FTA identifies a 0.20 PPV (in/sec) construction vibration criteria for Category III. Based on the reference data provided in Table IV-12, worst-case construction vibration levels at adjacent locations could have the potential to exceed the FTA's 0.20 PPV (inches per second) construction vibration criteria for Category III. (Non-engineered timber and masonry building). However, the Project would comply with Section 9.127.080 of the Municipal Code which states construction or demolition work conducted between the hours of 7:00 A.M. and 7:00 P.M. on weekdays and the hours of 9:00 A.M. and 7:00 P.M. on weekends, excluding holidays is exempt from the City's noise provisions. Additionally, the Project would implement the Mitigation Measure **MM NOI-1** previously which would further reduce vibration impacts.

With respect to human annoyance resulting from vibration generated during construction, the sensitive receptors located in the vicinity of the Project Site could be exposed to increased vibration levels. Based on the data provided in Table IV-12, the adjacent residences could experience vibration levels of 87 VdB. As such, the 80 VdB residential annoyance threshold could be exceeded at these off-site locations during worst-case construction activity. However, it should be noted that vibration levels experienced in the Project vicinity would be temporary and intermittent, and would be reduced when the construction activities are located toward the center of the Project Site. As stated previously, the Project would comply with Section 9.127.080 of the Municipal Code which states construction or demolition work conducted between the hours of 7:00 A.M. and 7:00 P.M. on weekdays and the hours of 9:00 A.M. and 7:00 P.M. on weekends, excluding holidays is exempt from the City's noise provisions. Additionally, the Project would implement the Mitigation Measure **MM NOI-1** previously which would further reduce vibration impacts. As such, vibration impacts associated with construction of the Project would be **less than significant**.

Operational Vibration

The Project involves the construction and operation of residential uses and would not involve the use of stationary equipment that would result in high vibration levels, which are more typical for large manufacturing and industrial projects. Groundborne vibrations at the surrounding land uses currently result from heavy-duty vehicular travel (e.g., refuse trucks and transit buses) on the nearby local roadways, and the proposed land uses at the Project Site would not result in a substantive increase of these heavy-duty vehicles on the public roadways. While refuse trucks would be used for the removal of solid waste at the Project Site, these trips would typically only occur once a week and would not be any different than those presently occurring in the vicinity of the Project Site. As such, vibration impacts associated with operation of the Project would be **less than significant**.

[30] *FTA, Transit Noise and Vibration Impact Assessment, Final Report, 2006, see page 12-10.*

c) Would the project 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 two miles of a public airport or public use airport?

No Impact. The Project Site is not located in the vicinity of a private airstrip. The nearest airport to the Project Site is the San Gabriel Airport, located approximately 5.1 miles southwest from the Project Site. As such, the Project Site is not located within a two-mile radius of any public airport. **No impact** would occur.

14. POPULATION AND HOUSING

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

Less Than Significant Impact. The Project would involve the construction of 6 residential units, totaling approximately 31,000 gross square feet, on the southern portion of the Project Site. The Project's 6 residential units would result in a net increase of approximately 18 residents.[31] SCAG estimates the population of the City will increase from 1,100 in 2012 to 1,200 residents by 2040, a 9.1 percent increase.[32] As such, the Project's addition of 18 residents would not conflict with the residential growth projections for the City. As such, impacts would be **less than significant**.

b) Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

No Impact. The Project does not involve the demolition of any existing residential uses. As such, **no impact** would result.

15. PUBLIC SERVICES

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

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[31] *Based on recent estimates for average household size in the City of Bradbury (3.0 persons per household). Source: City-Data, Bradbury, California, website: http://www.city-data.com/city/Bradbury-California.html, accessed: October 2019.*

[32] *Southern California Association of Governments, 2016-2040 Regional Transportation Plan/Sustainable Communities Strategies, Demographics and Growth Forecast Appendix, Adopted April 2016, website: http://scagrtpscs.net/Documents/2016/final/f2016RTPSCS_DemographicsGrowthForecast.pdf, page 24 accessed: October 2019.*

a) Fire protection?

Less Than Significant Impact. The City contracts with the Los Angeles County Fire Department (LACFD) for fire protection services and to identify the fire protection needs and secure new sites for fire facilities. The City is served by Fire Station #44 and shares services with the City of Duarte. The fire station is located at 1105 Highland Avenue in Duarte, approximately 0.25 miles south of the Project Site.

The Project would be required to comply with Municipal Code Chapter 3 which adopted the 2015 Edition of the International Fire Code and Title 32 of the Los Angeles County Code, which constitutes an amended version of the 2016 California Fire Code. As stated in Section 4.03.010 of the Municipal Code adoption of these Fire Codes may be cited as the Fire Code of the City of West Hollywood. Additionally, the Project would be subject to Section 9.151.080 of the Municipal Code which sets requirements for water mains, appurtenances, and fire hydrants. The City involves the LACFD in the plan review process to confirm fire prevention and emergency response features are incorporated into development projects. Therefore, all site improvements proposed under the Project would be subject to review and approval by the LACFD prior to the issuance of a building permit and certificate of occupancy. Moreover, as described under Section IV-14. “Population and Housing,” the Project would not result in significant population growth that would induce unplanned population growth which could substantially alter service ratios, response times, or other performance objectives to the extent that new or expanded fire protection facilities, equipment, or staff would be required. Therefore, the Project would result in **less than significant** impacts associated with fire protection.

b) Police protection?

Less Than Significant Impact. The City of Bradbury contracts with the Los Angeles County Sheriff’s Department (LACSD) for law enforcement and crime prevention services. The City is served by the Temple Station, located at 8838 Las Tunas Drive in Temple City, approximately 6.7 miles southwest of the Project Site. This station is responsible for providing police services to the following cities and areas: Chantry Flats, Monrovia, Arcadia, Duarte, Bradbury, Rosemead, South El Monte, Temple City, North San Gabriel/East Pasadena, and South San Gabriel.[33] Development of the Project could result in a slight increase in calls for police protection service. However, as described under Section IV-14. “Population and Housing,” the Project would not result in significant population growth that would induce unplanned population growth which could substantially alter service ratios, response times, or other performance objectives to the extent that new or expanded police facilities, equipment, or staff would be required. The LACSD would be expected to provide adequate service to the Project area. Additionally, Project development would increase property tax revenues to provide a source of funding that is sufficient to offset any increase in anticipated demand for police protection services generated by the project. Impacts to police protection would be **less than significant**.

c) Schools?

Less Than Significant Impact. The Project Site is in the Duarte Unified School District (DUSD). Demand for public services such as schools is generally based on population. The Project involves the development of 6 residential units and has the potential for population growth. At this point, it is unknown whether any

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33 *Los Angeles County Sheriff’s Department, Temple Sheriff’s Station, website: https://lasd.org/temple/, accessed: October 2019.*

children will be added to the DUSD due to Project implementation. However, the potential number of children coming into the DUSD is low as the Project only proposes six residences.

Additionally, Assembly Bill 2926, passed in 1986, allows school districts to collect impact fees from developers of new residential and commercial/industrial building space. SB 50 and Proposition 1A, both of which passed in 1998, provided a comprehensive school facilities financing and reform program. The provisions of SB 50 prohibit local agencies from denying either legislative or adjudicative land use approvals on the basis that school facilities are inadequate, and reinstate the school facility cap for legislative actions. According to Government Code Section 65996, the payment of development fees authorized by SB 50 is deemed to be full and complete school facilities mitigation. The Project would be required to pay mandated residential development fees. As such, impacts to schools would be **less than significant**.

d) Parks?

Less Than Significant Impact. Due to the nature of the Project, new residents would be generated and would likely have the need for local parks and/or other public facilities. The Project would be adjacent to the Duarte Bike Trail which would be available to residents. Additionally, the City has parks to meet residential needs. The proposed lots would also be sufficient in size and residents may develop on-site recreational facilities for their own use. Given the small number of units associated with the Project, it would not result in the need for additional facilities. Impacts to parks would be **less than significant**.

e) Other public facilities?

Less Than Significant Impact. Other public facilities include libraries and City administrative services. The need for new or altered libraries or City administrative services is typically associated with an increase in population. As described under Section IV-14. "Population and Housing," the Project would not result in significant population growth that would induce unplanned population growth. It is therefore not anticipated that the development of these units would substantially alter the ability of libraries and parks to serve the region to the extent that new or expanded libraries and parks would be required. Impacts to libraries and parks would be **less than significant**.

16. RECREATION

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

Less Than Significant Impact. Increase in the use of parks is generally associated with an increase in residential population. As described under Section IV.14 "Population and Housing," the Project would not conflict with the residential growth projections for the City. The resulting minor increase in residential population is not anticipated to increase the use of existing parks to the extent that substantial physical deterioration of park facilities would occur or be accelerated. Moreover, the Project would be adjacent to the Duarte Bike Trail which would be available to residents. The proposed lots would also be sufficient in size and residents may develop on-site recreational facilities for their own use. Therefore, impacts would be **less than significant**.

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

No Impact. The Project does not include recreational facilities. As described under Section IV.14 “Population and Housing,” the Project would not conflict with the residential growth projections for the City. The resulting minor increase in residential population is not anticipated to require new or expanded recreational facilities. The recreation needs of the new households would be accommodated by existing facilities. As such, **no impact** would result and the construction or expansion of recreation facilities would not be required.

17. TRANSPORTATION

a) Would the project conflict with a plan, ordinance or policy addressing the circulation system, including transit, roadways, bicycle and pedestrian facilities?

Less Than Significant Impact. During Project construction, traffic would be generated in association with construction trucks and construction workers traveling to and from the Project Site. However, due to the small-scale development proposed (i.e., the construction of six residential units) and the associated limited duration of construction, it is not anticipated that construction would result in a significant increase in traffic to the extent that the performance of the circulation system in the City or in adjacent jurisdictions would be substantially affected. During operation, the Project would result in a net increase in daily trips due to the increase of residential units on the Project Site. However, the Project Site is located in an area of low-density residential development with minimal through traffic. As such, the minor incremental increase in traffic within the vicinity of the Project Site would not result in a significant increase in traffic to the extent that the performance of the circulation system in the City or in adjacent jurisdictions would be substantially affected. The Duarte Bike Trail is a pedestrian, bicycle, and equestrian trail adjacent to the wash that runs along the southern boundary of the Project Site. While visitors to this trail would be temporarily subject to an increase in noise and dust during construction, these effects would be limited to the duration of construction, and the performance and safety of the trail would not be compromised by construction activities at the proposed Project Site, as construction would not take place on the trail. During operation, the use of the trail may increase incrementally due to the introduction of the new residential units to the area immediately north of the facility. However, this increase would be negligible due to the minimal number of additional units, and the performance and safety of the facility would not be substantially affected. Because the Project Site is located within a rural residential area, no other designated transit, bicycle, or pedestrian facilities exist in the vicinity. For these reasons, impacts would be **less than significant**.

b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

Less Than Significant Impact. The applicable congestion management program (CMP) for the Project area and the metropolitan area that extends south of the City is the Los Angeles County Metropolitan Transportation Authority’s 2010 CMP. This program monitors and sets performance indicators for a transportation network of numerous highway segments, freeways, and key roadway intersections throughout Los Angeles County (called the CMP Highway and Roadway System).[34]

As discussed above, it is anticipated that traffic associated with the Project would be minor. The construction vehicles and vehicles associated with the residential development could use roadways and freeways that are part of the CMP Highway and Roadway System to access the Project Site from the surrounding Los Angeles metropolitan area. However, due to the minimal number of trips associated with the Project relative to existing traffic volumes throughout Los Angeles County and the Project area, the proposed Project would not result in substantial increases in traffic levels over existing conditions. As such, the Project would not conflict with existing level-of-service standards established in the CMP. Therefore, the impact to county congestion management agency roads and highways as a result of implementing the proposed project would be **less than significant**.

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

Less Than Significant Impact. The Project Site is currently accessed from the southwest corner of the property. At this corner, Royal Oaks Drive North, which is an east-west facility in the City, curves and extends southward for approximately 150 feet before intersecting with the east-west Royal Oaks Drive. This entrance to the Project Site would be maintained under the Project. During construction, construction vehicles may enter and exit the Project Site from this location. During operation, a minor increase in ingress/egress from this existing site entrance would also occur due to the increase in residential units on the Project Site. However, the entrance is visible to both eastbound traffic on Royal Oaks Drive North and to northbound traffic along the small segment of Royal Oaks Drive North that extends north-south. Furthermore, due to the minor nature of the increase in ingress/egress from the Project Site and the existing low traffic levels, any hazards associated with this curve would not substantially increase upon implementation of the Project. For these reasons, impacts would be **less than significant**.

d) Would the project result in inadequate emergency access?

Less Than Significant Impact. Royal Oaks Drive is identified as a Primary Evacuation Route by the City's Emergency Plan.[35] However, implementation of the Project would not result in direct impacts to this roadway. The construction of the Project does not include any activities that would interrupt the roadway's use as a Primary Evacuation Route. Additionally, the Los Angeles County Fire Department will review proposed emergency access for the Project Site prior to operation. Impacts would, therefore, be **less than significant**.

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[34] *Los Angeles County Metropolitan Transportation Authority, 2010 Congestion Management Program, website: http://media.metro.net/projects_studies/cmp/images/CMP_Final_2010.pdf, accessed: October 2019.*

[35] *City of Bradbury, Emergency Plan, Evacuation Routes, June 2012, website: http://www.cityofbradbury.org/public-safety/emergency-preparedness/evacuation-routes, accessed: October 2019.*

18. TRIBAL CULTURAL RESOURCES

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

(a) 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)?

(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) to Public Resources Code Section 5024.1? In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?

Less than Significant Impact with Mitigation Incorporated. Per required regulation under AB 52, and prior to Project approval, the Project will submit a written request to the State of California Native American Heritage Commission (NAHC) for a records search in the commission's Sacred Lands File to determine if any Tribal Cultural Resources are associated with the Project Site. Moreover, as discussed previously under threshold question 5(c), the Project Site is not known to be associated with any paleontological resources, including tribal cultural resources. However, the possibility of a paleontological discovery during the ground-disturbing activities associated with construction of the proposed Project cannot be discounted. In the event that a paleontological resource were to be discovered on the Project Site, the ground-disturbing activities associated with construction of the proposed Project would have the potential to destroy the resource, resulting in a potentially significant impact. As such, Mitigation Measure **MM CUL-2** below would ensure that any potential impact to a previously unknown paleontological resource is reduced to a less than significant level. Therefore, with **MM CUL-2**, the Project's impacts on archaeological resources would be **less than significant**.

Mitigation Measure

MM CUL-2: If human remains are encountered, California Health and Safety Code Section 7050.5 states that no further disturbance shall occur within 100 feet of the find until the Los Angeles County Coroner has made the necessary findings as to origin. Further, pursuant to California Public Resources Code Section 5097.98(b) remains shall be left in place and free from disturbance until a final decision as to the treatment and disposition has been made. If the Los Angeles County Coroner determines the remains to be Native American, the Native American Heritage Commission must be contacted within 24 hours. The Native American Heritage Commission must then immediately identify the "most likely descendants(s)" for purposes of receiving notification of discovery. The most likely descendant(s) shall then make recommendations within 48 hours, and engage in consultation concerning the treatment of the remains as provided in Public Resources Code Section 5097.98.

19. UTILITIES AND SERVICE SYSTEMS

a) Would the project require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunication facilities, the construction or relocation of which could cause significant environmental effects?

Less Than Significant Impact.

Water

The Project would increase the amount of water usage at the Project Site by including 6 residential units. The Project Site is served by California American Water, which currently provides service for over 675,000 people.[36] As such, the addition of 6 residential units would not be a significant increase to the existing service population under California American Water. The Project would not require or result in the construction or expansion of water supply facilities. As such, impacts would be **less than significant**.

Wastewater

The Project would include 6 private septic tanks and a private sewage system. This would be similar to the previous developed uses on the Project Site which utilized a similar system. As such, the Project would not require the construction or expansion of wastewater treatment facilities. Impacts would be **less than significant**.

Stormwater

The proposed drainage system on the Project Site would be required to conform to LACFCD requirements, thereby ensuring that stormwater flows from the Project Site do not exceed the capacity of LACFCD's stormwater drainage system. As such, the Project would not require or result in the construction or expansion of any off-site stormwater drainage facilities. Therefore, impacts related to stormwater drainage facilities would be **less than significant**.

Electric Power, Natural Gas, and Telecommunications

The Project Site is located in an area of the City that is served by existing electric power, natural gas and telecommunications services. The Project involves the construction of 6 residential units which would not be a significant increase to the Project area. New connections would be established for the Project; however, no substantial electrical, gas, or telecommunications infrastructure is present on or adjacent to the Project Site that would need to be relocated to accommodate the Project. Impacts would be **less than significant**.

b) Would the project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?

Less Than Significant Impact. The Project would increase the amount of water usage at the Project Site by including 6 residential units. The Project Site is served by California American Water, which currently

[36] *California American Water, About Us, website: https://amwater.com/caaw/about-us, accessed: October 2019.*

provides service for over 675,000 people.[37] As such, the addition of 6 residential units would not be a significant increase to the existing service population under California American Water. The Project does not include activities that could obstruct the future water projects. As such, impacts would be **less than significant**.

c) Would the project result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

Less Than Significant Impact. The Project would include 6 private septic tanks and a private sewage system. This would be similar to the previous developed uses on the Project Site which utilized a similar system. As such, the Project would not impact wastewater treatment services. Impacts would be **less than significant**.

d) Would the project generate solid waste in excess of State or local standards or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

Less Than Significant Impact. The Project would generate construction waste during Project development. Project operation would result in residential waste associated with large-lot residential uses. Given that the Project only includes 6 residential uses, the Project it would not generate a substantial amount of soil waste. The Project is estimated to have a waste volume of 73.4 pounds (0.04 tons) per day.[38] Solid waste service in Bradbury is provided by Burrtec, which uses the Salton City Landfill for refuse disposal. As of November 14, 2013 (the most up-to-date information), the landfill has an estimated closure date of 2038.[39] The facility has a daily maximum capacity of 6,000 tons per day and a design maximum capacity of 65,100,000 cubic. yards.[40] Sufficient capacity remains to serve the Project. As such the Project's generation of 0.04 tons of solid waste per day would not exceed capacity of the Salton City Landfill. Therefore, impacts would be **less than significant**.

e) Would the project comply with federal, state and local management and reduction statutes and regulations related to solid waste?

Less Than Significant Impact. The Project would comply with federal, State, and local regulations regarding solid waste. These regulations include:

- California Integrated Waste Management Act of 1989 (Assembly Bill [AB] 939). AB 939 requires cities and counties to reduce the amount of solid waste entering existing landfills through recycling, reuse, and waste prevention efforts. These efforts have included permitting procedures for waste haulers and handlers.

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37 *Ibid.*

38 *L.A. CEQA Thresholds Guide, 2006, page M.3-2. (12.23 lbs./residential unit per day).*

39 *CalRecycle, SWIS Facility Detail, Salton City Solid Waste Site (13-AA-0011), website: https://www2.calrecycle.ca.gov/SWFacilities/Directory/13-AA-0011/Detail/, accessed: October 2019.*

40 *Ibid.*

- California Solid Waste Reuse and Recycling Access Act of 1991 (AB 1327), which requires local jurisdictions to adopt an ordinance requiring commercial buildings to provide an adequate storage area for the collection and removal of recyclable materials. The City of Los Angeles passed such an ordinance in 1997.

- AB 341 of 2012 requires businesses to arrange for recycling services.

- Municipal Code Title XI – Health and Sanitation, Chapter 1 – Solid Waste and Recyclable Material Collection.

As such impacts would be **less than significant**.

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?

Less Than Significant Impact. Royal Oaks Drive is identified as a Primary Evacuation Route by the City's Emergency Plan.[41] However, implementation of the Project would not result in direct impacts to this roadway. The construction of the Project does not include any activities that would interrupt the roadway's use as a Primary Evacuation Route. Additionally, the Los Angeles County Fire Department will review proposed emergency access for the Project Site prior to operation. Therefore, implementation of the Project would not result in an impact associated with an emergency evacuation plan. Impacts would be **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 uncontrolled spread of wildfire?

Less Than Significant Impact. The Project involves the development of 6 residential units that would be constructed approximately 1.3 miles south of the Angeles National Forest. Additionally, the northern portion of the Project Site would remain undeveloped under the proposed development. As such, wildland fire fuels would remain on the Project Site during Project operation. Moreover, the Project Site and surrounding areas are within a Fire Hazard Severity Zone.[42] For these reasons, the proposed residential structures and residents would be susceptible to risk associated with wildland fires. However, the Project would be located in an existing residential neighborhood, with other residences to the north, east, south, and west of the Project Site. The proposed development would be consistent with surrounding uses and would, therefore, not result in isolated residential uses. Additionally, the Los

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[41] *City of Bradbury, Emergency Plan, Evacuation Routes, June 2012, website: http://www.cityofbradbury.org/public-safety/emergency-preparedness/evacuation-routes, accessed: October 2019.*

[42] *County of Los Angeles, ArcGIS, Fire Hazard Severity Zones, February 2018, website: https://www.arcgis.com/home/webmap/viewer.html?useExisting=1&layers=307f567267aa4a2f8faeec493828539e, accessed: October 2019.*

Angeles County Fire Department will review proposed emergency access for the Project Site prior to operation. Furthermore, fire protection services would be available in the event of a wildland fire, and the Project would be designed and constructed in accordance with fire access requirements. Impacts would be **less than significant**.

c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water resources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment.

Less Than Significant Impact. The Project involves the development of 6 residential units that would be constructed approximately 1.3 miles south of the Angeles National Forest. As part of the Project, Royal Oaks Drive would be extended to allow access to the proposed residences. The northern portion of the Project Site would remain undeveloped under the proposed development. As such, wildland fire fuels would remain on the Project Site during Project operation. Moreover, the Project Site and surrounding areas are within a Fire Hazard Severity Zone.[43] However, the Project would be located in an existing residential neighborhood, with other residences to the north, east, south, and west of the Project Site. The proposed development would be consistent with surrounding uses and would, therefore, not result in isolated residential uses which would require the installation or maintenance of additional infrastructure which may exacerbate fire risk. Impacts would be **less than significant**.

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.

Less Than Significant Impact. Earthquake-induced landslide zones have been mapped within, and adjacent to, the northern portion of the Project Site.[44] As such, landslides would have the potential to occur at the Project Site. However, the Geotechnical Investigation concluded that the existing slope is grossly stable. Additionally, there are two natural drainages in the northern portion of the Project Site. The Project would not affect the upper portions of these drainages, since no development would occur within the northern portion of the Project Site. However, the development of the residences and a private street within the southern portion of the Project Site would alter the discharge of these drainages. The Project would include storm drains and stormwater infrastructure, which would direct stormwater flows into existing drainage facilities. As such, while the existing drainage pattern of the Project Site would be altered, stormwater would be directed and managed such that substantial erosion or siltation would not result. Impacts would be **less than significant**.

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,

[43] *County of Los Angeles, ArcGIS, Fire Hazard Severity Zones, February 2018, website: https://www.arcgis.com/home/webmap/viewer.html?useExisting=1&layers=307f567267aa4a2f8faeec493828539e, accessed: October 2019.*

[44] *Ibid.*

substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Less than Significant Impact with Mitigation Incorporated. As discussed under the "Biological Resources" section, the Project has the potential to affect biological resources that may occur on the Project Site. While some sensitive biological resources may be present on the Project Site, the site is limited in size, is partially developed and disturbed, and is surrounded on all sides by residential development. For these reasons, increasing the intensity of development within the southern portion of the Project Site would not substantially reduce habitat, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or reduce the number or restrict the range of a rare or endangered plant or animal. Moreover, the Project would implement Mitigation Measures **MM BIO-1** through **MM BIO-6** which would ensure impacts to biological resources are **less than significant**.

As discussed under the "Cultural Resources" section, the Project Site was recently developed with a single-family residence, appurtenant structures, and horse corrals. Additionally, the Project Site has previously served as an orchard. As such, any archaeological resources that may have existed near the site surface are likely to have been disturbed or previously removed. However, the Project would likely result in deeper excavations than previously performed on the site. As such, previously unknown archaeological resources may exist beneath the Project Site that could be uncovered during excavation activities. Moreover, the Project Site is not known to be associated with any paleontological resources, including tribal cultural resources. However, the possibility of a paleontological discovery during the ground-disturbing activities associated with construction of the proposed Project cannot be discounted. In the event that a paleontological resource were to be discovered on the Project Site, the ground-disturbing activities associated with construction of the proposed Project would have the potential to destroy the resource, resulting in a potentially significant impact. As such, the Project would implement Mitigation Measures **MM CUL-1** and **MM CUL-2** which would ensure impacts to cultural and tribal resources are **less than significant**.

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. The following project has been identified to be located near the Project area and that could occur within the same timeframe as the Project:

- Oak View Estates Specific Plan Project (SCH 2018021067);

The Project will coordinate with the City to ensure that potential impacts would not be cumulatively considerable such as compliance and coordination to ensure traffic control plans for multiple projects are consistent with each other. Impacts would be **less than significant**.

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

Less than Significant Impact with Mitigation Incorporated. The Project could have the potential to impact humans during construction of the residential uses with regard to potential exposure to emissions, hazardous materials, noise, and traffic. However, with the implementation of project BMPs, substantial adverse impacts would be minimized during construction and operation of the Project. The implementation of Mitigation Measure **MM NOI-1** would reduce impacts to a **less than significant** level.

Appendix A

Air Quality Data

1901 Royal Oaks

Los Angeles-South Coast County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	6.00	Dwelling Unit	6.07	31,000.00	17

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2022
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Project description.

Construction Phase - Estimated schedule.

Grading - No soil import/export.

Trips and VMT - Added worker trips.

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	20.00	22.00
tblConstructionPhase	NumDays	230.00	396.00
tblConstructionPhase	NumDays	20.00	44.00
tblConstructionPhase	NumDays	20.00	22.00
tblConstructionPhase	PhaseEndDate	3/24/2022	9/8/2022
tblConstructionPhase	PhaseEndDate	1/27/2022	9/8/2022
tblConstructionPhase	PhaseEndDate	3/11/2021	3/3/2021
tblConstructionPhase	PhaseEndDate	2/24/2022	8/9/2022
tblConstructionPhase	PhaseStartDate	2/25/2022	8/10/2022
tblConstructionPhase	PhaseStartDate	3/12/2021	3/4/2021
tblConstructionPhase	PhaseStartDate	2/12/2021	1/1/2021
tblConstructionPhase	PhaseStartDate	1/28/2022	7/11/2022
tblGrading	AcresOfGrading	22.00	6.07
tblLandUse	LandUseSquareFeet	10,800.00	31,000.00
tblLandUse	LotAcreage	1.95	6.07
tblTripsAndVMT	WorkerTripNumber	2.00	10.00
tblTripsAndVMT	WorkerTripNumber	0.00	10.00

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	2.3619	24.7856	16.9715	0.0313	6.3361	1.1613	7.4973	3.3705	1.0684	4.4389	0.0000	3,032.7662	3,032.7662	0.9336	0.0000	3,056.1055
2022	10.8204	26.9062	31.8184	0.0526	0.2858	1.3793	1.6651	0.0760	1.2858	1.3618	0.0000	5,047.1333	5,047.1333	1.3347	0.0000	5,080.5016
Maximum	**10.8204**	**26.9062**	**31.8184**	**0.0526**	**6.3361**	**1.3793**	**7.4973**	**3.3705**	**1.2858**	**4.4389**	**0.0000**	**5,047.1333**	**5,047.1333**	**1.3347**	**0.0000**	**5,080.5016**

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	2.3619	24.7856	16.9715	0.0313	2.9434	1.1613	4.1047	1.5412	1.0684	2.6095	0.0000	3,032.7662	3,032.7662	0.9336	0.0000	3,056.1055
2022	10.8204	26.9062	31.8184	0.0526	0.2858	1.3793	1.6651	0.0760	1.2858	1.3618	0.0000	5,047.1333	5,047.1333	1.3347	0.0000	5,080.5016
Maximum	**10.8204**	**26.9062**	**31.8184**	**0.0526**	**2.9434**	**1.3793**	**4.1047**	**1.5412**	**1.2858**	**2.6095**	**0.0000**	**5,047.1333**	**5,047.1333**	**1.3347**	**0.0000**	**5,080.5016**

	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**	**51.23**	**0.00**	**37.03**	**53.08**	**0.00**	**31.54**	**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	2.2541	0.1302	3.5469	7.8100e-003		0.4611	0.4611		0.4611	0.4611	56.2015	108.8913	165.0928	0.1685	3.8100e-003	170.4412
Energy	4.8700e-003	0.0416	0.0177	2.7000e-004		3.3700e-003	3.3700e-003		3.3700e-003	3.3700e-003		53.1338	53.1338	1.0200e-003	9.7000e-004	53.4495
Mobile	0.1041	0.5259	1.3835	5.0500e-003	0.4321	4.3000e-003	0.4364	0.1156	4.0100e-003	0.1196		514.6713	514.6713	0.0269		515.3447
Total	**2.3631**	**0.6978**	**4.9481**	**0.0131**	**0.4321**	**0.4687**	**0.9008**	**0.1156**	**0.4685**	**0.5841**	**56.2015**	**676.6964**	**732.8979**	**0.1964**	**4.7800e-003**	**739.2354**

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	2.2541	0.1302	3.5469	7.8100e-003		0.4611	0.4611		0.4611	0.4611	56.2015	108.8913	165.0928	0.1685	3.8100e-003	170.4412
Energy	4.8700e-003	0.0416	0.0177	2.7000e-004		3.3700e-003	3.3700e-003		3.3700e-003	3.3700e-003		53.1338	53.1338	1.0200e-003	9.7000e-004	53.4495
Mobile	0.1041	0.5259	1.3835	5.0500e-003	0.4321	4.3000e-003	0.4364	0.1156	4.0100e-003	0.1196		514.6713	514.6713	0.0269		515.3447
Total	**2.3631**	**0.6978**	**4.9481**	**0.0131**	**0.4321**	**0.4687**	**0.9008**	**0.1156**	**0.4685**	**0.5841**	**56.2015**	**676.6964**	**732.8979**	**0.1964**	**4.7800e-003**	**739.2354**

	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	Grading	Grading	1/1/2021	3/3/2021	5	44	
2	Building Construction	Building Construction	3/4/2021	9/8/2022	5	396	
3	Paving	Paving	7/11/2022	8/9/2022	5	22	
4	Architectural Coating	Architectural Coating	8/10/2022	9/8/2022	5	22	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 6.07

Acres of Paving: 0

Residential Indoor: 62,775; Residential Outdoor: 20,925; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Grading	Excavators	1	8.00	158	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	130	0.42
Paving	Rollers	2	8.00	80	0.38
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Paving	Paving Equipment	2	8.00	132	0.36
Building Construction	Welders	1	8.00	46	0.45

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
Grading	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	10.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	10.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 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					6.1684	0.0000	6.1684	3.3260	0.0000	3.3260			0.0000			0.0000
Off-Road	2.2903	24.7367	15.8575	0.0296		1.1599	1.1599		1.0671	1.0671		2,871.9285	2,871.9285	0.9288		2,895.1495
Total	**2.2903**	**24.7367**	**15.8575**	**0.0296**	**6.1684**	**1.1599**	**7.3283**	**3.3260**	**1.0671**	**4.3931**		**2,871.9285**	**2,871.9285**	**0.9288**		**2,895.1495**

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	0.0715	0.0489	0.5524	1.6100e-003	0.1677	1.3500e-003	0.1690	0.0445	1.2500e-003	0.0457		160.8377	160.8377	4.7300e-003		160.9560
Total	**0.0715**	**0.0489**	**0.5524**	**1.6100e-003**	**0.1677**	**1.3500e-003**	**0.1690**	**0.0445**	**1.2500e-003**	**0.0457**		**160.8377**	**160.8377**	**4.7300e-003**		**160.9560**

3.2 Grading - 2021

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					2.7758	0.0000	2.7758	1.4967	0.0000	1.4967			0.0000			0.0000
Off-Road	2.2903	24.7367	15.8575	0.0296		1.1599	1.1599		1.0671	1.0671	0.0000	2,871.928 5	2,871.928 5	0.9288		2,895.149 5
Total	**2.2903**	**24.7367**	**15.8575**	**0.0296**	**2.7758**	**1.1599**	**3.9357**	**1.4967**	**1.0671**	**2.5638**	**0.0000**	**2,871.928 5**	**2,871.928 5**	**0.9288**		**2,895.149 5**

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	0.0715	0.0489	0.5524	1.6100e-003	0.1677	1.3500e-003	0.1690	0.0445	1.2500e-003	0.0457		160.8377	160.8377	4.7300e-003		160.9560
Total	**0.0715**	**0.0489**	**0.5524**	**1.6100e-003**	**0.1677**	**1.3500e-003**	**0.1690**	**0.0445**	**1.2500e-003**	**0.0457**		**160.8377**	**160.8377**	**4.7300e-003**		**160.9560**

3.3 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	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013		2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**		**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

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	3.1900e-003	0.0969	0.0281	2.5000e-004	6.4000e-003	2.0000e-004	6.6100e-003	1.8400e-003	2.0000e-004	2.0400e-003		26.7346	26.7346	1.7300e-003		26.7777
Worker	0.0477	0.0326	0.3683	1.0800e-003	0.1118	9.0000e-004	0.1127	0.0296	8.3000e-004	0.0305		107.2251	107.2251	3.1600e-003		107.3040
Total	**0.0509**	**0.1295**	**0.3963**	**1.3300e-003**	**0.1182**	**1.1000e-003**	**0.1193**	**0.0315**	**1.0300e-003**	**0.0325**		**133.9597**	**133.9597**	**4.8900e-003**		**134.0817**

3.3 Building Construction - 2021

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	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013	0.0000	2,553.363 9	2,553.363 9	0.6160		2,568.764 3
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**	**0.0000**	**2,553.363 9**	**2,553.363 9**	**0.6160**		**2,568.764 3**

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	3.1900e-003	0.0969	0.0281	2.5000e-004	6.4000e-003	2.0000e-004	6.6100e-003	1.8400e-003	2.0000e-004	2.0400e-003		26.7346	26.7346	1.7300e-003		26.7777
Worker	0.0477	0.0326	0.3683	1.0800e-003	0.1118	9.0000e-004	0.1127	0.0296	8.3000e-004	0.0305		107.2251	107.2251	3.1600e-003		107.3040
Total	**0.0509**	**0.1295**	**0.3963**	**1.3300e-003**	**0.1182**	**1.1000e-003**	**0.1193**	**0.0315**	**1.0300e-003**	**0.0325**		**133.9597**	**133.9597**	**4.8900e-003**		**134.0817**

3.3 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	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612		2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**		**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

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	3.0000e-003	0.0921	0.0266	2.5000e-004	6.4000e-003	1.8000e-004	6.5800e-003	1.8400e-003	1.7000e-004	2.0100e-003		26.4970	26.4970	1.6700e-003		26.5387
Worker	0.0448	0.0295	0.3392	1.0400e-003	0.1118	8.7000e-004	0.1127	0.0296	8.1000e-004	0.0305		103.4570	103.4570	2.8500e-003		103.5282
Total	**0.0478**	**0.1215**	**0.3658**	**1.2900e-003**	**0.1182**	**1.0500e-003**	**0.1192**	**0.0315**	**9.8000e-004**	**0.0325**		**129.9540**	**129.9540**	**4.5200e-003**		**130.0668**

3.3 Building Construction - 2022

Mitigated Construction On-Site

Category	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
	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612	0.0000	2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**	**0.0000**	**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

Mitigated Construction Off-Site

Category	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
	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	3.0000e-003	0.0921	0.0266	2.5000e-004	6.4000e-003	1.8000e-004	6.5800e-003	1.8400e-003	1.7000e-004	2.0100e-003		26.4970	26.4970	1.6700e-003		26.5387
Worker	0.0448	0.0295	0.3392	1.0400e-003	0.1118	8.7000e-004	0.1127	0.0296	8.1000e-004	0.0305		103.4570	103.4570	2.8500e-003		103.5282
Total	**0.0478**	**0.1215**	**0.3658**	**1.2900e-003**	**0.1182**	**1.0500e-003**	**0.1192**	**0.0315**	**9.8000e-004**	**0.0325**		**129.9540**	**129.9540**	**4.5200e-003**		**130.0668**

3.4 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	1.1028	11.1249	14.5805	0.0228		0.5679	0.5679		0.5225	0.5225		2,207.6603	2,207.6603	0.7140		2,225.5104
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1028**	**11.1249**	**14.5805**	**0.0228**		**0.5679**	**0.5679**		**0.5225**	**0.5225**		**2,207.6603**	**2,207.6603**	**0.7140**		**2,225.5104**

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	0.0672	0.0442	0.5088	1.5600e-003	0.1677	1.3100e-003	0.1690	0.0445	1.2100e-003	0.0457		155.1854	155.1854	4.2700e-003		155.2922
Total	**0.0672**	**0.0442**	**0.5088**	**1.5600e-003**	**0.1677**	**1.3100e-003**	**0.1690**	**0.0445**	**1.2100e-003**	**0.0457**		**155.1854**	**155.1854**	**4.2700e-003**		**155.2922**

3.4 Paving - 2022

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	1.1028	11.1249	14.5805	0.0228		0.5679	0.5679		0.5225	0.5225	0.0000	2,207.6603	2,207.6603	0.7140		2,225.5104
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1028**	**11.1249**	**14.5805**	**0.0228**		**0.5679**	**0.5679**		**0.5225**	**0.5225**	**0.0000**	**2,207.6603**	**2,207.6603**	**0.7140**		**2,225.5104**

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	0.0672	0.0442	0.5088	1.5600e-003	0.1677	1.3100e-003	0.1690	0.0445	1.2100e-003	0.0457		155.1854	155.1854	4.2700e-003		155.2922
Total	**0.0672**	**0.0442**	**0.5088**	**1.5600e-003**	**0.1677**	**1.3100e-003**	**0.1690**	**0.0445**	**1.2100e-003**	**0.0457**		**155.1854**	**155.1854**	**4.2700e-003**		**155.2922**

3.5 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	8.8170					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	**9.0216**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

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	0.0448	0.0295	0.3392	1.0400e-003	0.1118	8.7000e-004	0.1127	0.0296	8.1000e-004	0.0305		103.4570	103.4570	2.8500e-003		103.5282
Total	**0.0448**	**0.0295**	**0.3392**	**1.0400e-003**	**0.1118**	**8.7000e-004**	**0.1127**	**0.0296**	**8.1000e-004**	**0.0305**		**103.4570**	**103.4570**	**2.8500e-003**		**103.5282**

3.5 Architectural Coating - 2022

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	8.8170					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	**9.0216**	**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**

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	0.0448	0.0295	0.3392	1.0400e-003	0.1118	8.7000e-004	0.1127	0.0296	8.1000e-004	0.0305		103.4570	103.4570	2.8500e-003		103.5282
Total	**0.0448**	**0.0295**	**0.3392**	**1.0400e-003**	**0.1118**	**8.7000e-004**	**0.1127**	**0.0296**	**8.1000e-004**	**0.0305**		**103.4570**	**103.4570**	**2.8500e-003**		**103.5282**

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	0.1041	0.5259	1.3835	5.0500e-003	0.4321	4.3000e-003	0.4364	0.1156	4.0100e-003	0.1196		514.6713	514.6713	0.0269		515.3447
Unmitigated	0.1041	0.5259	1.3835	5.0500e-003	0.4321	4.3000e-003	0.4364	0.1156	4.0100e-003	0.1196		514.6713	514.6713	0.0269		515.3447

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	57.12	59.46	51.72	193,694	193,694
Total	57.12	59.46	51.72	193,694	193,694

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
Single Family Housing	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876

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	4.8700e-003	0.0416	0.0177	2.7000e-004		3.3700e-003	3.3700e-003		3.3700e-003	3.3700e-003		53.1338	53.1338	1.0200e-003	9.7000e-004	53.4495
NaturalGas Unmitigated	4.8700e-003	0.0416	0.0177	2.7000e-004		3.3700e-003	3.3700e-003		3.3700e-003	3.3700e-003		53.1338	53.1338	1.0200e-003	9.7000e-004	53.4495

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					
Single Family Housing	451.637	4.8700e-003	0.0416	0.0177	2.7000e-004		3.3700e-003	3.3700e-003		3.3700e-003	3.3700e-003		53.1338	53.1338	1.0200e-003	9.7000e-004	53.4495
Total		**4.8700e-003**	**0.0416**	**0.0177**	**2.7000e-004**		**3.3700e-003**	**3.3700e-003**		**3.3700e-003**	**3.3700e-003**		**53.1338**	**53.1338**	**1.0200e-003**	**9.7000e-004**	**53.4495**

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					
Single Family Housing	0.451637	4.8700e-003	0.0416	0.0177	2.7000e-004		3.3700e-003	3.3700e-003		3.3700e-003	3.3700e-003		53.1338	53.1338	1.0200e-003	9.7000e-004	53.4495
Total		**4.8700e-003**	**0.0416**	**0.0177**	**2.7000e-004**		**3.3700e-003**	**3.3700e-003**		**3.3700e-003**	**3.3700e-003**		**53.1338**	**53.1338**	**1.0200e-003**	**9.7000e-004**	**53.4495**

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	2.2541	0.1302	3.5469	7.8100e-003		0.4611	0.4611		0.4611	0.4611	56.2015	108.8913	165.0928	0.1685	3.8100e-003	170.4412
Unmitigated	2.2541	0.1302	3.5469	7.8100e-003		0.4611	0.4611		0.4611	0.4611	56.2015	108.8913	165.0928	0.1685	3.8100e-003	170.4412

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	0.0531					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.6138					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	1.5722	0.1245	3.0513	7.7800e-003		0.4583	0.4583		0.4583	0.4583	56.2015	108.0000	164.2015	0.1676	3.8100e-003	169.5283
Landscaping	0.0150	5.7200e-003	0.4955	3.0000e-005		2.7400e-003	2.7400e-003		2.7400e-003	2.7400e-003		0.8913	0.8913	8.6000e-004		0.9128
Total	**2.2541**	**0.1302**	**3.5469**	**7.8100e-003**		**0.4611**	**0.4611**		**0.4611**	**0.4611**	**56.2015**	**108.8913**	**165.0928**	**0.1685**	**3.8100e-003**	**170.4412**

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	0.0531					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.6138					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	1.5722	0.1245	3.0513	7.7800e-003		0.4583	0.4583		0.4583	0.4583	56.2015	108.0000	164.2015	0.1676	3.8100e-003	169.5283
Landscaping	0.0150	5.7200e-003	0.4955	3.0000e-005		2.7400e-003	2.7400e-003		2.7400e-003	2.7400e-003		0.8913	0.8913	8.6000e-004		0.9128
Total	**2.2541**	**0.1302**	**3.5469**	**7.8100e-003**		**0.4611**	**0.4611**		**0.4611**	**0.4611**	**56.2015**	**108.8913**	**165.0928**	**0.1685**	**3.8100e-003**	**170.4412**

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

1901 Royal Oaks

Los Angeles-South Coast County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	6.00	Dwelling Unit	6.07	31,000.00	17

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 33

Climate Zone 9 **Operational Year** 2022

Utility Company Southern California Edison

CO2 Intensity (lb/MWhr) 702.44 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Project description.

Construction Phase - Estimated schedule.

Grading - No soil import/export.

Trips and VMT - Added worker trips.

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	20.00	22.00
tblConstructionPhase	NumDays	230.00	396.00
tblConstructionPhase	NumDays	20.00	44.00
tblConstructionPhase	NumDays	20.00	22.00
tblConstructionPhase	PhaseEndDate	3/24/2022	9/8/2022
tblConstructionPhase	PhaseEndDate	1/27/2022	9/8/2022
tblConstructionPhase	PhaseEndDate	3/11/2021	3/3/2021
tblConstructionPhase	PhaseEndDate	2/24/2022	8/9/2022
tblConstructionPhase	PhaseStartDate	2/25/2022	8/10/2022
tblConstructionPhase	PhaseStartDate	3/12/2021	3/4/2021
tblConstructionPhase	PhaseStartDate	2/12/2021	1/1/2021
tblConstructionPhase	PhaseStartDate	1/28/2022	7/11/2022
tblGrading	AcresOfGrading	22.00	6.07
tblLandUse	LandUseSquareFeet	10,800.00	31,000.00
tblLandUse	LotAcreage	1.95	6.07
tblTripsAndVMT	WorkerTripNumber	2.00	10.00
tblTripsAndVMT	WorkerTripNumber	0.00	10.00

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	2.3546	24.7809	17.0034	0.0314	6.3361	1.1613	7.4973	3.3705	1.0684	4.4389	0.0000	3,042.7440	3,042.7440	0.9339	0.0000	3,066.0908
2022	10.8110	26.8994	31.8969	0.0527	0.2858	1.3793	1.6651	0.0760	1.2858	1.3618	0.0000	5,063.9206	5,063.9206	1.3351	0.0000	5,097.2979
Maximum	**10.8110**	**26.8994**	**31.8969**	**0.0527**	**6.3361**	**1.3793**	**7.4973**	**3.3705**	**1.2858**	**4.4389**	**0.0000**	**5,063.9206**	**5,063.9206**	**1.3351**	**0.0000**	**5,097.2979**

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	2.3546	24.7809	17.0034	0.0314	2.9434	1.1613	4.1047	1.5412	1.0684	2.6095	0.0000	3,042.7440	3,042.7440	0.9339	0.0000	3,066.0908
2022	10.8110	26.8994	31.8969	0.0527	0.2858	1.3793	1.6651	0.0760	1.2858	1.3618	0.0000	5,063.9206	5,063.9206	1.3351	0.0000	5,097.2979
Maximum	**10.8110**	**26.8994**	**31.8969**	**0.0527**	**2.9434**	**1.3793**	**4.1047**	**1.5412**	**1.2858**	**2.6095**	**0.0000**	**5,063.9206**	**5,063.9206**	**1.3351**	**0.0000**	**5,097.2979**

	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**	**51.23**	**0.00**	**37.03**	**53.08**	**0.00**	**31.54**	**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	2.2541	0.1302	3.5469	7.8100e-003		0.4611	0.4611		0.4611	0.4611	56.2015	108.8913	165.0928	0.1685	3.8100e-003	170.4412
Energy	4.8700e-003	0.0416	0.0177	2.7000e-004		3.3700e-003	3.3700e-003		3.3700e-003	3.3700e-003		53.1338	53.1338	1.0200e-003	9.7000e-004	53.4495
Mobile	0.1072	0.5133	1.4603	5.3100e-003	0.4321	4.2800e-003	0.4363	0.1156	3.9900e-003	0.1196		540.6804	540.6804	0.0270		541.3562
Total	**2.3662**	**0.6852**	**5.0248**	**0.0134**	**0.4321**	**0.4687**	**0.9008**	**0.1156**	**0.4684**	**0.5841**	**56.2015**	**702.7055**	**758.9070**	**0.1965**	**4.7800e-003**	**765.2468**

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	2.2541	0.1302	3.5469	7.8100e-003		0.4611	0.4611		0.4611	0.4611	56.2015	108.8913	165.0928	0.1685	3.8100e-003	170.4412
Energy	4.8700e-003	0.0416	0.0177	2.7000e-004		3.3700e-003	3.3700e-003		3.3700e-003	3.3700e-003		53.1338	53.1338	1.0200e-003	9.7000e-004	53.4495
Mobile	0.1072	0.5133	1.4603	5.3100e-003	0.4321	4.2800e-003	0.4363	0.1156	3.9900e-003	0.1196		540.6804	540.6804	0.0270		541.3562
Total	**2.3662**	**0.6852**	**5.0248**	**0.0134**	**0.4321**	**0.4687**	**0.9008**	**0.1156**	**0.4684**	**0.5841**	**56.2015**	**702.7055**	**758.9070**	**0.1965**	**4.7800e-003**	**765.2468**

	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	Grading	Grading	1/1/2021	3/3/2021	5	44	
2	Building Construction	Building Construction	3/4/2021	9/8/2022	5	396	
3	Paving	Paving	7/11/2022	8/9/2022	5	22	
4	Architectural Coating	Architectural Coating	8/10/2022	9/8/2022	5	22	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 6.07

Acres of Paving: 0

Residential Indoor: 62,775; Residential Outdoor: 20,925; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Grading	Excavators	1	8.00	158	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	130	0.42
Paving	Rollers	2	8.00	80	0.38
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Paving	Paving Equipment	2	8.00	132	0.36
Building Construction	Welders	1	8.00	46	0.45

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
Grading	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	10.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	10.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 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					6.1684	0.0000	6.1684	3.3260	0.0000	3.3260			0.0000			0.0000
Off-Road	2.2903	24.7367	15.8575	0.0296		1.1599	1.1599		1.0671	1.0671		2,871.928 5	2,871.928 5	0.9288		2,895.149 5
Total	**2.2903**	**24.7367**	**15.8575**	**0.0296**	**6.1684**	**1.1599**	**7.3283**	**3.3260**	**1.0671**	**4.3931**		**2,871.928 5**	**2,871.928 5**	**0.9288**		**2,895.149 5**

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	0.0643	0.0442	0.6042	1.7100e-003	0.1677	1.3500e-003	0.1690	0.0445	1.2500e-003	0.0457		170.8155	170.8155	5.0300e-003		170.9413
Total	**0.0643**	**0.0442**	**0.6042**	**1.7100e-003**	**0.1677**	**1.3500e-003**	**0.1690**	**0.0445**	**1.2500e-003**	**0.0457**		**170.8155**	**170.8155**	**5.0300e-003**		**170.9413**

3.2 Grading - 2021

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					2.7758	0.0000	2.7758	1.4967	0.0000	1.4967			0.0000			0.0000
Off-Road	2.2903	24.7367	15.8575	0.0296		1.1599	1.1599		1.0671	1.0671	0.0000	2,871.928 5	2,871.928 5	0.9288		2,895.149 5
Total	**2.2903**	**24.7367**	**15.8575**	**0.0296**	**2.7758**	**1.1599**	**3.9357**	**1.4967**	**1.0671**	**2.5638**	**0.0000**	**2,871.928 5**	**2,871.928 5**	**0.9288**		**2,895.149 5**

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	0.0643	0.0442	0.6042	1.7100e-003	0.1677	1.3500e-003	0.1690	0.0445	1.2500e-003	0.0457		170.8155	170.8155	5.0300e-003		170.9413
Total	**0.0643**	**0.0442**	**0.6042**	**1.7100e-003**	**0.1677**	**1.3500e-003**	**0.1690**	**0.0445**	**1.2500e-003**	**0.0457**		**170.8155**	**170.8155**	**5.0300e-003**		**170.9413**

3.3 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	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013		2,553.363 9	2,553.363 9	0.6160		2,568.764 3
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**		**2,553.363 9**	**2,553.363 9**	**0.6160**		**2,568.764 3**

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	3.0400e-003	0.0971	0.0254	2.6000e-004	6.4000e-003	2.0000e-004	6.6000e-003	1.8400e-003	1.9000e-004	2.0300e-003		27.4881	27.4881	1.6200e-003		27.5286
Worker	0.0429	0.0295	0.4028	1.1400e-003	0.1118	9.0000e-004	0.1127	0.0296	8.3000e-004	0.0305		113.8770	113.8770	3.3600e-003		113.9609
Total	**0.0459**	**0.1266**	**0.4282**	**1.4000e-003**	**0.1182**	**1.1000e-003**	**0.1193**	**0.0315**	**1.0200e-003**	**0.0325**		**141.3651**	**141.3651**	**4.9800e-003**		**141.4894**

3.3 Building Construction - 2021

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	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013	0.0000	2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**	**0.0000**	**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

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	3.0400e-003	0.0971	0.0254	2.6000e-004	6.4000e-003	2.0000e-004	6.6000e-003	1.8400e-003	1.9000e-004	2.0300e-003		27.4881	27.4881	1.6200e-003		27.5286
Worker	0.0429	0.0295	0.4028	1.1400e-003	0.1118	9.0000e-004	0.1127	0.0296	8.3000e-004	0.0305		113.8770	113.8770	3.3600e-003		113.9609
Total	**0.0459**	**0.1266**	**0.4282**	**1.4000e-003**	**0.1182**	**1.1000e-003**	**0.1193**	**0.0315**	**1.0200e-003**	**0.0325**		**141.3651**	**141.3651**	**4.9800e-003**		**141.4894**

3.3 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	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612		2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**		**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

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	2.8500e-003	0.0923	0.0240	2.5000e-004	6.4000e-003	1.7000e-004	6.5800e-003	1.8400e-003	1.7000e-004	2.0100e-003		27.2486	27.2486	1.5600e-003		27.2877
Worker	0.0402	0.0266	0.3716	1.1000e-003	0.1118	8.7000e-004	0.1127	0.0296	8.1000e-004	0.0305		109.8712	109.8712	3.0300e-003		109.9470
Total	**0.0430**	**0.1189**	**0.3956**	**1.3500e-003**	**0.1182**	**1.0400e-003**	**0.1192**	**0.0315**	**9.8000e-004**	**0.0325**		**137.1198**	**137.1198**	**4.5900e-003**		**137.2347**

3.3 Building Construction - 2022

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	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612	0.0000	2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**	**0.0000**	**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

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	2.8500e-003	0.0923	0.0240	2.5000e-004	6.4000e-003	1.7000e-004	6.5800e-003	1.8400e-003	1.7000e-004	2.0100e-003		27.2486	27.2486	1.5600e-003		27.2877
Worker	0.0402	0.0266	0.3716	1.1000e-003	0.1118	8.7000e-004	0.1127	0.0296	8.1000e-004	0.0305		109.8712	109.8712	3.0300e-003		109.9470
Total	**0.0430**	**0.1189**	**0.3956**	**1.3500e-003**	**0.1182**	**1.0400e-003**	**0.1192**	**0.0315**	**9.8000e-004**	**0.0325**		**137.1198**	**137.1198**	**4.5900e-003**		**137.2347**

3.4 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	1.1028	11.1249	14.5805	0.0228		0.5679	0.5679		0.5225	0.5225		2,207.660 3	2,207.660 3	0.7140		2,225.510 4
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1028**	**11.1249**	**14.5805**	**0.0228**		**0.5679**	**0.5679**		**0.5225**	**0.5225**		**2,207.660 3**	**2,207.660 3**	**0.7140**		**2,225.510 4**

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	0.0602	0.0399	0.5574	1.6500e-003	0.1677	1.3100e-003	0.1690	0.0445	1.2100e-003	0.0457		164.8069	164.8069	4.5500e-003		164.9206
Total	**0.0602**	**0.0399**	**0.5574**	**1.6500e-003**	**0.1677**	**1.3100e-003**	**0.1690**	**0.0445**	**1.2100e-003**	**0.0457**		**164.8069**	**164.8069**	**4.5500e-003**		**164.9206**

3.4 Paving - 2022

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	1.1028	11.1249	14.5805	0.0228		0.5679	0.5679		0.5225	0.5225	0.0000	2,207.6603	2,207.6603	0.7140		2,225.5104
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1028**	**11.1249**	**14.5805**	**0.0228**		**0.5679**	**0.5679**		**0.5225**	**0.5225**	**0.0000**	**2,207.6603**	**2,207.6603**	**0.7140**		**2,225.5104**

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	0.0602	0.0399	0.5574	1.6500e-003	0.1677	1.3100e-003	0.1690	0.0445	1.2100e-003	0.0457		164.8069	164.8069	4.5500e-003		164.9206
Total	**0.0602**	**0.0399**	**0.5574**	**1.6500e-003**	**0.1677**	**1.3100e-003**	**0.1690**	**0.0445**	**1.2100e-003**	**0.0457**		**164.8069**	**164.8069**	**4.5500e-003**		**164.9206**

3.5 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	8.8170					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	**9.0216**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

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	0.0402	0.0266	0.3716	1.1000e-003	0.1118	8.7000e-004	0.1127	0.0296	8.1000e-004	0.0305		109.8712	109.8712	3.0300e-003		109.9470
Total	**0.0402**	**0.0266**	**0.3716**	**1.1000e-003**	**0.1118**	**8.7000e-004**	**0.1127**	**0.0296**	**8.1000e-004**	**0.0305**		**109.8712**	**109.8712**	**3.0300e-003**		**109.9470**

3.5 Architectural Coating - 2022

Mitigated Construction On-Site

Category	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
	lb/day										lb/day					
Archit. Coating	8.8170					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	**9.0216**	**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**

Mitigated Construction Off-Site

Category	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
	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	0.0402	0.0266	0.3716	1.1000e-003	0.1118	8.7000e-004	0.1127	0.0296	8.1000e-004	0.0305		109.8712	109.8712	3.0300e-003		109.9470
Total	**0.0402**	**0.0266**	**0.3716**	**1.1000e-003**	**0.1118**	**8.7000e-004**	**0.1127**	**0.0296**	**8.1000e-004**	**0.0305**		**109.8712**	**109.8712**	**3.0300e-003**		**109.9470**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Category	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
	lb/day										lb/day					
Mitigated	0.1072	0.5133	1.4603	5.3100e-003	0.4321	4.2800e-003	0.4363	0.1156	3.9900e-003	0.1196		540.6804	540.6804	0.0270		541.3562
Unmitigated	0.1072	0.5133	1.4603	5.3100e-003	0.4321	4.2800e-003	0.4363	0.1156	3.9900e-003	0.1196		540.6804	540.6804	0.0270		541.3562

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	57.12	59.46	51.72	193,694	193,694
Total	57.12	59.46	51.72	193,694	193,694

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
Single Family Housing	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876

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	4.8700e-003	0.0416	0.0177	2.7000e-004		3.3700e-003	3.3700e-003		3.3700e-003	3.3700e-003		53.1338	53.1338	1.0200e-003	9.7000e-004	53.4495
NaturalGas Unmitigated	4.8700e-003	0.0416	0.0177	2.7000e-004		3.3700e-003	3.3700e-003		3.3700e-003	3.3700e-003		53.1338	53.1338	1.0200e-003	9.7000e-004	53.4495

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					
Single Family Housing	451.637	4.8700e-003	0.0416	0.0177	2.7000e-004		3.3700e-003	3.3700e-003		3.3700e-003	3.3700e-003		53.1338	53.1338	1.0200e-003	9.7000e-004	53.4495
Total		**4.8700e-003**	**0.0416**	**0.0177**	**2.7000e-004**		**3.3700e-003**	**3.3700e-003**		**3.3700e-003**	**3.3700e-003**		**53.1338**	**53.1338**	**1.0200e-003**	**9.7000e-004**	**53.4495**

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					
Single Family Housing	0.451637	4.8700e-003	0.0416	0.0177	2.7000e-004		3.3700e-003	3.3700e-003		3.3700e-003	3.3700e-003		53.1338	53.1338	1.0200e-003	9.7000e-004	53.4495
Total		**4.8700e-003**	**0.0416**	**0.0177**	**2.7000e-004**		**3.3700e-003**	**3.3700e-003**		**3.3700e-003**	**3.3700e-003**		**53.1338**	**53.1338**	**1.0200e-003**	**9.7000e-004**	**53.4495**

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	2.2541	0.1302	3.5469	7.8100e-003		0.4611	0.4611		0.4611	0.4611	56.2015	108.8913	165.0928	0.1685	3.8100e-003	170.4412
Unmitigated	2.2541	0.1302	3.5469	7.8100e-003		0.4611	0.4611		0.4611	0.4611	56.2015	108.8913	165.0928	0.1685	3.8100e-003	170.4412

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	0.0531					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.6138					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	1.5722	0.1245	3.0513	7.7800e-003		0.4583	0.4583		0.4583	0.4583	56.2015	108.0000	164.2015	0.1676	3.8100e-003	169.5283
Landscaping	0.0150	5.7200e-003	0.4955	3.0000e-005		2.7400e-003	2.7400e-003		2.7400e-003	2.7400e-003		0.8913	0.8913	8.6000e-004		0.9128
Total	**2.2541**	**0.1302**	**3.5469**	**7.8100e-003**		**0.4611**	**0.4611**		**0.4611**	**0.4611**	**56.2015**	**108.8913**	**165.0928**	**0.1685**	**3.8100e-003**	**170.4412**

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	0.0531					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.6138					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	1.5722	0.1245	3.0513	7.7800e-003		0.4583	0.4583		0.4583	0.4583	56.2015	108.0000	164.2015	0.1676	3.8100e-003	169.5283
Landscaping	0.0150	5.7200e-003	0.4955	3.0000e-005		2.7400e-003	2.7400e-003		2.7400e-003	2.7400e-003		0.8913	0.8913	8.6000e-004		0.9128
Total	**2.2541**	**0.1302**	**3.5469**	**7.8100e-003**		**0.4611**	**0.4611**		**0.4611**	**0.4611**	**56.2015**	**108.8913**	**165.0928**	**0.1685**	**3.8100e-003**	**170.4412**

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

SRA 9

Localized Significance Thresholds*
Construction At 25 Meters

CO	
x-value Area of Site (acerage)	**y-value LST (mass/day)**
1	623.00
2	953.00
5	1733.00
2.50	**1057.42**

NOx	
x-value Area of Site (acerage)	**y-value LST (mass/day)**
1	89.00
2	98.00
5	203.00
2.50	**125.00**

PM_{10}	
x-value Area of Site (acerage)	**y-value LST (mass/day)**
1	5
2	7
5	14
2.50	**8.29**

$PM_{2.5}$	
x-value Area of Site (acerage)	**y-value LST (mass/day)**
1	3
2	5
5	8
2.50	**5.13**

**based on SCAQMD localized signifcance thresholds (LST) from Appendix C of the SCAQMD's CEQA Handbook*

Appendix B

Biological Assessments

Biological Assessments

Biological Constraints Report

DUDEK

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PASADENA, CALIFORNIA 91101
T: 626.204.9800

March 20, 2015 8867

Jeff Causey AIA, NCARB, LEED, AP
Studio i.e.
1902 Wright Place, Suite 200
Carlsbad, California 92008

Subject: ***Biological Constraints Report for the Royal Oaks Project (APN: 8527-021-041), City of Bradbury, Los Angeles County, California***

Dear Mr. Causey:

This report contains the results of a biological constraints analysis for the proposed Royal Oak Project (project site) in the City of Bradbury, California. This letter report is intended to: (1) describe the existing conditions of biological resources within the project site in terms of vegetation, flora, wildlife, and wildlife habitats; (2) discuss potential constraints to development of the project site; and (3) provide recommendations for avoidance of biological resources and additional actions that may be required for environmental permitting of the project with respect to biological resources.

1 PROJECT LOCATION

The approximately 12.4-acre project site is located northeast of the intersection of Royal Oaks Drive and Royal Oaks Drive North, north of Interstate 210 (I-210) and west of Interstate 605 (I-605), within the City of Bradbury, Los Angeles County, California (Figure 1; all figures are provided in Attachment A). It is comprised of Assessor's Parcel Number 8527-021-041, situated in Section 30 of Township 1 North Range 10 West of the Azusa 7.5-minute U.S. Geological Survey (USGS) quadrangle (USGS 1973) (Figure 2). The project site is located on private land approximately 1.3 miles south of the Angeles National Forest.

2 METHODS AND MATERIALS

2.1 Literature Reviewed

Prior to conducting the field investigation, a literature review was conducted to evaluate the environmental setting of the project site and identify potential special-status biological resources that may be found on the site. The review included the Azusa 7.5-minute USGS quadrangle (USGS 1973) and the County of Los Angeles GIS data portal (County of LA 2014). Additionally, a database query was conducted to identify special-status biological resources present or potentially present within the vicinity of the project site using the California Natural Diversity Database (CNDDB) (CDFW 2015), California Native Plant Society's (CNPS's) *Online Inventory of Rare and Endangered Vascular Plants* (CNPS 2015), and U.S. Fish and Wildlife Service (USFWS) species occurrence data (USFWS 2015). A 5-mile buffer around the project site was queried in the USFWS data using geographic information systems (GIS) software, and a "nine-quad" query was conducted of the CNPS and CNDD**B**. A nine-quad query includes the subject quadrangle and the eight USGS quadrangles surrounding the subject quadrangle[1].

2.2 Survey Methodology

The project site was surveyed by Dudek Biologist Johanna Page on March 5, 2015, to identify existing biological resources and potential biological constraints within the project footprint. Table 1 includes the survey date and conditions.

Table 1
Survey Date and Conditions

Date	Biologist	Time	Temperature, Cloud Cover	Wind Speeds
03/5/2015	Johanna Page	0730–1130	Start Condition: 67°F, 0%–10% End Condition: 73°F, 5%–10%	1–2 miles per hour winds

The purpose of the field survey was to determine the likelihood of occurrence of any special-status plant or wildlife species based on the presence/absence of suitable habitat and other natural history elements that might predict their occurrence. The survey area was methodically surveyed on foot, and all biological resources observed or detected were identified and inventoried. Expected wildlife usage of the site was determined according to known habitat preferences of regional wildlife species and knowledge of their relative distributions in the area. Potential for special-status plant species was assessed based on habitat and soil conditions that are known to support species occurring in the region.

2.2.1 Vegetation Community and Land Cover Mapping

Vegetation communities and land uses within the study area were mapped in the field directly onto a 100-foot-scale (1 inch =100 feet), aerial photograph-based field map of the project site.

[1] A search of the USGS 7.5-minute Azusa quadrangle and surrounding 8 quadrangles (Waterman Mountain, Crystal Lake, Mount Wilson, El Monte, Chilao Flat, Glendora, Baldwin Park, and San Dimas) was conducted for the CNDDB and CNPS searches; and a 5-mile radius search was conducted for the USFWS occurrence data.

Following completion of the fieldwork, all vegetation polygons were digitized using ArcGIS and GIS coverage was created. Vegetation community classifications used in this report are based on *Preliminary Descriptions of Terrestrial Natural Communities of California* (Holland 1986) with modifications in accordance with Oberbauer et al. (2008) to accommodate the lack of conformity of the observed communities to those included in these references.

Flora

All plant species encountered during the field surveys were identified and recorded. Those species that could not be identified immediately were brought into the laboratory for further investigation. Latin and common names for plant species with a California Rare Plant Rank (CRPR; formerly CNPS List) follow the CNPS *Inventory of Rare, Threatened, and Endangered Plants of California* (CNPS 2015). For plant species without a CRPR, Latin names follow the *Jepson Interchange List of Currently Accepted Names of Native and Naturalized Plants of California* (Jepson Flora Project 2015), and common names follow the USDA Natural Resources Conservation Service Plants Database (USDA 2015). General information regarding plant species, identification, and nomenclature was obtained from *The Jepson Manual* (Baldwin et al. 2012). A list of plant species observed in the study area is presented in Attachment C.

2.2.2 Habitat Assessment

A habitat assessment was conducted for special-status species that may potentially occur in the Project vicinity. Photo documentation of the project site is provided in Attachment B.

Fauna

Wildlife species observed or detected during field surveys by sight, calls, tracks, scat, or other signs were recorded. In addition to species actually observed, expected wildlife usage of the site was determined according to known habitat preferences of regional wildlife species and knowledge of their relative distributions in the area. No trapping or focused surveys for special-status or nocturnal species was conducted. Latin and common names of animals follow Crother (2012) for reptiles and amphibians, American Ornithologists' Union (AOU 2012) for birds, Wilson and Reeder (2005) for mammals, and North American Butterfly Association (NABA) (2001) for butterflies. A compiled list of wildlife species observed in the study area is presented in Attachment D.

2.2.3 Jurisdictional Waters

Although a formal wetlands delineation following the methodology described in *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (ACOE 2008a), 1987 *Wetlands Delineation Manual* (ACOE 1987), and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (ACOE 2008b) was not conducted during the field survey, the project area was evaluated for the potential to support jurisdictional waters regulated under the federal Clean Water Act, California Fish and Game Code, and Porter-Cologne Water Quality Act.

According to the City of Bradbury Community Resources Element Plan (2014), the City of Bradbury considers the San Gabriel River, as well as intermittent seasonal streams within canyons including Sawpit Canyon, Bliss Canyon, Bradbury Canyon and Spinks Canyon to be significant natural waterway resources. The approximately 50-acre Spinks and Bradbury Drainage Debris Basins (facilities owned, managed and maintained by the Los Angeles County Flood Control District) are also jurisdictional under the United States Army Corps of Engineers (ACOE), Regional Water Quality Control Board (RWQCB), and CDFW. These drainage debris basins collect water north of the project site, but do connect with the features on site.

3 ENVIRONMENTAL SETTING

3.1 Land Use

The City of Bradbury is located along the foothills of the San Gabriel Mountains, and is bordered by the City of Monrovia to the west, Duarte to the south and east, and the Angeles National Forest to the north. The general vicinity surrounding the project site is rural with a mix of low-density single-family residential development and undeveloped areas. The southern boundary of the site is bordered by a concrete wash and bicycle and equestrian trail, with single-family residential development occurring immediately south of the trail. A horse farm occurs along the western boundary of the site and rural residential areas with open undeveloped land occur along the eastern and northern boundaries of the site. The Angeles National Forest is approximately 1.3 miles north of the project site.

The project site is located along the foothills of the San Gabriel Mountains. The topography within the project site creates a natural divide between the southern and northern portion of the property. A single-family home present within the center of the site and another small building/home to the west serve as the northern extent of the southern half of the project site, which is the area currently proposed to be developed. The southern half of the project site is disturbed, dominated by numerous horse corrals and horse boarding areas, dirt roads, buildings, and a home with a pool. Numerous small buildings exist throughout the southern half of the project site. The vegetation within the southern portion of the site is dominated by non-native grassland, non-native vegetation, and disturbed and non-disturbed oak woodland, and is known to have supported horses for at least two decades.

The northern portion of the project site is undeveloped and comprised of natural vegetation dominated by coast live oak woodland along the canyons, with coastal sage-chaparral transition and non-native grassland along the hillsides. Two smaller canyons dominated by oak woodland occur within the central and eastern portion of the northern half of the project site. The central canyon (Drainage A) is located immediately north of the residence and the eastern canyon (Drainage B) is located along the eastern border of the project site. Both canyons direct runoff drainage flow from a north to south direction. The central canyon, located north of the residence on site, flow to a small retaining wall north of the residence, which directs the water to an underground culvert, away from the house. This drain most likely flows into the concrete wash south of the project site. The drainage along the eastern portion of the project site disseminates into the non-native grassland habitat becoming less defined.

3.2 Topography/Hydrology

The project site is located along the foothills of the San Gabriel Mountains, which is part of the Transverse Ranges, east of Spinks Canyon. Elevation at the project site ranges between approximately 565 and 830 feet above mean sea level (AMSL). The southern half of the project site is on a gradual incline from south to north, otherwise, relatively flat with elevations ranging between 565 feet AMSL and 625 feet AMSL. The northern half of the project site is comprised of rolling hills and canyons. Elevation ranges between 625 feet AMSL just north of the single-family residence towards the center of the project site, and 830 feet AMSL at the northwestern portion of the project site. The topography slopes to the southeast with ephemeral runoff flowing from north to south potentially connecting with a concrete wash approximately 15 feet south of the project site.

3.3 Soils

The Ramona loam soil, within the Ramona-Placentia Association, is the only soil mapped within the project site (County of LA 2011). Descriptions provided below are summarized from NRCS (2015).

> The Ramona soils are well drained, with slow to rapid runoff and moderately slow permeability. The soils are formed in alluvium derived mostly from granitic and related rock sources. Ramona soils occur on nearly level to moderately steep slopes of terraces and fans at elevations of 250 to 3,500 feet. The A horizons are course sandy loam to light loam with neutral to moderate acid. The A horizons contain minimal if any organic matter. The B horizons are heavy sandy loam, sandy clay loam, or loam with clay, and slightly acid to moderately alkaline. The C horizon is coarse sandy loam to loam, and is neutral to moderately alkaline. Native vegetation consists of annual grasses, forbs, chamise or chaparral.

4 RESULTS

4.1 Vegetation Communities and Land Covers

Eight vegetation communities and land covers (including disturbed form) were mapped within the project site based on general physiognomy and species composition, including: coastal sage – chaparral transition, coast live oak woodland; disturbed coast live oak woodland; disturbed habitat; extensive agriculture – field/pasture, row crops; non-native grassland; non-native vegetation; and urban/developed. These vegetation communities and land cover types are described below and depicted within Figure 4.

4.1.1 Coastal Sage – Chaparral Transition

According to Holland (1986), this vegetation community is dominated by a mix of sclerophyllous, woody chaparral species and drought-deciduous, malacophyllous sage scrub species, and is characteristically dominated by chamise (*Adenostoma fasciculatum*) and coastal sagebrush (*Artemisia californica*) equally. Laurel sumac (*Malosma laurina*), black sage (*Salvia mellifera*), and lemonade sumac (Rhus integrifolia) are typically more common in coastal sage scrub, while ceanothus (*Ceanothus* spp.) and mission manzanita (*Xylococcus bicolor*) commonly occur in chaparral. Although this vegetation community is generally a post-fire successional community, this is not true of all situations.

Coastal sage – chaparral transition occurs within the higher elevations of the northern half of the project site. However, the coastal sage – chaparral transition vegetation on site varies slightly from the Holland (1986) description in that the dominant shrubs include lemonade sumac, laurel sumac, Cucamonga manroot, and tree tobacco, with coastal sagebrush (*Artemisia californica*) and chamise (*Adenostoma fasciculatum*) being less dominant and only accounting for 5% of the absolute cover. The understory is dominated by bromes, wild oat, black mustard, and shortpod mustard.

4.1.2 Coast Live Oak Woodland

According to Holland (1986), coast live oak woodland is dominated by coast live oak (*Quercus agrifolia*), with a poorly developed shrub layer that may include toyon (*Heteromeles arbutifolia*), gooseberry (*Ribes* spp.), laurel sumac, or elderberry (*Sambucus* spp.). This woodland has a continuous herb layer dominated by a variety of introduced species.

Within the project area, coast live oak woodland was mapped in areas supporting a minimum of 40% cover of native trees, shrubs and subshrubs, dominated by coast live oak. Coast live oak woodland dominates the northern half of the project site, as well as the eastern and southern boundaries of the site. Additionally, there are small patches of coast live oak woodland and disturbed forms of this vegetation community scattered throughout the southern portion of the site. Coast live oak woodland mapped on site is dominated by coast live oak, laurel sumac, lemonade sumac (Rhus integrifolia), elderberry, tree tobacco (*Nicotiana glauca*), bromes (*Bromus* spp.), shortpod mustard (*Hirschfeldia incana*), and London rocket (*Sisymbrium irio*).

Disturbed coast live oak woodland is similar in species composition to native coast live oak woodland, but it supports anywhere from 10% to 30% cover of native vegetation dominated by coast live oak and 70% to 90% cover of non-native tree vegetation dominated by avocado (*Persea americana*), various citrus (*Citrus* spp.), and eucalyptus (*Eucalyptus* spp.) trees. Disturbed coast live oak woodland occurs in patches scattered throughout the southern half of the project site.

4.1.3 Disturbed Habitat

Disturbed habitat refers to areas that are not developed yet lack vegetation, and generally are the result of severe or repeated mechanical perturbation. Areas mapped as disturbed land may include unpaved roads, trails, and graded areas. Vegetation in these areas, if present at all, is usually sparse and dominated by non-native weedy herbaceous species.

The southern half of the project site consists of disturbed habitat including dirt roads and graded areas. There are portions of disturbed habitat where no vegetation occurs because the area is graded. Other areas less recently disturbed had some annual weedy species present including, but not limited to, bromes, shortpod mustard, black mustard, stinging nettle (*Urtica dioica*), London rocket and redstem stork's bill (*Erodium cicutarium*).

4.1.4 Extensive Agriculture – Field/Pasture, Row Crops

According to descriptions by Oberbauer (2008), extensive agriculture – field/pasture, row crops refers to areas that are planted fields (generally with monoculture crops) and irrigated. Vegetation in these areas are usually artificially seeded and maintained.

Extensive agriculture – field/pasture, row crops occur within the southern half of the project site. These areas are dominated by horse corrals and horse boarding areas. These areas are extremely disturbed and generally void of vegetation. However, where vegetation does occur it includes some ruderal species dominated by bromes and wild oat (*Avena fatua*),

4.1.5 Non-Native Grassland

Non-Native grassland is characterized by weedy, introduced annuals, primarily grasses, including wild oat (*Avena* spp.), bromes (*Bromus diandrus*, *B. madritensis*, *B. hordeaceus*), black mustard, filaree (*Erodium* spp.), and Russian-thistle (*Salsola tragus*). It may occur where disturbance by maintenance (mowing, scraping, discing, spraying, etc.), grazing, repetitive fire, agriculture, or other mechanical disruption have altered soils and removed native seed sources from areas formerly supporting native vegetation. Non-native grassland typically occurs adjacent to roads or other developed areas where there has been some historic disturbance. Non-native grassland may support special-status plant and animal species and provide valuable foraging habitat for raptors.

Within the project site, non-native grasslands are dominated by ripgut brome (*Bromus diandrus*), red brome (*Bromus madritensis* ssp. *rubens*), wild oat (*Avena fatua*), shortpod mustard, black mustard, London rocket and redstem stork's bill. Non-native grassland occurs throughout the northern and southern portions of the site; however, the composition of plants found within the northern and southern half of the project site varies slightly. The northern half of the project site is also dominated by coastal prickly pear (*Opuntia littoralis*), bluedicks (*Dichelostemma capitatum*), and Cucamonga manroot (*Marah macrocarpa*), while the southern half of the project site is more disturbed, dominated by stinging nettle, prickly Russian thistle, and castorbean (*Ricinus communis*).

4.1.6 Non-Native Vegetation

According to Oberbauer (2008), non-native vegetation is characterized by non-native species introduced and established through human action. These areas may be artificially irrigated or receive water from precipitation or runoff.

Non-native vegetation occurs within the southern half of the project site. These areas may have historically been avocado or citrus orchards; however, today only remnant scattered non-native trees exist dominated by avocado, citrus, carrotwood (*Cupaniopsis anacardioides*), Peruvian peppertree (*Schinus molle*), eucalyptus species, edible fig (*Ficus carica*), and elm (*Ulmus* sp.).

4.1.7 Urban/Developed

Developed land consists of buildings, structures, homes, parking lots, paved roads, and maintained areas. Developed areas do not support native vegetation. Disturbed habitat refers to areas that are not developed yet lack vegetation, and generally are the result of severe or repeated mechanical perturbation.

Developed land occurs in patches throughout the southern half of the project site. A residential home with a second detached house and pool is located within the central portion of the project site, and additional mobile homes are located throughout the project site. Vegetation includes a variety of ornamental and fruit trees eucalyptus, avocado, and citrus varietals, and understory of non-native grasses including bromes, wild oat, stinging nettle, castorbean, and redstem stork's bill.

4.2 Special-Status Plant Species

Although a focused special-status plant survey was not conducted for the project site, all plants detected during the site visit were recorded. No special-status plant species were identified within the site during the 2015 reconnaissance survey. Furthermore, there is no U.S. Fish and Wildlife Service (USFWS)-designated critical habitat for listed plant species within the project site (USFWS 2015).

Table 2 lists special-status plant species documented in the literature review and their potential to occur within the site based on an analysis of the elevation, soils, vegetation communities, and level of disturbance of the site in conjunction with the known distribution of special-status species in the vicinity of the project site. After assessment in the field, two special-status plant species have a moderate potential to occur within the coastal sage – chaparral transition and/or coast live oak woodland communities on site: Plummer's mariposa lily (*Calochortus plummerae,* California Rare Plant Rank [CRPR] 1B.2) and Robinson's pepper-grass (*Lepidium virginicum* var. *robinsonii*, CRPR 1B.2). No federally or state listed plant species have potential to occur within the project site.

Table 2
Special-Status Plant Species and Their Potential to Occur within Project Site

Scientific Name	Common Name	Status Federal/ State	CNPS	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Status Onsite or Potential to Occur
Anomobryum julaceum	slender silver moss	None/ None	4.2	Broadleafed upland forest, Lower montane coniferous forest, North Coast coniferous forest/damp rock and soil on outcrops, usually on road cuts/ moss/ 330-3,280	Not expected to occur. No suitable coniferous or upland forest habitat present within the project site.
Arctostaphylos glandulosa ssp. *gabrielensis*	San Gabriel manzanita	None/ None	1B.2	Chaparral(rocky)/ perennial evergreen shrub/ Mar/ 1952-4,920	Not expected to occur. The site is outside of the species' known elevation range. Additionally, this species would have been observed during the site visit if present.
Astragalus brauntonii	Braunton's milk-vetch	FE/ None	1B.1	Chaparral, Coastal scrub, Valley and foothill grassland/recent burns or disturbed areas, usually sandstone with carbonate layers/ perennial herb/ Jan-Aug/ 15-2,100	Low potential to occur. Although suitable coastal sage - chaparral transition habitat occurs on site, this species would have been observed during the site visit if present. Closest known occurrence located 2.5 miles northwest
Berberis nevinii	Nevin's barberry	FE/ SE	1B.1	Chaparral, Cismontane woodland, Coastal scrub, Riparian scrub/sandy or gravelly/ perennial evergreen shrub/ Mar-Jun/ 900-2,710	Low potential to occur. Although suitable coastal sage - chaparral transition habitat occurs on site, this species would have been observed during the site visit if present. Closest known natural occurrence located over 11 miles to the northwest.
Botrychium crenulatum	scalloped moonwort	None/ None	2.2	Bogs and fens, Lower montane coniferous forest, Meadows and seeps, Marshes and swamps(freshwater), Upper montane coniferous forest/ perennial rhizomatous herb/ Jun-Sep/ 4,160-10,760	Not expected to occur. No suitable meadows and seeps are present within the project site. Additionally, the site is between 565 and 830 feet above mean sea level (AMSL), outside of the species' known elevation range.

Table 2
Special-Status Plant Species and Their Potential to Occur within Project Site

Scientific Name	Common Name	Status Federal/ State	CNPS	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Status Onsite or Potential to Occur
Brodiaea filifolia	thread-leaved brodiaea	FT/ SE	1B.1	Chaparral(openings), Cismontane woodland, Coastal scrub, Playas, Valley and foothill grassland, Vernal pools/often clay/ perennial bulbiferous herb/ Mar-Jun/ 80-4,000	Low potential to occur. Although suitable coastal sage - chaparral transition habitat occurs on site, this species would have been observed during the site visit if present. Closest known occurrence located 6.4 miles to the east.
California macrophylla	round-leaved filaree	None/ None	1B.1	Cismontane woodland, Valley and foothill grassland/clay/ annual herb/ Mar-May/ 50-3,940	Low potential to occur. Although suitable oak woodland and grassland habitats occur on site, this species prefers clay soils not present on site. Additionally, the closest known natural occurrence located over 11 miles to the northwest.
Calochortus clavatus var. *gracilis*	slender mariposa lily	None/ None	1B.2	Chaparral, Coastal scrub, Valley and foothill grassland/ perennial bulbiferous herb/ Mar-Jun/ 1,180-3,280	Not expected to occur. Although suitable annual grassland and coastal sage - chaparral transition habitats occur on site, the site is between 565 and 830 feet AMSL, outside of the species' known elevation range.
Calochortus palmeri var. *palmeri*	Palmer's mariposa lily	None/ None	1B.2	Chaparral, Lower montane coniferous forest, Meadows and seeps/mesic/ perennial bulbiferous herb Apr-Jul/ 3,280-7,840	Not expected to occur. Although suitable coastal sage - chaparral transition habitats occur on site, these areas are not mesic. Additionally, the site is between 565 and 830 feet AMSL, outside of the species' known elevation range.

Table 2
Special-Status Plant Species and Their Potential to Occur within Project Site

Scientific Name	Common Name	Status Federal/ State	CNPS	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Status Onsite or Potential to Occur
Calochortus plummerae	Plummer's mariposa lily	None/ None	1B.2	Chaparral, Cismontane woodland, Coastal scrub, Lower montane coniferous forest, Valley and foothill grassland/granitic, rocky/ perennial bulbiferous herb/ May-Jul/ 330-5,580	Moderate potential to occur. Suitable coastal sage - chaparral transition habitats onsite. Closest known occurrence located 2.5 miles northwest.
Calochortus striatus	alkali mariposa lily	None/ None	1B.2	Chaparral, Chenopod scrub, Mojavean desert scrub, Meadows and seeps/alkaline, mesic perennial bulbiferous herb/ Apr-Jun/ 230-5,230	Not expected to occur. The site is between 565 and 830 feet AMSL, outside of the species' known elevation range.
Calochortus weedii var. *intermedius*	intermediate mariposa lily	None/ None	1B.2	Chaparral, Coastal scrub, Valley and foothill grassland/rocky, calcareous/ perennial bulbiferous herb/ May-Jul/ 340-2,805	Not expected to occur. The site is between 565 and 830 feet AMSL, outside of the species' known elevation range.
Carex occidentalis	western sedge	None/ None	2.3	Lower montane coniferous forest, Meadows and seeps/ perennial rhizomatous herb/ Jun-Aug/ 5,400-10,285	Not expected to occur. Suitable habitat (i.e., meadows and seeps) do not occur within the project site. Additionally, the site is between 565 and 830 feet AMSL, outside of the species' known elevation range.
Castilleja gleasonii	Mt. Gleason paintbrush	None/ SR	1B.2	Chaparral, Lower montane coniferous forest, Pinyon and juniper woodland/granitic/ perennial herb hemiparasitic/ May-Jun/ 3,810-7,120	Not expected to occur. The site is between 565 and 830 feet AMSL, outside of the species' known elevation range.
Centromadia parryi ssp. *australis*	southern tarplant	None/ None	1B.1	Marshes and swamps(margins), Valley and foothill grassland(vernally mesic), Vernal pools/ annual herb/ May-Nov/ 0-1,400	Not expected to occur. No suitable vernally mesic habitats onsite. Additionally, the closest known natural occurrence located over 11 miles to the northwest.

Table 2
Special-Status Plant Species and Their Potential to Occur within Project Site

Scientific Name	Common Name	Status Federal/ State	CNPS	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Status Onsite or Potential to Occur
Chorizanthe parryi var. *fernandina*	San Fernando Valley spineflower	FC/ SE	1B.1	Coastal scrub(sandy), Valley and foothill grassland/ annual herb/ Apr-Jul/ 490-4,000	Not expected to occur. Although annual grassland and coastal sage – chaparral transition habitats occur on site, the site is between 565 and 830 feet AMSL, outside of the species' known elevation range.
Chorizanthe parryi var. *parryi*	Parry's spineflower	None/ None	1B.1	Chaparral, Cismontane woodland, Coastal scrub, Valley and foothill grassland/sandy or rocky, openings/ annual herb/ Apr-Jun/ 900-4,000	Low potential to occur. Although suitable annual grassland and coastal sage – chaparral transition habitats occur on site, the loam soils within the project site are not suitable. Closest known natural occurrence located over 1.5 miles to the southeast.
Cladium californicum	California sawgrass	None/ None	2.2	Meadows and seeps, Marshes and swamps, Alkaline or Freshwater/ rhizomatous herb/ Jun-Sep/ 200-2,000	Not expected to occur. No suitable meadows and seeps or marshes and swamps occur on site.
Claytonia lanceolata var. *peirsonii*	Peirson's spring beauty	None/ None	3.1	Subalpine coniferous forest, Upper montane coniferous forest/Scree/ perennial herb/ (Mar),May-Jun/ 4954-9006	Not expected to occur. No suitable coniferous habitat present on site.
Cuscuta obtusiflora var. *glandulosa*	Perunvian dodder	None/ None	2B.2	Marshes and swamps(freshwater)/ annual vine (parasitic)/ Jul-Oct/ 49-919	Not expected to occur. No suitable marsh or swamps present on site.
Dodecahema leptoceras	slender-horned spineflower	FE/ SE	1B.1	Chaparral, Cismontane woodland, Coastal scrub(alluvial fan)/sandy/ annual herb/ Apr-Jun/ 660-2,490	Low potential to occur. Although suitable oak woodland and coastal sage - chaparral transition habitats occur on site, the loam soils within the project site are not suitable to support this species. Closest known occurrence located 2.5 miles northwest.

Table 2
Special-Status Plant Species and Their Potential to Occur within Project Site

Scientific Name	Common Name	Status Federal/ State	CNPS	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Status Onsite or Potential to Occur
Drymocallis cuneifolia var. *ewanii*	Ewan's woodbeauty	None/ None	1B.3	Lower montane coniferous forest(near seeps and springs), Meadows and seeps/ perennial herb/ Jun-Jul/ 6234-7874	Not expected to occur. No suitable mesic habitat occurs within the project site. Additionally, the site is between 565 and 830 feet AMSL, outside of the species' known elevation range.
Dudleya cymosa ssp. *crebrifolia*	San Gabriel River dudleya	None/ None	1B.2	Chaparral(granitic)/ perennial herb/ Apr-Jul/ 900-1,500	Low potential to occur. Although suitable coastal sage - chaparral transition habitat occurs on site, chaparral habitat on site is limited. Additionally, this species would have been observed if present within the project site. Closest known natural occurrence located over 2.6 miles to the northeast.
Dudleya densiflora	San Gabriel Mountains dudleya	None/ None	1B.1	Chaparral, Cismontane woodland, Coastal scrub, Lower montane coniferous forest, Riparian woodland/granitic, cliffs and canyon walls/ perennial herb Mar-Jun/ 800-2,000	Low potential to occur. Although suitable coastal sage - chaparral transition habitat occurs on site, this species would have been observed if present within the project site. Closest known natural occurrence located over 2.6 miles to the northeast.
Dudleya multicaulis	many-stemmed dudleya	None/ None	1B.2	Chaparral, Coastal scrub, Valley and foothill grassland/often clay/ perennial herb/ Apr-Jul/ 50-2,590	Low potential to occur. Although suitable coastal sage - chaparral transition habitat occurs on site, this species would have been observed if present within the project site. Closest known natural occurrence located over 3.2 miles to the east.

Table 2
Special-Status Plant Species and Their Potential to Occur within Project Site

Scientific Name	Common Name	Status Federal/ State	CNPS	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Status Onsite or Potential to Occur
Eriogonum kennedyi var. *alpigenum*	southern alpine buckwheat	None/ None	1B.3	Alpine boulder and rock field, Subalpine coniferous forest/granitic, gravelly/ perennial herb/ Jul-Sep/ 8,530-11,480	Not expected to occur. No suitable coniferous habitat occurs within the project site. Additionally, the site is between 565 and 830 feet AMSL, outside of the species' known elevation range.
Fimbristylis thermalis	hot springs fimbristylis	None/ None	2.2	Meadows and seeps(alkaline, near hot springs)/ perennial rhizomatous herb. Jul-Sep/ 360-4,400	Not expected to occur. No suitable meadows and seeps occur on site.
Galium grande	San Gabriel bedstraw	None/ None	1B.2	Broadleafed upland forest, Chaparral, Cismontane woodland, Lower montane coniferous forest perennial deciduous shrub/ Jan-Jul/ 1,390-4,920	Not expected to occur. The site is between 565 and 830 feet AMSL, outside of the species' known elevation range.
Horkelia cuneata ssp. *puberula*	mesa horkelia	None/ None	1B.1	Chaparral(maritime), Cismontane woodland, Coastal scrub/sandy or gravelly/ perennial herb Feb-Jul(Sep)/ 230-2,660	Low potential to occur. Although suitable oak woodland and coastal sage - chaparral transition habitats occur on site, this species would have been observed if present within the project site. Closest known natural occurrence located over 2.2 miles to the south.
Imperata brevifolia	California satintail	None/ None	2.1	Chaparral, Coastal scrub, Mojavean desert scrub, Meadows and seeps often alkali, Riparian scrub/mesic/ perennial rhizomatous herb/ Sep-May/ 0-1,640	Low potential to occur. Although coastal sage - chaparral transition habitat is present on site, this species requires mesic habitats, not present. Closest known natural occurrence located over 3.75 miles to the northeast. Additionally, this species would have been observed if present within the project site.

Table 2
Special-Status Plant Species and Their Potential to Occur within Project Site

Scientific Name	Common Name	Status Federal/ State	CNPS	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Status Onsite or Potential to Occur
Lasthenia glabrata ssp. *coulteri*	Coulter's goldfields	None/ None	1B.1	Marshes and swamps (coastal salt)/ Playas/ Vernal pools/ annual herb/ Feb-Jun/ 3-4,000	Not expected to occur. No suitable mesic habitat present on site.
Lepidium virginicum var. *robinsonii*	Robinson's pepper-grass	None/ None	1B.2	Chaparral, Coastal scrub/ annual herb/ Jan-Jul/ 3-2,900	Low potential to occur. Suitable coastal sage - chaparral transition habitat occurs on site. Closest known natural occurrence located over 2 miles to the southeast; however, this species was not observed during the site visit that occurred in March 2015.
Lilium parryi	lemon lily	None/ None	1B.2	Lower montane coniferous forest, Meadows and seeps, Riparian forest, Upper montane coniferous forest/mesic/ perennial bulbiferous herb/ Jul-Aug/ 4,000-9,010	Not expected to occur. No suitable forest and mesic habitat occurs within the project site. Additionally, the site is between 565 and 830 feet AMSL, outside of the species' known elevation range.
Linanthus concinnus	San Gabriel linanthus	None/ None	1B.2	Chaparral, Lower montane coniferous forest, Upper montane coniferous forest/rocky, openings/ annual herb/ Apr-Jul/ 4,990-9,190	Not expected to occur. The site is between 565 and 830 feet AMSL, outside of the species' known elevation range.
Linanthus orcuttii	Orcutt's linanthus	None/ None	1B.3	Chaparral, Lower montane coniferous forest, Pinyon and juniper woodland/openings/ annual herb/ May-Jun/ 3,000-7,040	Not expected to occur. The site is between 565 and 830 feet AMSL, outside of the species' known elevation range.

Table 2
Special-Status Plant Species and Their Potential to Occur within Project Site

Scientific Name	Common Name	Status Federal/ State	CNPS	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Status Onsite or Potential to Occur
Lupinus peirsonii	Peirson's lupine	None/ None	1B.3	Joshua tree "woodland", Lower montane coniferous forest, Pinyon and juniper woodland, Upper montane coniferous forest/gravelly or rocky/ perennial herb/ Apr-Jun/ 3,280-8,200	Not expected to occur. No suitable Joshua tree woodland, coniferous forest, and/or Pinyon and juniper woodland occurs on site. Additionally, the site is between 565 and 830 feet AMSL, outside of the species' known elevation range.
Muhlenbergia californica	California muhly	None/ None	4.3	Chaparral, Coastal scrub, Lower montane coniferous forest, Meadows and seeps/mesic, seeps and stream banks/ perennial rhizomatous herb/ Jun-Sep/ 330-6,560	Low potential to occur. Although chaparral habitat occurs on site, this habitat is not mesic or within seeps and stream banks.
Nemacladus secundiflorus var. *robbinsii*	Robbins' nemacladus	None/ None	1B.2	Chaparral, Valley and foothill grassland/openings/ annual herb/ Apr-Jun/ 1148-5577	Not expected to occur. The site is between 565 and 830 feet AMSL, outside of the species' known elevation range.
Opuntia basilaris var. *brachyclada*	short-joint beavertail	None/ None	1B.2	Chaparral, Joshua tree "woodland", Mojavean desert scrub, Pinyon and juniper woodland/ perennial stem; succulent/ Apr-Jun/ 1,390-5,910	Not expected to occur. Although suitable chaparral habitat occurs on site, this species would have been observed if present. Additionally, the site is between 565 and 830 feet AMSL, outside of the species' known elevation range.
Oreonana vestita	woolly mountain-parsley	None/ None	1B.3	Lower montane coniferous forest, Subalpine coniferous forest, Upper montane coniferous forest/gravel or talus/ perennial herb/ May-Sep/ 5,300-11,480	Not expected to occur. No suitable coniferous forest habitat occurs on site. Additionally, the site is between 565 and 830 feet AMSL, outside of the species' known elevation range.

Table 2
Special-Status Plant Species and Their Potential to Occur within Project Site

Scientific Name	Common Name	Status Federal/ State	CNPS	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Status Onsite or Potential to Occur
Orobanche valida ssp. *valida*	Rock Creek broomrape	None/ None	1B.2	Chaparral, Pinyon and juniper woodland/granitic/ perennial herb parasitic/ May-Sep/ 4,100-6,560	Not expected to occur. Although suitable coastal sage - chaparral transition habitat is present on site, the site is between 565 and 830 feet AMSL, outside of the species' known elevation range.
Parnassia cirrata var. *cirrata*	San Bernardino grass-of-Parnassus	None/ None	1B.3	Lower montane coniferous forest, Meadows and seeps, Upper montane coniferous forest/mesic, streamsides, sometimes calcareous/ perennial herb/ Aug-Sep/ 4,100-8,005	Not expected to occur. No suitable mesic habitat occurs on site. Additionally, the site is between 565 and 830 feet AMSL, outside of the species' known elevation range.
Phacelia stellaris	Brand's star phacelia	FC/ None	1B.1	Coastal dunes, Coastal scrub/ annual herb/ Mar-Jun/ 3-1,310	Low potential to occur. Although suitable coastal sage - chaparral transition habitat present on site, this species was not observed during the site visit that occurred in March 2015.
Pseudognaphalium leucocephalum	white rabbit-tobacco	None/ None	2.2	Chaparral, Cismontane woodland, Coastal scrub, Riparian woodland/sandy, gravelly/ perennial herb/ (Jul)Aug-Nov(Dec)/ 0-6,890	Low potential to occur. Although suitable cismontane woodland and coastal sage - chaparral transition habitats occur within the project site, the site does not contain suitable sandy or gravelly soils preferred by this species.
Ribes divaricatum var. *parishii*	Parish's gooseberry	None/ None	1A	Riparian woodland/ deciduous shrub/ Feb-Apr/ 210-980	Not expected to occur. No suitable riparian habitat present within the project site. Additionally, this species would have been observed if present.

Table 2
Special-Status Plant Species and Their Potential to Occur within Project Site

Scientific Name	Common Name	Status Federal/ State	CNPS	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Status Onsite or Potential to Occur
Scutellaria bolanderi ssp. *austromontana*	southern mountains skullcap	None/ None	1B.2	Chaparral, Cismontane woodland, Lower montane coniferous forest/mesic/ rhizomatous herb/ Jun-Aug/ 1,390-6,560	Low potential to occur. Although suitable cismontane woodland and coastal sage - chaparral transition habitats occur on site, the habitat is not mesic. Additionally, the site is between 565 and 830 feet AMSL, outside of the species' known elevation range.
Senecio aphanactis	chaparral ragwort	None/ None	2.2	Chaparral, Cismontane woodland, Coastal scrub/sometimes alkaline/ annual herb/ Jan-Apr/ 50-2,625	Low potential to occur. Suitable cismontane woodland and coastal sage - chaparral transition habitats occurs within the project site. This species was not observed during the site visit in March, 2015.
Symphyotrichum defoliatum	San Bernardino aster	None/ None	1B.2	Cismontane woodland, Coastal scrub, Lower montane coniferous forest, Meadows and seeps, Marshes and swamps, Valley and foothill grassland (vernally mesic)/near ditches, streams, springs/ perennial rhizomatous herb/ Jul-Nov/ 10-6,690	Low potential to occur. Although cismontane woodland habitat occurs on site, this habitat is not mesic, thus not suitable to support this species.
Symphyotrichum greatae	Greata's aster	None/ None	1B.3	Broadleafed upland forest, Chaparral, Cismontane woodland, Lower montane coniferous forest, Riparian woodland/mesic/ perennial rhizomatous herb/ Jun-Oct/ 980-6,590	Low potential to occur. Although cismontane woodland and coastal sage - chaparral transition habitats occur on site, these habitats are not mesic, thus not suitable to support this species.
Thelypteris puberula var. *sonorensis*	Sonoran maiden fern	None/ None	2.2	Meadows and seeps(seeps and streams)/ perennial rhizomatous herb/ Jan-Sep/ 160-2,000	Not expected to occur. No suitable meadows and seeps present on site. Additionally, this species would have been observed if present.

Table 2
Special-Status Plant Species and Their Potential to Occur within Project Site

Scientific Name	Common Name	Status Federal/ State	CNPS	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Status Onsite or Potential to Occur
Viola pinetorum var. *grisea*	grey-leaved violet	None/ None	1B.3	Meadows and seeps, Subalpine coniferous forest, Upper montane coniferous forest/ perennial herb/ Apr-Jul/ 4921-11155	Not expected to occur. No suitable meadows and seeps or coniferous forest habitat present on site. Additionally, the site is between 565 and 830 feet AMSL, outside of the species' known elevation range.

Legend

FE: Federally listed as endangered
FT: Federally listed as threatened
FC: Federal Candidate for listing
SE: State listed as endangered
SR: State Rare
CRPR 1A: Plants presumed extinct in California
CRPR List 1B: Plants rare, threatened, or endangered in California and elsewhere
CRPR List 2: Plants rare, threatened, or endangered in California, but more common elsewhere
CRPR List 3: Plants about which more information is needed – a review list
CRPR List 4: Plants of limited distribution – a watch list
.1 Seriously endangered in California (over 80% of occurrences threatened/high degree and immediacy of threat)
.2 Fairly endangered in California (20% to 80% of occurrences threatened)
.3 Not very endangered in California (less than 20% of occurrences threatened or no current threats known).

4.3 Special-Status Wildlife Species

No USFWS-designated critical habitat for listed wildlife species exist within the project site (USFWS 2015). Suitable habitat was documented for special-status wildlife species.

Table 3 includes special-status wildlife species documented in the literature review and their potential to occur on site based on the location of the site and general vegetation communities found in the area. Eight special-status wildlife species, including coast (Blainville's) horned lizard (*Phrynosoma blainvillei*, CDFW Species of Species Concern [SSC]), coast range newt (*Taricha torosa*, SSC), Cooper's hawk (*Accipiter cooperii*, CDFW Watch List species [WL]), southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*, SSC), coastal California gnatcatcher (*Polioptila californica californica*, USFWS federally threatened [FT], SSC), western mastiff bat (*Eumops perotis californicus*, SSC), San Diego black-tailed jackrabbit (*Lepus californicus bennettii*, SSC), and big free-tailed bat (*Nyctinomops macrotis*, SSC) have been either documented in the near vicinity or suitable habitat exists. Additionally, pallid bat (*Antrozous pallidus*, SSC) has a potential to forage within the project site. Although the project site has a low potential to support coastal California gnatcatcher (FT, SSC) given the rarity of this species within the general project vicinity, the site is within this species historic range and the coastal sage – chaparral transition habitat and elevation within the project site is appropriate for this species. Thus, this species is discussed in greater detail below. No state-listed species has the potential to occur within the project site. These species are discussed in more detail following Table 3.

Table 3
Special-Status Wildlife and Their Potential to Occur within Project Site

Scientific Name	Common Name	Status Federal/ State/[1]	Primary Habitat Associations	Status Onsite Or Potential To Occur[2]
Amphibians and Reptiles				
Emys marmorata	Western pond turtle	None/ SSC	Slow-moving permanent or intermittent streams, ponds, small lakes, reservoirs with emergent basking sites; adjacent uplands used during winter	Not expected to occur. No suitable permanent or intermittent aquatic habitat present within the project site. Additionally, there is no CNDDB occurrence data for this species within the region (CDFW 2015).

Table 3
Special-Status Wildlife and Their Potential to Occur within Project Site

Scientific Name	Common Name	Status Federal/ State/[1]	Primary Habitat Associations	Status Onsite Or Potential To Occur[2]
Aspidoscelis tigris stejnegeri	Coastal whiptail	None/ None	Found in deserts and semiarid areas with sparse vegetation and open areas. Also found in woodland and riparian areas.	Moderate potential to occur. Suitable open and woodland areas occur within the project site. There is CNDDB occurrence data for this species approximately 1.5 miles south of the project site (CDFW 2015).
Anaxyrus californicus	Arroyo toad	FE/ SSC	Stream channels for breeding(typically 3rd order); adjacent stream terraces and uplands for foraging and wintering	Not expected to occur. No suitable aquatic habitats or adjacent stream terraces for breeding. Additionally, there is no CNDDB occurrence data for this species within the region (CDFW 2015).
Charina trivirgata	Rosy boa	None/ None	Desert and chaparral from the coast to the Mojave and Colorado deserts. Prefers moderate to dense vegetation and rocky cover.	Low potential to occur. Although coastal sage -chaparral transition habitat occurs on site, the habitat has limited chaparral vegetation and does not have rocky cover typically preferred by this species. Additionally, there is no CNDDB occurrence data for this species within the region (CDFW 2015).
Ensatina klauberi	Large-blotched salamander	None/ SSC	Conifer and woodland associations; in leaf litter, decaying logs and shrubs in heavily forested areas.	Low potential to occur. Although woodland habitats occur on site, these habitats were not moist during the site visit, conducted in March following a rain event. Additionally, there is no CNDDB occurrence data for this species within the region.
Phrynosoma blainvillei	Coast (Blainville's) horned lizard	None/ SSC	Coastal sage scrub, annual grassland, chaparral, oak and riparian woodland, coniferous forest.	Moderate potential to occur. Suitable annual grassland, coastal sage – chaparral transition, and oak woodland habitats present on site. There is CNDDB occurrence data for this species approximately 1.5 miles south of the project site (CDFW 2015).

Table 3
Special-Status Wildlife and Their Potential to Occur within Project Site

Scientific Name	Common Name	Status Federal/ State/[1]	Primary Habitat Associations	Status Onsite Or Potential To Occur[2]
Rana muscosa	Southern mountain yellow-legged frog	FE/ SE, SSC	Federal listing refers to populations in the San Gabriel, San Jacinto and San Bernardino Mountains only. Rocky streams in narrow canyons and in chaparral belts in the mountains of Southern California.	Not expected to occur. No suitable rocky streams within the project site. CNDDB occurrence data approximately 2 miles west of the project site is extirpated (CDFW 2015).
Taricha torosa (Monterey Co. south only)	Coast Range newt	None/ SSC	Wet forests, oak forests, chaparral, and rolling grasslands. Also known to use drier chaparral, oak woodland, and grasslands in southern California. Breeding is aquatic. Coastal drainages from Mendocino County to San Diego County.	Moderate potential to occur within upland habitats. Suitable coastal sage – chaparral transition, oak woodland and grassland upland habitats present; however, no suitable aquatic habitats for breeding. CNDDB occurrence data exists for this species within tributaries to the San Gabriel River approximately 2.3 miles northeast of the project site (CDFW 2015).
Thamnophis hammondii	Two-striped garter snake	None/ SSC	Streams, creeks, pools, streams with rocky beds, ponds, lakes, vernal pools. Coastal California from vicinity of Salinas to northwest Baja California from sea level to about 7,000 feet elevation.	Not expected to occur. No suitable aquatic habitat (e.g., streams, creeks, pools, ponds, lakes or vernal pools) present within the project site. The closest documented occurrence is within Fish Creek approximately 2.3 miles northeast of the project site (CDFW 2015).
Birds				
Accipiter cooperii (nesting)	Cooper's hawk	None/ WL	Riparian and oak woodlands, montane canyons	Moderate potential to occur. Suitable oak woodland habitat present on site. CNDDB records indicate species occurs within the region (CDFW 2015).

Table 3
Special-Status Wildlife and Their Potential to Occur within Project Site

Scientific Name	Common Name	Status Federal/ State/[1]	Primary Habitat Associations	Status Onsite Or Potential To Occur[2]
Aimophila ruficeps canescens	Southern California rufous-crowned sparrow	None/ WL	Grass-covered hillsides, coastal sage scrub, chaparral with boulders and outcrops	Moderate potential to occur. Although this species was not observed during the site visit in March 2015, suitable grassland and coastal sage – chaparral transition habitats are present on site. There is no CNDDB occurrence data for this species within the region (CDFW 2015).
Buteo swainsoni (nesting)	Swainson's hawk	BCC/ ST	Open grassland, shrublands, croplands	Not expected to nest. Low potential to forage. Although suitable grassland habitat is present on site, there is no CNDDB occurrence data for this species within the region (CDFW 2015). Additionally, the closest documented occurrence for this species is believed to be extirpated.
Coccyzus americanus occidentalis (nesting)	Western yellow-billed cuckoo	FT, BCC/ SE	Dense, wide riparian woodlands and forest with well-developed understories	Not expected to occur. No suitable riparian habitat occurs within the project site. CNDDB occurrence data for this species occurs approximately 4 miles southwest of the project site along the San Gabriel River (CDFW 2015).
Cypseloides niger (nesting)	Black swift	BCC/ SSC	Nests in moist crevices or caves on sea cliffs or near waterfalls in deep canyons; forages over many habitats	Not expected to nest, moderate potential to forage. No suitable crevices, caves, ledges, or waterfalls suitable for nesting. Species could occasionally forage within the project site. CNDDB occurrence data for this species is approximately 5.5 miles northwest of the project site within a waterfall in Santa Anita Canyon.

Table 3
Special-Status Wildlife and Their Potential to Occur within Project Site

Scientific Name	Common Name	Status Federal/ State/[1]	Primary Habitat Associations	Status Onsite Or Potential To Occur[2]
Empidonax traillii extimus (nesting)	Southwestern willow flycatcher	FE/ SE	Riparian woodlands along streams and rivers with mature, dense stands of willows or alders; may nest in thickets dominated by tamarisk	Low potential to occur. No suitable riparian habitat occurs within the project site. The closest documented CNDDB occurrence data for this species dates back to 1906 and is approximately 5.6 miles west of the project site (CDFW 2015).
Falco columbarius (wintering)	Merlin	None/ WL	Nests in open country, open coniferous forest, prairie; winters in open woodlands, grasslands, cultivated fields, marshes, estuaries and sea coasts	Low potential to occur. Although suitable open woodlands and grassland habitat occurs within the project site the closest documented CNDDB occurrence data for this species is approximately 10 miles southeast of the project site (CDFW 2015).
Icteria virens (nesting)	Yellow-breasted chat	DFG:SSC	Dense, relatively wide riparian woodlands and thickets of willows, vine tangles and dense brush.	Low potential to occur. No suitable riparian habitats occur within the project site. CNDDB occurrence data for this species approximately 1.5 miles south of the project site within mulefat scrub (CDFW 2015).
Polioptila californica californica	Coastal California gnatcatcher	FT/ SSC	Coastal sage scrub, coastal sage scrub-chaparral mix, coastal sage scrub-grassland ecotone, riparian in late summer	Low potential to occur. Although the potential for this species to occur in the project site is minimal given the rarity of the species in the area, the project site is within this species historic range and the coastal sage – chaparral transition habitat and elevation is appropriate for this species. This species was not detected during the site visit in March 2015. The closest CNDDB occurrence data for this species dates back to 1928 and has been extirpated by development within the region (CDFW 2015). The next closest documented extant occurrence is approximately 8 miles south of the project site in La Puente (CDFW 2015).

Table 3
Special-Status Wildlife and Their Potential to Occur within Project Site

Scientific Name	Common Name	Status Federal/ State/[1]	Primary Habitat Associations	Status Onsite Or Potential To Occur[2]
Riparia riparia (nesting)	Bank swallow	None/ ST	Riparian scrub and riparian woodland; Colonial nester; nests primarily in riparian and other lowland habitats west of the desert.	Not expected to occur. No suitable riparian habitat occurs within the project site. Additionally, there is no CNDDB occurrence data for this species approximately 2 miles southwest of the project site (CDFW 2015).
Vireo bellii pusillus (nesting)	Least Bell's vireo	FE/ SE	Nests in southern willow scrub with dense cover within 1-2 meters of the ground; habitat includes willows, cottonwoods, Baccharis spp., wild blackberry or mesquite on desert areas	Low potential to occur. No suitable riparian habitat present within the project site. There is CNDDB occurrence data within southern willow scrub habitat approximately 1.5 miles south of the project site for this species (CDFW 2015).
Mammals				
Antrozous pallidus	Pallid bat	None/ SSC	Rocky outcrops, cliffs, and crevices with access to open habitats for foraging	Low potential to roost. Moderate potential to forage. No suitable rocky outcrops, cliffs, and crevices for roosting occur within the project site. However, there is CNDDB occurrence data for this species within the region and open habitats suitable for foraging (CDFW 2015).
Corynorhinus townsendii	Townsend's big-eared bat	None/ SCT, SSC	Wide variety of habitats throughout California. Most common in mesic sites. Roosts in open areas, hanging from walls and ceilings, preferably in caves and mines	Low potential to occur. The site does not contain mesic habitats or suitable caves or mines for roosting. Additionally, there is no CNDDB occurrence data for this species within the region (CDFW 2015).
Eumops perotis californicus	Western mastiff bat	None/ SSC	Roosts in small colonies in cracks and small holes, seeming to prefer man-made structures	Moderate potential to occur. Man-made structures on site are suitable for roosting. There is CNDDB occurrence data for this species approximately 3 miles southeast of the project site (CDFW 2015)

Table 3
Special-Status Wildlife and Their Potential to Occur within Project Site

Scientific Name	Common Name	Status Federal/ State/[1]	Primary Habitat Associations	Status Onsite Or Potential To Occur[2]
Lasiurus cinereus	Hoary bat	None/ None	Prefers open habitats or habitat mosaics with access to trees for cover and open areas or habitat edges for feeding.	Moderate potential to occur. Suitable open and oak woodland habitat for foraging and roosting within the project site. CNDDB occurrence data for this species exists within 2.5 miles of the project site (CDFW 2015).
Lasiurus xanthinus	Western yellow bat	None/ SSC	Desert and montane riparian, desert succulent scrub, desert scrub, and pinyon-juniper woodland, extremely arid to dry areas. Often roosts in trees, generally hangs from the midrib of a leaf.	Low potential to occur. No suitable riparian, desert scrub or pinyon-juniper woodland habitat for foraging and roosting within the project site. CNDDB occurrence data for this species exists within 2.5 miles of the project site (CDFW 2015).
Lepus californicus bennettii	San Diego black-tailed jackrabbit	None/ SSC	Arid habitats with open ground; grasslands, coastal sage scrub, agriculture, disturbed areas, rangelands	Moderate potential to occur. Suitable open areas (i.e., annual grassland, coastal sage – chaparral transition, and disturbed areas) present within the project site. CNDDB occurrence data for this species occurs approximately 1.5 miles south of the project site (CDFW 2015).
Myotis thysanodes	Fringed myotis	None/ None	Prefers pinyon-juniper, valley foothill hardwood and hardwood-conifer woodlands from 4000 – 7000 feet. Forages in open habitats, early successional stages, streams, lakes, and ponds.	Not expected to occur. No suitable pinyon-juniper or conifer forests occur within the project site. The project site is between 565 feet and 830 feet above mean sea level (AMSL) well outside of the species' elevation range. Additionally, there is no CNDDB occurrence data for this species within the region (CDFW 2015).
Myotis volans	Long-legged myotis	None/ None	Feeds over open water and over open habitats, using denser woodlands and forests for cover and reproduction	Low potential to occur. Although suitable oak woodland habitat occurs on site, there is no suitable aquatic resource within the project site. Additionally, there is no CNDDB occurrence data for this species within the region (CDFW 2015).

Table 3
Special-Status Wildlife and Their Potential to Occur within Project Site

Scientific Name	Common Name	Status Federal/ State/[1]	Primary Habitat Associations	Status Onsite Or Potential To Occur[2]
Myotis yumanensis	Yuma myotis	None/ None	Closely tied to open water which is used for foraging; open forests and woodlands are optimal habitat.	Low potential to occur. No suitable aquatic resource occurs within the project site. Additionally, there is no CNDDB occurrence data for this species within the region (CDFW 2015).
Nyctinomops femorosaccus	Pocketed free-tailed bat	None/ SSC	Rocky desert areas with high cliffs or rock outcrops. Pinyon-juniper woodlands, desert scrub, desert succulent scrub, desert riparian, desert wash, alkali desert scrub, Joshua tree, and palm oasis.	Low potential to occur. No suitable desert habitats (i.e., pinyon-juniper woodland, desert scrub, or desert riparian) or rock crevices in cliffs present within the project site. There is CNDDB occurrence data for this species approximately 4.5 miles southeast of the project site (CDFW 2015).
Nyctinomops macrotis	Big free-tailed bat	None/ SSC	Rugged, rocky canyons. Roosts in buildings, caves, and sometimes in holes within trees.	Moderate potential to occur. Buildings suitable for roosting occur within the project site. Additionally, there is CNDDB occurrence data for this species approximately 2.5 miles east of the project site (CDFW 2015).
Ovis canadensis nelsoni	Desert bighorn sheep	None/ FP	Alpine, Alpine dwarf scrub, Chaparral, Chenopod scrub, Great Basin scrub, Mojavean desert scrub, Montane dwarf scrub, Pinon & juniper woodlands, Riparian woodland, Sonoran desert scrub.	Not expected to occur. Vegetation too dense for this species. Coastal sage – chaparral transition habitat present within the project site is limited for this species. Additionally, there in no CNDDB occurrence data for this species within the region (CDFW 2015).
Taxidea taxus	American badger	None/ SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils.	Low potential to occur. Although open annual grassland habitat occurs throughout the project site, suitable badger burrows were not identified during the site visit in March 2015. The closest CNDDB occurrence data for this species is approximately 2.5 miles southeast of the project site; however, this record has minimal information (CDFW 2015).

Table 3
Special-Status Wildlife and Their Potential to Occur within Project Site

Scientific Name	Common Name	Status Federal/ State/[1]	Primary Habitat Associations	Status Onsite Or Potential To Occur[2]
		Fish		
Catostomus santaanae	Santa Ana sucker	FT, TH/ SSC	Small, shallow, cool, clear streams less than 7 meters in width and a few centimeters to more than a meter in depth; substrates are generally coarse gravel, rubble and boulder	Not expected to occur. No suitable permanent streams present within the project site.
Gila orcutti	Arroyo chub	VU/ SSC	Warm, fluctuating streams with slow-moving or backwater sections of warm to cool streams at depths > 40 centimeters; substrates of sand or mud	Not expected to occur. No suitable permanent streams present within the project site.
Rhinichthys osculus ssp. 3	Santa Ana speckled dace	TH/ SSC	Permanent streams with cool, flowing rocky-bottomed washes, shallow cobble and gravel riffles	Not expected to occur. No suitable permanent streams present within the project site.

1 The listing status of species is based on the Special Animals List (March 2015), California Department of Fish and Wildlife.
2 Region is defined by a 5-mile radius from the edge of the project site.

Federal Designations:
BCC U. S. Fish & Wildlife Service Birds of Conservation Concern
FE Federally listed as Endangered
FT Federally listed as Threatened
FPE Federally proposed for listing as Endangered
FPT Federally proposed for listing as Threatened
FPD Federally proposed for delisting
FC Federal candidate species (former Category 1 candidates)
TH American Fisheries Society - Threatened
VU American Fisheries Society - Vulnerable

State Designations:
FP State Fully Protected
SE State-listed as Endangered
ST State-listed as Threatened
SCE State candidate for listing as Endangered
SCT State candidate for listing as Threatened
SCD State candidate for delisting
SSC State Species of Special Concern
WL State Watch List

4.4 Nesting Birds

The entire site provides suitable habitat for nesting birds. Although active nests were not identified during the site visit, suitable nesting habitat exists within the project site. Furthermore, the site visit was conducted early in the general nesting season and the site supported abundant bird activity. Thus, there is a high likelihood of birds nesting within the project site.

4.5 Jurisdictional Waters

Drainage naturally flows through two canyons dominated by coast live oak woodland from a north to south direction. The canyon within the central portion of the project site is referred to as Drainage A, while the canyon on the eastern boundary of the project site is Drainage B within this report. Both Drainages (A and B) were dry during the survey, which was conducted two days following a rain event in the area. Additionally, there was no hydrophytic vegetation associated with the project site; thus, these canyons are ephemeral, probably facilitating run off flow to the project site and/or concrete wash south of the project site during rain events. There are no documented streams or drainages leading into the project site. The San Gabriel River is approximately 1.5 miles east of the site. All drainage north of the site most likely gets funneled into the Spinks Drainage Debris Basin, which is owned, managed and maintained by the Los Angeles County Flood Control District.

Generally, non-wetland waters of the United States are delineated based on the presence of an ordinary high water mark (OHWM). All surface flows are waters of the state and are delineated at the OHWM, at outer limits of hydrophytic vegetation, or at the outer rim of depressional features, if relevant. In accordance with the California Fish and Game Code, streambeds are determined based on the presence of a definable bed and bank and are delineated from top of bank to top of bank or the extent of associated riparian vegetation.

Ephemeral Drainage A

Drainage A is ephemeral and generally flows north to south. This drainage appears to originate approximately 0.5 mile north of the project site, immediately north of El Cielo Lane. The OHWM is not well defined but exhibits some scouring, exposed roots, and drift deposits. Additionally, there is no well defined bed and bank. Drainage A does not support hydrophytic vegetation in or adjacent to the channel. The feature is dominated by coast live oak trees, as well as a dense cover of non-native grasses and forbs including bromes, wild oat, black mustard, London rocket, stinging nettle and castorbean.

Within the downstream portion of this feature is an approximately 3-foot tall retaining wall located north of the residence in the center of the project site. This retaining wall appears to channel water away from the house, into an underground culvert approximately 20 feet northeast of the residence. This underground culvert most likely leads to the concrete wash located approximately 15 feet south of the project boundary. Drainage A most likely has connectivity to waters of the United States; therefore, may be under the jurisdiction of the ACOE, RWQCB, and/or CDFW. A jurisdictional delineation is recommended to determine whether this feature has hydrologic connectivity to any traditional navigable waters of the United States. If this feature is found to connect to waters of the United States it may fall under the jurisdiction of the ACOE, RWQCB, and/or CDFW.

Ephemeral Drainage B

Drainage B is also ephemeral and flows north to south. This drainage originates approximately 70 feet north of the project site at a residence south of El Cielo Lane and approximately 550 feet east of Bradbury Hills Lane. This drainage is less steep compared with Drainage A and the OHWM is not well defined, but exhibits some scouring and drift deposits. Additionally, there is no definable bed and bank. Drainage B is also dominated by coast live oak trees, as well as dense cover of non-native grasses and forbs including bromes, wild oats, black mustard, shortpod mustard, London rocket and stinging nettle. No hydrophytic vegetation was observed within or adjacent to Drainage B.

The downstream portion of the feature is less defined appearing to disseminate into the non-native grassland area along the southeastern portion of the project site. There was no obvious drainage outlet; however, the drainage could lead into the concrete wash located approximately 15 feet south of the project boundary. A jurisdictional delineation is recommended to determine whether this feature has hydrologic connectivity to any traditional navigable waters of the United States. If this feature is found to connect to waters of the United States it may fall under the jurisdiction of the ACOE, RWQCB, and/or CDFW.

5 IMPACTS AND RECOMMENDATIONS

Vegetation Communities

According to Holland (1986), the project site does not support any sensitive vegetation communities. Thus, development of the site will not result in significant impacts to vegetation communities. There are a number of coast live oak trees, as well as other City protected trees, present within the project site which is protected under Chapter 9.06.090 of the City's Municipal Code. A tree removal permit, including appropriate mitigation, would be required prior to removal of these trees.

Special-Status Plants

No special-status plant species were observed on the project site during the site visit. Two special-status plant species have a moderate potential to occur within the chaparral and/or coast live oak woodland communities on site: Plummer's mariposa lily (CRPR 1B.2) and Robinson's pepper-grass (CRPR 1B.2). Development of the site may result in significant impacts to special-status plants, if identified within the project site. Focused special-status plant surveys are recommended at the appropriate time to capture the characteristics necessary to identify the taxon. Surveys should be conducted consistent with CNPS protocols and by a qualified botanist knowledgeable of the local flora. If special-status plants are observed during focused surveys, appropriate mitigation may be required.

Special-Status Wildlife

There were no special-status wildlife species detected within the project site; however, there is potential to support coast (Blainville's) horned lizard (SSC), coast range newt (SSC), nesting Cooper's hawk (WL), southern California rufous-crowned sparrow (SSC), western mastiff bat (SSC), San Diego black-tailed jackrabbit (SSC), and big free-tailed bat (SSC). Additionally, pallid bat (*Antrozous pallidus*, SSC) has a moderate potential to forage within the project site; however, impacts to foraging habitat along the southern half of the project would not likely be significant. These are all sensitive species. No federally- or state-listed species have moderate or better potential to occur within the project site. While habitat is marginal for the federally-listed California gnatcatcher (*Polioptila californica*), the site does lie within it geographic and elevation range and sage scrub communities exist. Since the community is very poor (5% shrub cover), it is suggested that dialog occur with the USFWS to verify that additional focused surveys are not required. If special-status wildlife species are observed during focused surveys, appropriate mitigation may be required.

Nesting Birds

The entire project site provides suitable habitat for nesting birds. Direct impacts to migratory birds must be avoided in accordance with the Migratory Bird Treaty Act and California Fish and Game Codes 3503 and 3503.5. If ground-disturbance and/or vegetation removal activities occur during the avian nesting season (February 1 through August 31), preconstruction survey and avoidance measures, if nesting birds (active nests as separately defined by each agency) are present, must be conducted.

Jurisdictional Waters

There are two potentially jurisdictional drainages (Drainages A and B) that facilitate the flow of water from north to south through the project site. These drainages support coast live oak woodland communities, as well as non-native grassland vegetation, and occur along the central and eastern boundaries of the site. Both of these drainages were dry during the site visit which occurred two days following a rain event in the area and did not exhibit hydrophytic vegetation; however, Drainage A leads to an underground culvert toward the center of the project site, which most likely leads to the concrete wash south of the site; and Drainage B should be examined more closely to determine hydrologic connectivity with any traditional navigable waters of the United States. Therefore Drainages A and B may be under the jurisdiction of USACE, RWQCB, and/or CDFW. If impacts to these drainages are anticipated to occur, then a jurisdictional delineation is recommended. Appropriate permits and mitigation are required prior to impacts to USACE, RWQCB, and/or CDFW jurisdictional waters.

6 CONCLUSIONS

The following additional surveys are recommended for compliance with the California Environmental Quality Act (CEQA), federal and State Endangered Species Acts, local plans, and other regulatory requirements:

1. **CEQA Compliance**:
    a. *Special-Status Focused Plant Surveys*: The chaparral and/or coast live oak woodland habitats on site have the potential to support special-status plant species. Focused special-status plant surveys are recommended for Plummer's mariposa lily and Robinson's pepper-grass and should be conducted during the blooming season (May–July and January–July, respectively).

    b. *Special-Status Wildlife Surveys*: Although special-status wildlife species were not identified during the site visit, the project site provides suitable habitat to support coast (Blainville's) horned lizard (SSC), coast range newt (SSC), nesting Cooper's hawk (WL), southern California rufous-crowned sparrow (SSC), coastal California gnatcatcher (FT, SSC), western mastiff bat (SSC), San Diego black-tailed jackrabbit (SSC), and big free-tailed bat (SSC), as well as a number of foraging species.

        i. Bats: Any abandoned buildings within the project site should be examined for bat roosts and sign (i.e., guano). If sign is observed a bat detection survey may be required to determine species and additional avoidance and minimization measures, if required.

        ii. Coastal California Gnatcatcher: Consultation with USFWS is recommended to determine whether protocol-level surveys for coastal California gnatcatcher would be required for the project site. If it is determined that coastal California gnatcatcher surveys are required, then surveys must be conducted in accordance with the currently accepted USFWS protocol (USFWS 1997). If protocol-level surveys are negative, no additional mitigation is required. If protocol-level surveys are positive, consultation with USFWS shall occur and/or an incidental take permit (ITP), including appropriate mitigation, shall be obtained from the USFWS.

        iii. Special-Status Wildlife Species: The habitats within the project site are suitable to support special-status wildlife species. Therefore, it is recommended that a presence/absence pre-construction survey be conducted and avoidance and minimization measures be implemented prior to construction.

c. *Nesting Bird Surveys*: The entire project site provides suitable habitat for nesting birds. Direct impacts to migratory birds must be avoided in accordance with the Migratory Bird Treaty Act and California Fish and Game Codes. If ground-disturbance and/or vegetation removal activities occur during the avian nesting season (February 1 through August 31), preconstruction surveys must be conducted and avoidance measures implemented, if nesting birds are present.

2. **Jurisdictional Waters**: A delineation of jurisdictional waters should be conducted to confirm the presence/absence of jurisdictional waters within the project site. State and/or federal permits, including appropriate mitigation, would be required prior to impacting jurisdictional waters, if present.

3. **City of Bradbury Tree Preservation**: The native oak trees and other City protected trees present within the project site are protected trees under the Chapter 9.06.090 of the City's Municipal Code. A tree removal permit, including appropriate mitigation, would be required prior to removal of these trees. Submittal of a Tree Preservation and Landscaping Plan is required as part of the architectural review by the City prior to removal of any protected trees.

Should you have any questions regarding this biological assessment, please do not hesitate to contact me at 626.204.9824 or at jpage@dudek.com.

Sincerely,

Johanna Page
Biologist

Att.: A: Figures 1-4
B: Photo Documentation
C: Plant Compendium
D: Wildlife Compendium

cc: Ruta Thomas
Brock Ortega

7 REFERENCES

ACOE (U.S. Army Corps of Engineers). 1987. *Wetland Delineation Manual.* https://www.fedcenter.gov/_kd/go.cfm?destination=ShowItem&Item_ID=6403

ACOE. 2008a. *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States.* ERDC/CRREL TR-08-12. Hanover, New Hampshire: U.S. Army Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory.

ACOE. 2008b. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0).* Environmental Laboratory, ERDC/EL TR-08-28. Vicksburg, Mississippi: U.S. Army Engineer Research and Development Center. September 2008. http://el.erdc.usace.army.mil/elpubs/pdf/trel08-28.pdf.

AOU (American Ornithologists' Union). 2012. "AOU Checklist of North and Middle American Birds." 'American Ornithologists' Union website. Accessed March 2015. http://checklist.aou.org/taxa/.

Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken, eds. 2012. *The Jepson Manual: Vascular Plants of California.* 2nd ed. Berkeley, California: University of California Press.

CDFW (California Department of Fish and Wildlife). 2015. California Natural Diversity Database (CNDDB). RareFind 4.0 (Commercial Subscription). Sacramento, California: CDFW, Biogeographic Data Branch. Accessed March 2015. https://nrmsecure.dfg.ca.gov/cnddb/Default.aspx.

City of Bradbury. 2007. Tree Preservation and Protection. Site Planning and General Development Code, Chapter 9.06.090. Ordinance of 2007. City of Bradbury Development Code – Ordinance No. 297. City of Bradbury Development Standards, Title 9.06, "Trees." March 20, 2007. Accessed online March 2015. http://file.lacounty.gov/acwm/cms1_216005.pdf.

City of Bradbury. 2014. General Plan 2012-2030 Update Community Resources Element (Open-Space and Conservation Elements) Conservation Element. *General Plan 2012-20130 Update, Revised 020514*. http://www.cityofbradbury.org/images/Community_Resources_Element.pdf.

CNPS (California Native Plant Society). 2015. Inventory of Rare and Endangered Plants (online edition, v8-02). Sacramento, California: California Native Plant Society. Accessed March 2015. www.rareplants.cnps.org.

County of Los Angeles. 2011. "Soil Types" [GIS Data for LA County]. Los Angeles County GIS Data Portal. http://egis3.lacounty.gov/dataportal/2011/01/27/soil-types/.

Crother, B.I. 2012. *Scientific and Standard English Names of Amphibians and Reptiles of North America North of Mexico, with Comments Regarding Confidence in our Understanding,* edited by J.J. Moriarty. 7th ed. Society for the Study of Amphibians and Reptiles (SSAR); Herpetological Circular, no. 39. August 2012. Accessed March 10, 2015. http://home.gwu.edu/~rpyron/publications/Crother_et_al_2012.pdf.

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

Jepson Flora Project. 2015. Jepson eFlora. Berkeley, California: University of California. Accessed March 2015. http://ucjeps.berkeley.edu/cgi-bin/get_JM_name_data.pl.

NABA (North American Butterfly Association). 2001. "Checklist of North American Butterflies Occurring North of Mexico." Adapted from North American Butterfly Association (NABA) Checklist & English Names of North American Butterflies, eds. B. Cassie, J. Glassberg, A. Swengel, and G. Tudor. 2nd ed. Morristown, New Jersey: NABA. Accessed March 2014. http://www.naba.org/pubs/enames2.html.

NRCS (Natural Resources Conservation Service). 2015. Web Soil Survey. U.S. Department of Agriculture, NRCS. Accessed March2015. http://websoilsurvey.nrcs.usda.gov.

Oberbauer, T., M. Kelly, and J. Buegge. 2008. *Draft Vegetation Communities of San Diego County.* March 2008. Accessed March 10, 2015. http://www.sdcanyonlands.org/canyon-groups/canyon-group-resources/canyon-enhancement-guide/189-canyon-enhancement-planning-guide-materials.

USDA (U.S. Department of Agriculture). 2015. "California." State PLANTS Checklist. Accessed March 2015. http://plants.usda.gov/dl_state.html.

USFWS (U.S. Fish and Wildlife Service). 1997. Coastal California Gnatcatcher (Polioptila californica californica) Presence/Absence Survey Guidelines. Carlsbad, California. February 28, 1997.

USFWS. 2015a. "Critical Habitat and Occurrence Data." *Geospatial Services*. Accessed January 2014. http://www.fws.gov/data.

USFWS. 2015b. National Wetlands Inventory. Accessed March 2015. http://www.fws.gov/wetlands/Data/Mapper.html.

USGS (U.S. Geological Survey). 1973. [USGS 7.5-minute topographic quadrangles were reviewed for potential habitat and jurisdictional resources—7.5-minute Azusa quadrangle map, Township 1 North, Range 10 West, and Section 30].

Wilson, D.E., and D.M. Reeder, eds. 2005. Mammal Species of the World: A Taxonomic and Geographic Reference. 3rd ed. Baltimore, Maryland: Johns Hopkins University Press.

Zeiner, D.C., W.F. Laudenslayer Jr., K.E. Mayer, and M. White, eds. 1990. *California's Wildlife: Volume III. Mammals*. Sacramento, California: California Department of Fish and Game.

ATTACHMENT A

Figures 1-4

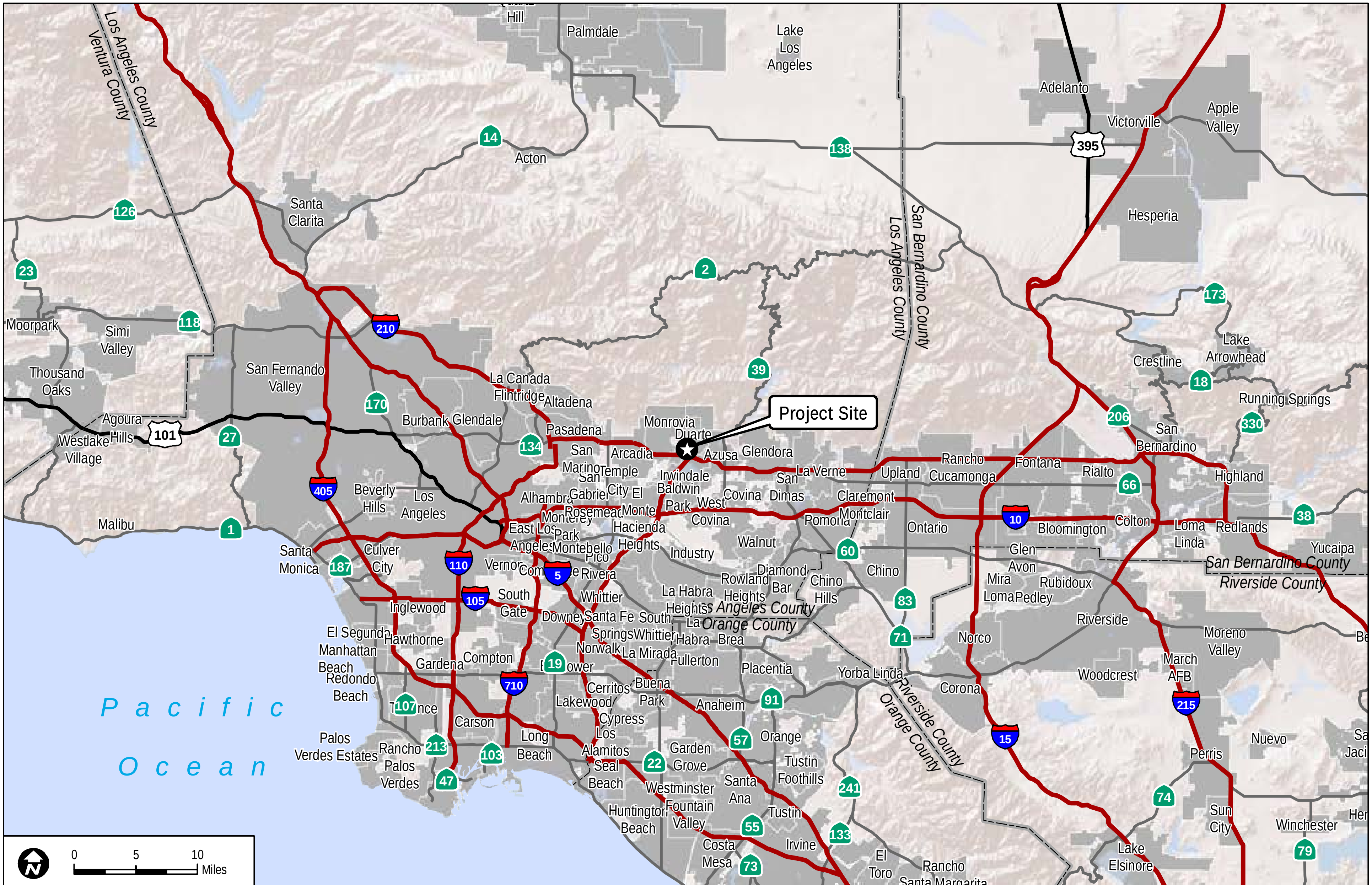

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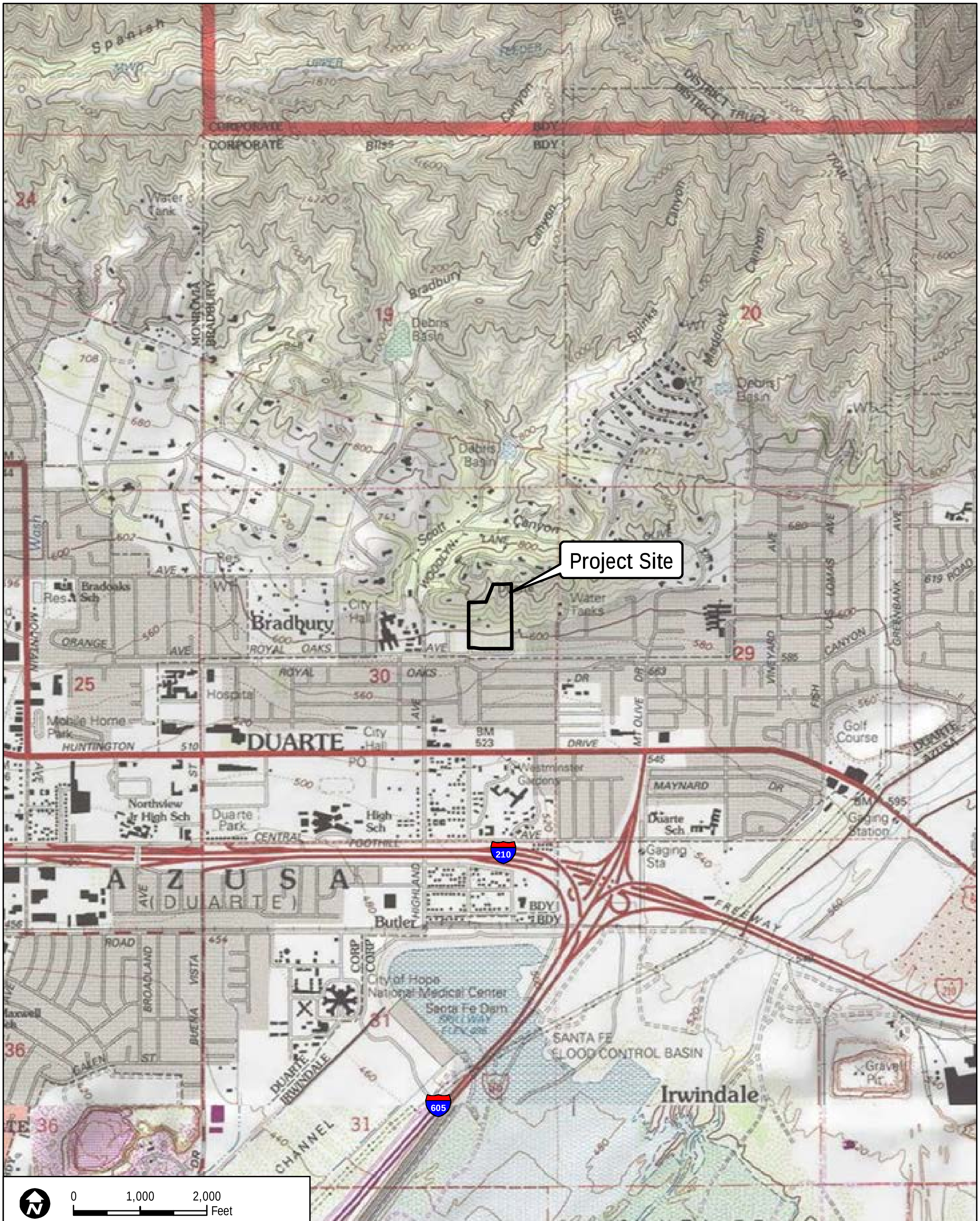
FIGURE 1

Regional Map

Royal Oaks Project



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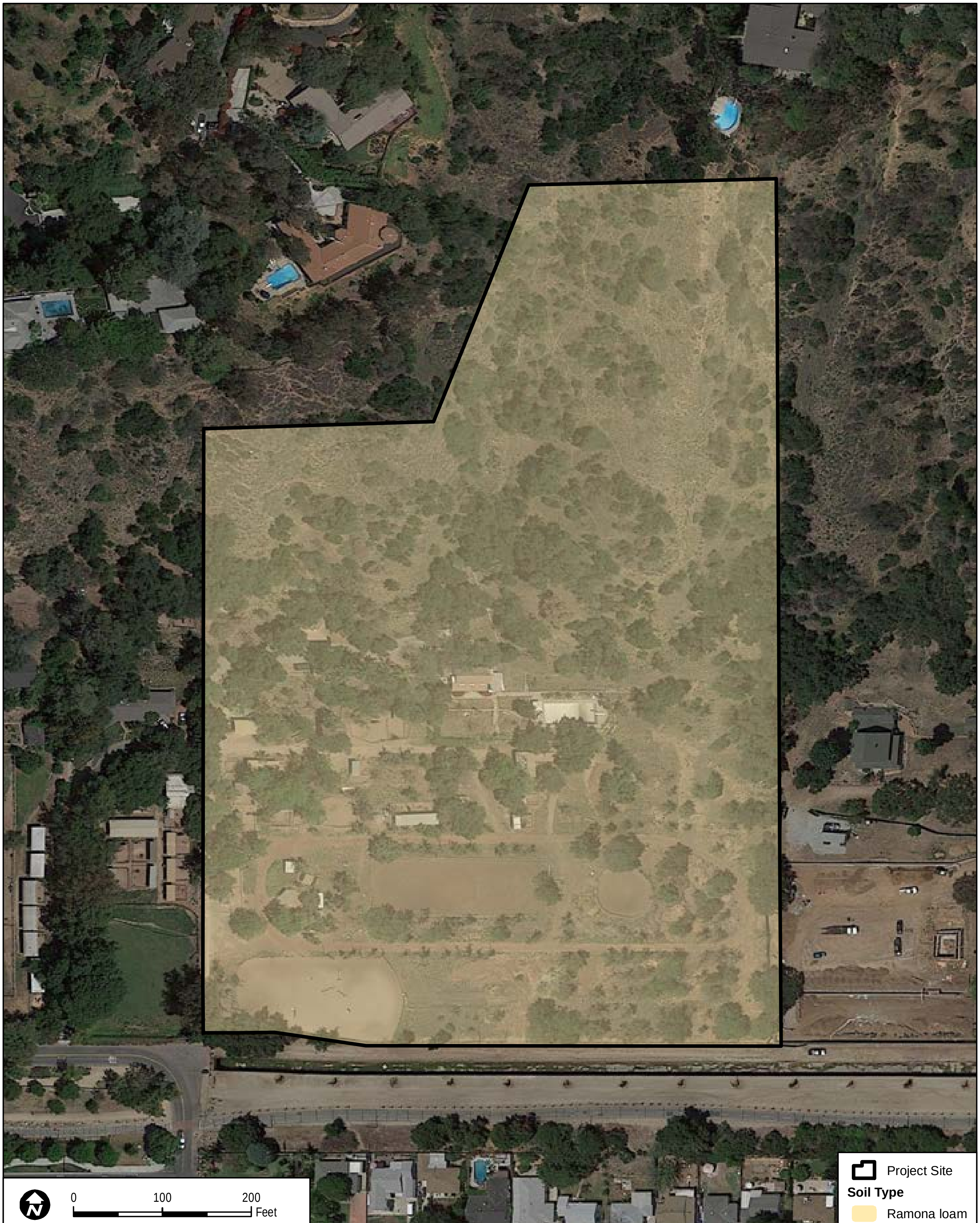
SOURCE: USGS 7.5-Minute Series Azusa Quadrangle.

FIGURE 2
Vicinity Map

Royal Oaks Project



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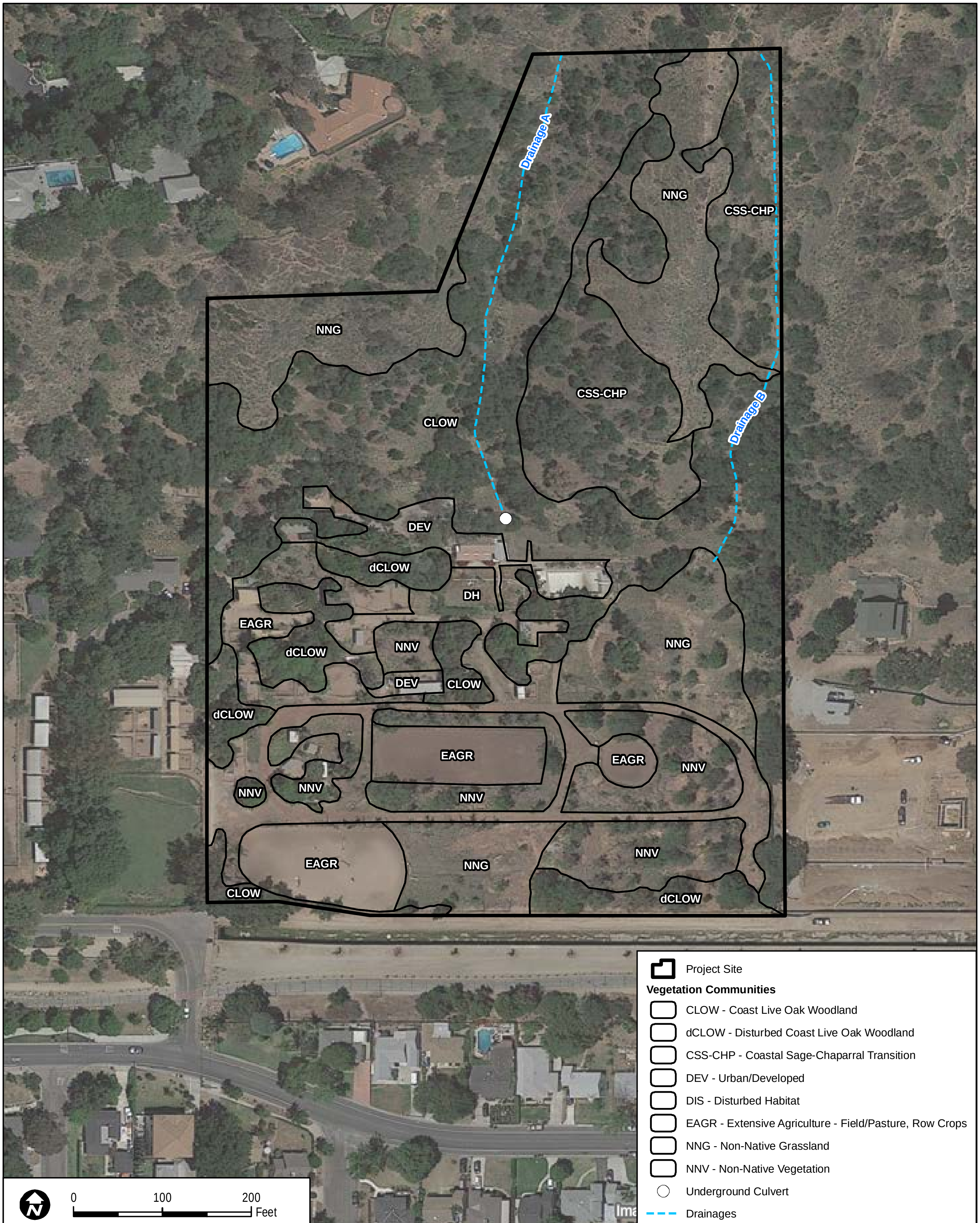
SOURCE: Google Maps

FIGURE 3
Soils Map

Royal Oaks Project



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SOURCE: Google Maps

FIGURE 4

Biological Resources

Royal Oaks Project

ATTACHMENT B

Photo Documentation

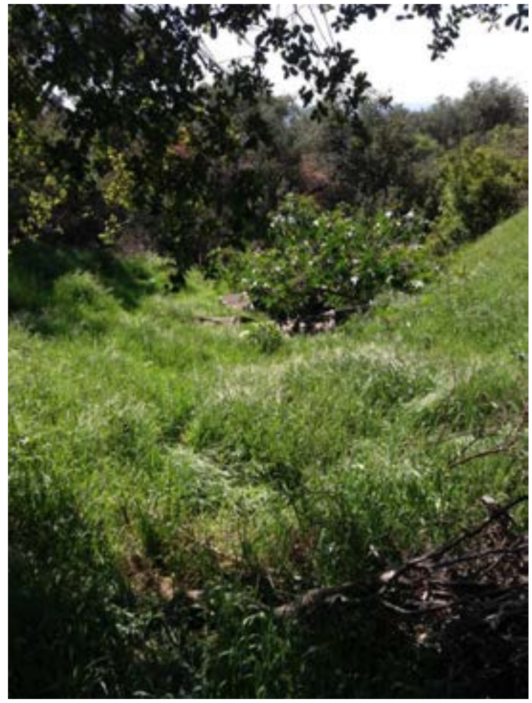
ATTACHMENT B – Royal Oaks Project Site Photo Documentation

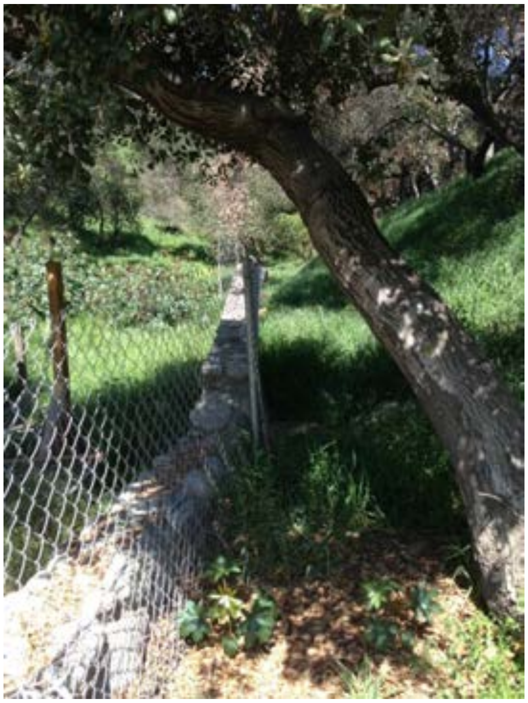
	
Paved driveway and smaller house to the west of the main residence along the central portion of site; photo facing east.	Horse corral and boarding area along the southwestern portion of the site; photo facing west.
	
Shed along the central western portion of the site; photo facing north	Citrus tree with acorn granaries utilized by an acorn woodpecker; photo facing west.

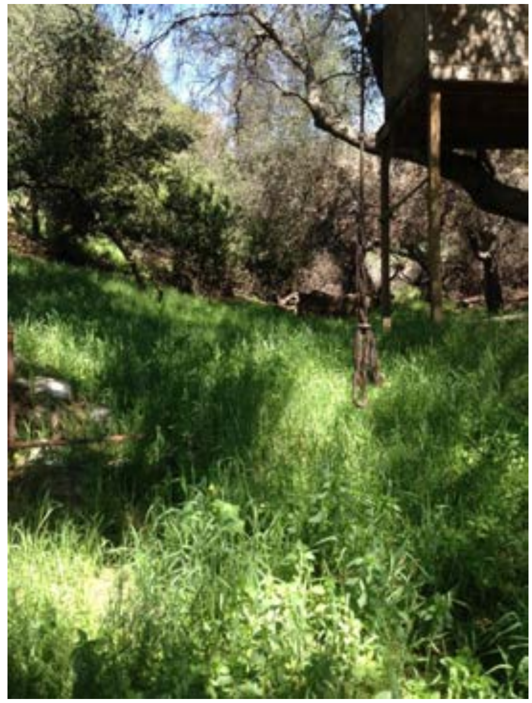
ATTACHMENT B – Royal Oaks Project Site Photo Documentation

	
Non-native grassland along the central eastern portion of the project site; photo facing south.	Non-native grassland along the central eastern portion of the project site; photo facing southwest.
	
Non-native grassland along the northern portion of the project site; photo facing north.	Coastal sage – chaparral habitat along the northern portion of the project site; photo facing southwest.

	
Coastal sage – chaparral habitat along northern portion of project site; photo facing northwest.	Coastal sage – chaparral habitat along northern portion of project site; photo facing northwest.
	
Oak woodland habitat north of the main residence; photo facing northeast.	Oak woodland habitat along northern portion of the site west of a building; photo facing north.

	
Upstream portion of Drainage A, canyon dominated by coast live oak woodland; facing north.	Central portion of Drainage A; photo facing south.
	
Central portion of Drainage A; facing south.	Drainage A, north of residence; facing north.

	
Retaining wall north of residence, guides water associated with Drainage A; photo facing south.	Drainage A, south of underground culvert and east of residence; photo facing north.
	
Culvert directs runoff along Drainage A underground to the south; photo facing south.	Concrete wash approximately 15 feet south of the project site; photo facing north.

	
Drainage B and retention wall along the eastern portion of the site; photo facing northeast.	Photo facing north towards Drainage B, within the northern portion of the project site.
	
Photo facing north toward Drainage B located along the eastern portion of the project site.	Concrete wash 15 feet south of the project site; photo facing northeast towards the eastern portion of the project.

ATTACHMENT C

Plant Compendium

APPENDIX C
Plant Compendium

VASCULAR SPECIES

MONOCOTS

POACEAE—GRASS FAMILY

Avena fatua—wild oat
Bromus diandrus—ripgut brome
Bromus madritensis ssp. *rubens*—red brome

THEMIDACEAE—BRODIAEA FAMILY

Dichelostemma capitatum—bluedicks

EUDICOTS

ADOXACEAE—MUSKROOT FAMILY

Sambucus nigra ssp. *caerulea*—blue elderberry

ANACARDIACEAE—SUMAC OR CASHEW FAMILY

Malosma laurina—laurel sumac
Rhus integrifolia—lemonade sumac
Schinus molle—Peruvian peppertree

APOCYNACEAE—DOGBANE FAMILY

Funastrum cynanchoides var. *hartwegii*—Hartweg's twinevine

ASTERACEAE—SUNFLOWER FAMILY

Ambrosia dumosa—burrobush
Artemisia californica—coastal sagebrush
Silybum marianum—blessed milkthistle

BRASSICACEAE—MUSTARD FAMILY

Brassica nigra—black mustard
Hirschfeldia incana—shortpod mustard
Sisymbrium irio—London rocket

CACTACEAE—CACTUS FAMILY

Opuntia littoralis—coastal pricklypear
Opuntia ficus-indica—Barbary fig

CHENOPODIACEAE—GOOSEFOOT FAMILY

Salsola tragus—prickly Russian thistle

CUCURBITACEAE—GOURD FAMILY

Marah macrocarpa—Cucamonga manroot

EUPHORBIACEAE—SPURGE FAMILY

Ricinus communis—castorbean

FAGACEAE—OAK FAMILY

Quercus agrifolia—coastal live oak

GERANIACEAE—GERANIUM FAMILY

Erodium cicutarium—redstem stork's bill

MORACEAE—MULBERRY FAMILY

Ficus carica—edible fig

MYRTACEAE—MYRTLE FAMILY

Eucalyptus spp.—eucalyptus spp.

PROTEACEAE—PROTEA FAMILY

Grevillea robusta—silkoak

ROSACEAE—ROSE FAMILY

Adenostoma fasciculatum—chamise
Cercocarpus betuloides—birchleaf mountain mahogany

RUTACEAE—RUE FAMILY

Citrus spp.—citrus spp.

SOLANACEAE—NIGHTSHADE FAMILY

Nicotiana glauca—tree tobacco

ULMACEAE—ELM FAMILY

Ulmus sp.—elm sp.

URTICACEAE—NETTLE FAMILY

Urtica dioica—stinging nettle

MAGNOLIIDS

LAURACEAE—LAUREL FAMILY

Persea americana—avocado

ATTACHMENT D

Wildlife Compendium

APPENDIX D
Wildlife Compendium

BIRD

EMBERIZINES

EMBERIZIDAE—EMBERIZIDS

Melozone crissalis—California towhee
Junco hyemalis—dark-eyed junco

FINCHES

FRINGILLIDAE—FRINGILLINE AND CARDUELINE FINCHES AND ALLIES

Carpodacus mexicanus—house finch

FLYCATCHERS

TYRANNIDAE—TYRANT FLYCATCHERS

Sayornis nigricans—black phoebe

HAWKS

ACCIPITRIDAE—HAWKS, KITES, EAGLES, AND ALLIES

Buteo jamaicensis—red-tailed hawk

HUMMINGBIRDS

TROCHILIDAE—HUMMINGBIRDS

Calypte anna—Anna's hummingbird

JAYS, MAGPIES AND CROWS

CORVIDAE—CROWS AND JAYS

Aphelocoma californica—western scrub-jay
Corvus brachyrhynchos—American crow
Corvus corax—common raven

NEW WORLD VULTURES

CATHARTIDAE—CARDINALS AND ALLIES

Cathartes aura—turkey vulture

PIGEONS AND DOVES

COLUMBIDAE—PIGEONS AND DOVES

Zenaida macroura—mourning dove

STARLINGS AND ALLIES

STURNIDAE—STARLINGS

* *Sturnus vulgaris*—European starling

TITMICE

PARIDAE—CHICKADEES AND TITMICE

Baeolophus inornatus—oak titmouse

WOODPECKERS

PICIDAE—WOODPECKERS AND ALLIES

Melanerpes formicivorus—Acorn woodpecker
Picoides pubescens—downy woodpecker

WRENTITS

TIMALIIDAE—BABBLERS

Chamaea fasciata—wrentit

MAMMAL

SQUIRRELS

SCIURIDAE—SQUIRRELS

Spermophilus (Otospermophilus) beecheyi—California ground squirrel

UNGULATES

CERVIDAE—DEERS

Odocoileus hemionus—mule deer

REPTILE

LIZARDS

PHRYNOSOMATIDAE—IGUANID LIZARDS

Sceloporus occidentalis—western fence lizard
Uta stanburiana—common side-blotched lizard

* signifies introduced (non-native) species

Biological Assessments

Tree Preservation and Protection Plan

Royal Oaks Project
(APN: 8527-021-041)
Tree Preservation and Protection Plan

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TABLE OF CONTENTS

APPENDICES

TABLE OF CONTENTS (CONTINUED)

Page No.

FIGURES

TABLES

1 INTRODUCTION

Dudek evaluated and recorded information about regulated trees classified as native, prominent, significant, and orchard trees over 4 inches in diameter at 24 inches above finished grade and prepared this Tree Preservation and Protection Plan (TPPP) for the proposed Royal Oaks Project (project) in the City of Bradbury, California. Primary topics of this TPPP include evaluations of project-related impacts and recommendations for tree protection, relocation, removal, and mitigation. The project site is located on private land, in the City of Bradbury, approximately 1.3 miles south of the Angeles National Forest.

This TPPP provides a summary of Dudek's site and tree evaluation within the proposed development and infrastructure improvement areas. There are seven native tree species that meet the City's definition of a native tree, including Arizona ash (*Fraxinus velutina)*, coast live oak (*Quercus agrifolia)*, Engelmann oak (*Quercus engelmannii)*, western cottonwood (*Populus fremontii*), toyon (*Heteromeles arbutifolia*), sumac (*Rhus ovata*), and Mexican elderberry (*Sambucus mexicana*). Of the seven native species found on site, coast live oak is the most prominent. Non-native trees found on site include king palm (*Archontophoenix alexadrae*), flame tree (*Brachychiton acerfolius*), carob (*Ceratonia siliqua*), lime (*Citrus aurantifola*), lemon (*Citrus x limon*), blue gum eucalyptus (*Eucalyptus globulus*), edible fig (*Ficus edulis*), Shamel ash (*Fraxinus uhdei*), silk oak (*Grevillea robusta*), Chinese flame tree (*Koelreuteria bipinnata*), white mulberry (*Malus alba*), avocado (*Persea Americana*), stone pine (*Pinus pinea*), prunus (*Prunus* spp.), cork oak (*Quercus suber*), Brazilian pepper (*Schinus terebinthifolius*), tipu (*Tipuana tipu*), Chinese elm (*Ulmus parvifolia*), and one unknown dead tree.

Dudek's International Society of Arboriculture (ISA) certified arborists performed various tasks associated with surveying, inventorying, and evaluating the condition of the property's trees, as described in the following sections. The purpose of this TPPP is to present the physical characteristics, mapped locations, impact and preservation totals, and appropriate mitigation for impacts to native and other protected trees. The tree quantities and related project impacts have been analyzed and are reported in the following sections.

In summary, the Royal Oaks property exhibits an orchard like setting, with non-native trees and scattered oaks on the southern portion of the property and scattered individual coast live oak trees throughout the northern portion. In summary, there are 465 protected trees located throughout the project site 234 that are native (50.3%) and 231 that are non-native (49.7%). Of these, 154 trees (33.1% of the trees on the project site) are expected to be impacted by the proposed project and associated infrastructure improvements. Of the impacted protected trees, 13 trees are considered "candidates" for relocation. However, tree relocation is not a requirement of the City or of this TPPP. Should the project applicant determine that relocating trees would be desirable, the candidate trees could be considered appropriate, upon closer examination.

1.1 Site Description

The approximately 12.4-acre project site is located northeast of the intersection of Royal Oaks Drive and Royal Oaks Drive North, north of Interstate 210 (I-210) and west of Interstate 605 (I-605), within the City of Bradbury, Los Angeles County, California (Figure 1; all figures are provided in Attachment A). It is comprised of Assessor's Parcel Number (APN) 8527-021-041, situated in Section 30 of Township 1 North Range 10 West of the Azusa 7.5-minute U.S. Geological Survey (USGS) quadrangle (Figure 2). The project site is located on private land approximately 1.3 miles south of the Angeles National Forest.

The topography within the project site creates a natural divide between the southern and northern portions of the property. Two unoccupied residential homes are located in the central portion of the property. The southern half of the project site is disturbed, dominated by numerous horse corrals and horse boarding areas, dirt roads, buildings, and avocado orchards. Numerous small buildings exist throughout the southern half of the project site. The vegetation within the southern portion of the site is dominated by non-native grassland, non-native vegetation, and disturbed and non-disturbed oak woodland. The northern portion of the project site is undeveloped and comprised of natural vegetation dominated by coast live oak woodlands along the canyons.

1.2 Project Description

The site is approximately 12-acres (APN 8527-021-041) located off Royal Oaks drive in Bradbury, California. The proposed Royal Oaks Project would establish a specific plan to create a new private gated subdivision consisting of eight custom residential home sites and a small security gatehouse. Demolition of an existing residence, pool, carport, garage and apartment, and horse stables is also proposed.

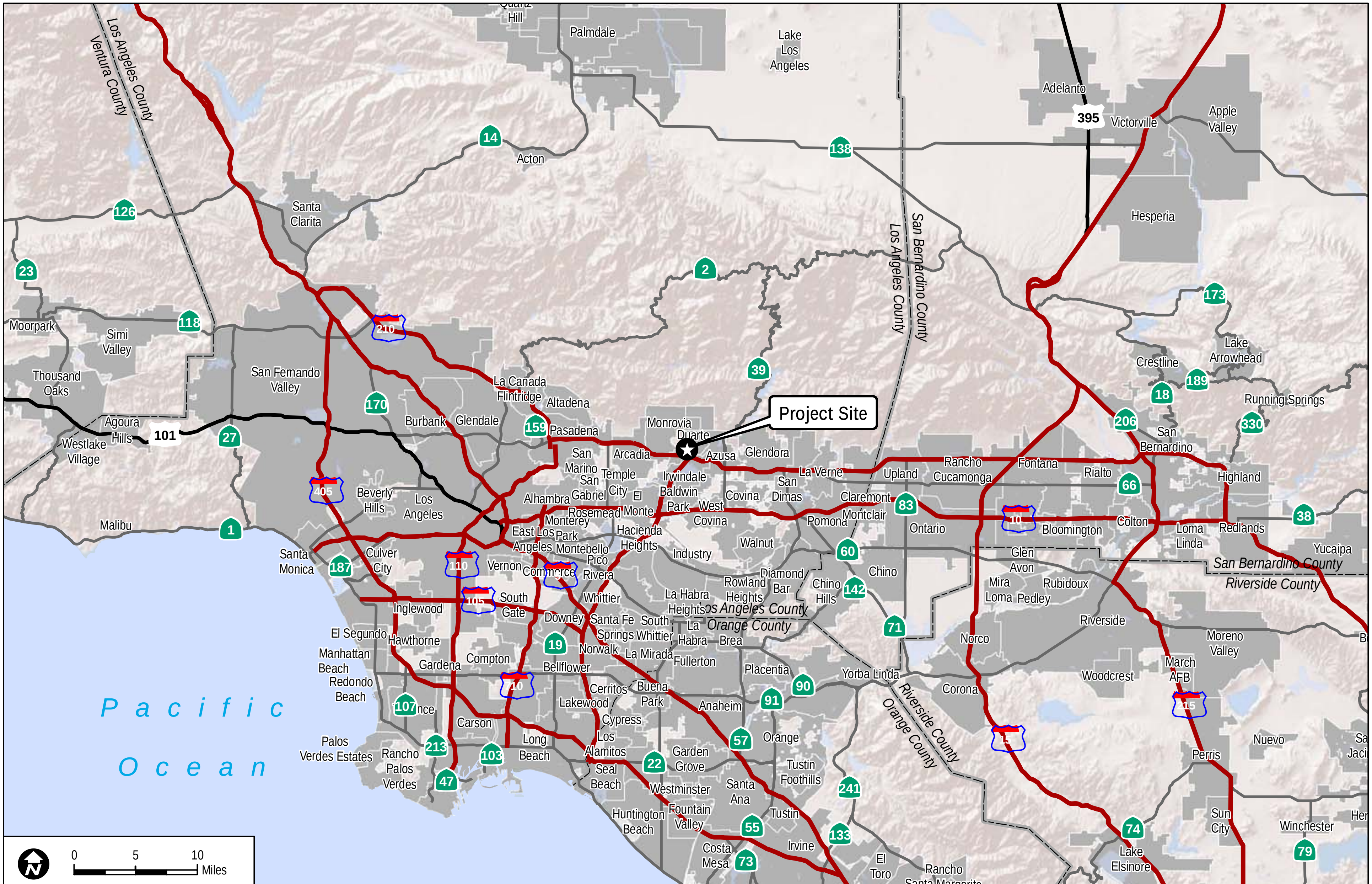

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FIGURE 1

Regional Map

Royal Oaks Tree Preservation and Protection Plan

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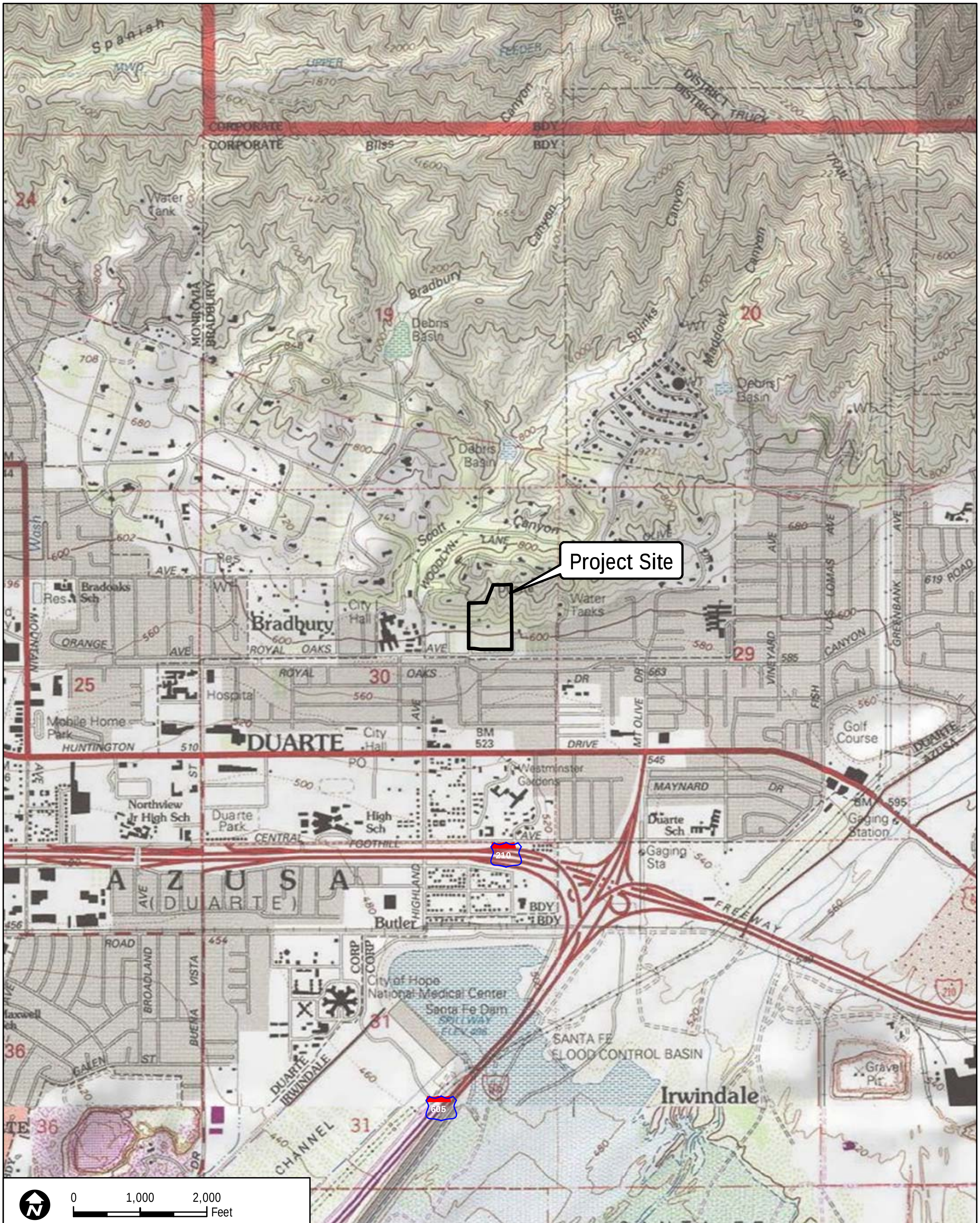

SOURCE: USGS 7.5-Minute Series Azusa Quadrangle.

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FIGURE 2
Vicinity Map

Royal Oaks Tree Preservation and Protection Plan

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2 METHODS

2.1 Individual Tree Evaluation

Dudek mapped and collected tree attribute information for all trees within and immediately adjacent to the tree survey area meeting the City of Bradbury's definition of a "protected tree," which includes native, prominent, significant, and orchard trees that have a minimum diameter of 4 inches at 24 inches above final grade. The location of each individual mature tree was mapped using a Trimble Pathfinder Pro XH Global Positioning System (GPS) receiver (Appendix A). The Pathfinder has a horizontal accuracy of 1-meter (1-sigma) using differential code positioning techniques. Since tree canopies can sometimes cause loss of satellite lock by blocking the line-of-sight to satellites, an electronic compass and reflectorless electronic distance measuring (EDM) device was also used in mapping tree locations. The EDM/compass combination operates in concert with the Pathfinder system to position offsets, and offset information is automatically attached to the GPS position data string. Protected trees were tagged in the field with an aluminum tree tag bearing a unique identification number. The tags were placed on the trunk of each inventoried tree and tag numbers correspond with the individual tree data presented in Appendix B.

Concurrent with tree mapping efforts, Dudek arborists collected tree attribute data including species, quantity of individual trunks, individual trunk diameters, overall height, canopy extent, and general health and structural conditions. Trunk diameter measurements were collected at 24 inches above the ground along the trunk axis as described in Section 9.06.090.030 of the City's Municipal Code, with a few common exceptions. In cases where a tree's trunk is located on a slope, the 2-foot distance was approximated as the average of the shortest and longest sides of the trunk (i.e., the uphill side and downhill side of a tree's trunk, respectively) and the measurement was made at the circumference of the trunk at this point. Tree height measurements were ocular estimates made by experienced field arborists. Tree canopy diameters were typically estimated by "pacing-off" the measurement based on the investigator's knowledge of his stride length or by visually estimating the canopy width. The tree crown diameter measurements were made along an imaginary line intersecting the tree trunk that best approximated the average canopy diameter.

Pursuant to the *Guide for Plant Appraisal* (ISA 2000), tree health and structure were evaluated with respect to five distinct tree components: roots, trunk(s), scaffold branches, small branches, and foliage. Each component of the tree was assessed with regard to health factors such as insect, fungal, or pathogen damage; fire damage; mechanical damage; presence of decay; presence of wilted or dead leaves; and wound closure. Components were graded as *good, fair*, *poor*, and *dead*, with "good" representing no apparent problems, and "dead" representing a dying and/or dead tree. This method of tree condition rating is comprehensive and results in ratings that are useful for determining the status of trees based on common standards. Trees in natural settings have important habitat value, as evidenced by numerous cavity nesters and insects that thrive on and within oak trees, even when they are considered in poor structural or health condition. However, this assessment focuses on tree condition with regards to health and structure for purposes of analyzing potential project impacts and where necessary, providing recommendations for mitigating potential tree hazards, such as trees with weak limb attachments, cavities and rot, or excessive lean.

Upon completion of field data collection and mapping, raw GPS data was post-processed using GPS Pathfinder Office (v 3.10), and individual tree location data was compiled and updated in a geographic information system (GIS). The digital tree locations were linked to individual tree identification numbers and associated tree attribute data. This data set was then evaluated using ArcGIS (v. 10.1) software to determine the position of individual trees related to the proposed project development areas. Data resulting from this analysis was utilized to evaluate the individual tree impact totals presented in this report.

2.2 Scope of Work Limitations

No root crown excavations or investigations, aerial evaluations, or internal probing was performed during the tree assessments. Therefore, the presence or absence of internal decay or other hidden inferiorities in individual trees could not be confirmed. It is recommended that any large tree proposed for preservation in an area that receives human use be thoroughly inspected for internal, or subterranean, decay by a qualified ISA-certified arborist before finalizing preservation plans.

3 OBSERVATIONS

3.1 Individual Trees

There are 465 trees located within and immediately adjacent to the Royal Oaks tree survey area and include 26 different tree species that meet the City's criteria for a "protected tree." As Table 1 indicates, most of the inventoried trees (50.3%) are native to California, including Arizona ash, coast live oak, Engelmann oak, western cottonwood, toyon, sumac, and Mexican elderberry. The coast live oak and Engelmann oak trees are considered the highest value trees on this site. Table 1 provides a summary of the 26 species mapped and evaluated within the tree survey area. The Tree Location Exhibit in Appendix A presents the location of the individual trees mapped and assessed for the Royal Oaks project.

Overall, the trees exhibit growth and structural conditions that are typical of their locations as landscape, orchard, and natural trees. The trees include various trunk and branch maladies as well as varying health and structural conditions. As presented in the Tree Information Matrix in Appendix B, most of the individually mapped trees, a total of 49.2% (229 trees), exhibit fair health condition, 9.3% (43 trees) are in good health condition, 28.4% (132 trees) in poor health, and 13.1% (61 trees) are dead. Structurally, 0.4% (2 trees) of the individually mapped trees are considered to exhibit good structure, 58.7% (273 trees) exhibit fair structure, 28.7% (129 trees) exhibit poor structure, and 13.1% (61 trees) exhibit are dead. Good condition trees exhibit acceptable vigor, healthy foliage, adequate structure, and lack of any major maladies. Fair condition trees are typical, with few maladies, but declining vigor. Poor condition trees exhibit declining vigor, unhealthy foliage, poor branch structure, or excessive lean. A majority of the trees found to be dead or in poor health are located in the site's in-active orchard areas. The trees located throughout the orchard are of poor quality and have not been maintained in several years.

Table 1
Summary of Trees Royal Oak Project Site

Scientific Name	Common Name	Number of Trees
Archontophoenix alexandrae	King palm	5
Brachychiton acerfolius	Flame tree	1
Ceratonia siliqua	Carob	3
Citrus aurantifolia	Lime	7
Citrus x limon	Lemon	2
Eucalyptus globulus	Blue gum eucalyptus	1
Ficus edulis	Edible fig	7
Fraxinus uhdei	Shamel ash	2
Fraxinus velutina	Arizona ash	25

Table 1
Summary of Trees Royal Oak Project Site

Scientific Name	Common Name	Number of Trees
Grevillea robusta	Silk oak	3
Heteromeles arbutifolia	Toyon	3
Koelreuteria bipinnata	Chinese flame tree	1
Malus alba	White mulberry	3
Persea americana	Avocado	149
Pinus pinea	Stone pine	1
Populus fremontii	Western cottonwood	1
Prunus spp.	Prunus	4
Quercus agrifolia	Coast live oak	209
Quercus engelmannii	Engelmann oak	2
Quercus suber	Cork oak	2
Rhus ovata	Sumac	7
Sambucus mexicana	Mexican elderberry	12
Schinus terebinthifolius	Brazilian pepper	1
Tipuana tipu	Tipu	2
Ulmus parvifolia	Chinese elm	11
Unknown	Unknown (dead)	1
	Total	**465**

Trees within the tree survey area vary in size and stature according to species and available growing space. The site’s Coast live oak and Engelmann oak trees are primarily single-stemmed with trunk diameters (diameter at 24 inches above finished grade) ranging from 4–32 inches. Multi-stemmed oak trees with 2–5 stems have combined diameters up to 64 inches. Single and multi-stemmed non-native species have diameters between 4–25 inches. Tree heights vary from 6–70 feet. Tree canopy extents range from 4 feet to nearly 70 feet. Over 45% of the trees on site exhibit canopy spreads that are greater than 20 feet across at their widest points.

4 TREE PRESERVATION

4.1 Regulatory Definitions and Requirements

The following section summarizes the relevant policies regulating tree impact and removal associated with the Royal Oaks project.

4.1.1 City of Bradbury

The City of Bradbury's Tree Preservation and Protection Ordinance (Chapter 9.06.090 of the City's Municipal Code) requires a tree report be prepared for removal of protected trees species.

Section 9.06.090.030 (Definitions):

- **Tree:** Tree shall mean a woody perennial plan which usually has (but is not limited to) a single dominant trunk and has a mature height of fifteen feet (15') or more, or has a trunk diameter of four inches (4") or more measured at twenty-four inches (24") above finished grade.
- **Native Tree:** Any woody plant species indigenous to the desert, foothills or canyons of Southern California prior to the California Mission Period, provided that the plant has an expected mature trunk size of six inches (6") DBH and has an expected mature height of fifteen feet (15') or higher. Giant Sequoias, Redwoods (*Sequoiadendron sempervirens*), and Dawn Red-woods (*Metasequoia glyptostroboides*), evergreen native Oaks (such as *Quercus agrifolia*, *engelmannii*), deciduous Oaks (such as *Quercus lobata*, and *kelloggii*) are to be regarded as important native trees even though they have been planted by man, introduced (or possibly reintroduced) into the Southern California foothill and canyon environments.
- **Prominent Tree:** Any woody perennial plant with a trunk DBH of six inches (6") or more, and having an expected mature height of fifteen feet (15') or higher.
- **Significant Tree:** Any non-native or exotic tree with a trunk DBH of six inches (6") or more, and having an expected mature height of fifteen feet (15') or higher, and known to survive in the Southern California environment.
- **Orchard Tree:** Any trees located in an area primarily used for growing fruit trees or nut trees or any other agricultural commodity

Section 9.06.090.060 (Prohibitions):

- **Removal of Native Trees and/or Prominent Trees:** No prominent tree, native tree of any other tree defined in Section 9.06.090.030 and/or which is of a desirable genus and species shall be removed without first obtaining a permit to do so. The City manager shall issue such permits only after the presentation of photographs and/or drawings showing that the prominent tree is a significant health or fire hazard or has become an extremely severe detriment to the view of the mountains or valley from house sites. A 14-day waiting period is created hereby, during which time appeals to any decisions, restrictions or conditions made by the City Manager on the permit may be submitted in writing to the Planning Commission. Should an appeal be filed, the 14-day holding period is extended automatically until the next Planning Commission meeting for which the item can be placed on the agenda.

- **Removal of Orchard Trees:** No orchard tree shall be removed without first obtaining a permit to do so. The City manager shall issue such permits only after the presentation of photographs and/or drawings showing that the prominent tree is a significant health or fire hazard or has become an extremely severe detriment to the view of the mountains or valley from house sites. A 14-day waiting period is created hereby, during which time appeals to any decisions, restrictions or conditions made by the City Manager on the permit may be submitted in writing to the Planning Commission. Should an appeal be filed, the 14-day holding period is extended automatically until the next Planning Commission meeting for which the item can be placed on the agenda.

4.1.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (1918) requires tree removal and potentially disturbing construction activities to occur during certain time periods to avoid harassment of nesting birds. According to this Act, no construction or other disturbing activities can occur within 500 feet of an active bird nest during the period beginning in January and ending in June each year. Biological surveys should be conducted to provide clearance for project initiation.

4.2 Impacts

Tree impacts were determined using GIS technology and spatial locations of trees relative to the project impact areas (limits of grading). Impacts were further determined based on Dudek's experience with native and non-native trees and their typical reactions to root disturbances from construction activities such as soil compaction, excavation, and remedial grading. The impact analysis results presented herein were utilized for developing appropriate mitigation measures for the project.

Impacts to trees can be classified as either direct or indirect. Direct impacts to trees related to site improvements are typically the result of physical injuries or changes caused by machinery involved with the development process. Direct impacts include tree removal, root damage, soil excavation and compaction, grade changes, loss of canopy, and trunk wounds, among others. Indirect impacts to trees are the result of changes to the site that may cause tree decline, even when the tree is not directly injured. Indirect impacts include alterations to stream flow rates, diversion of ground water flow, introduction of exotic plant species, and alterations to disturbance regimes. Wider-scale alterations to the area near trees as well as specific changes that occur around the trees are important considerations.

In general, there is a great deal of variation in tolerance to construction impacts among tree species, ages, and conditions. It is important to know how a certain tree, based on its species, age, and condition, would respond to different types of disturbance. The trees in the proposed project area are of varying ages and conditions. Mature specimens are typically more sensitive to root disturbance and grade changes. In general, healthy trees will respond better to changes in their growing environment. Trees of poor health or stressed conditions may not be vigorous enough to cope with direct or indirect impacts from construction activities.

Impacts totals presented herein are based on conceptual disturbance limits, fuel modification zones, and development plans as of the date of this TPPP. As such, the actual number of trees that are subject to direct and indirect impacts may change as the detailed site planning process proceeds.

4.2.1 Direct Tree Impacts

For the purposes of this report, direct impacts are those associated with tree removal or encroachment within the tree protected zone (canopy drip line plus 5 feet or 15 feet from trunk, whichever is greater). Tree removal is expected to be required when the trunk is located inside or within 2 feet of the proposed limits of grading. Encroachment is expected when soil and roots are disturbed within the tree protected zone. Table 2 summarizes the total number of trees, by species, that are expected to be subject to direct construction-related impacts. The locations of impacted trees, by impact type, are presented in the map in Appendix C. Measures to minimize the extent of impact to preserved trees are provided in Appendix D.

Table 2
Summary of All Direct Tree Impacts – Royal Oaks

Scientific Name	Common Name	Removal	Encroachment
Archontophoenix alexandrae	King palm	5	0
Brachychiton acerfolius	Flame tree	1	0
Ceratonia siliqua	Carob	1	0
Citrus aurantifolia	Lime	7	0
Citrus x limon	Lemon	1	0

Table 2
Summary of All Direct Tree Impacts – Royal Oaks

Scientific Name	Common Name	Removal	Encroachment
Eucalyptus globulus	Blue gum	—	1
Ficus edulis	Fig	4	0
Fraxinus uhdei	Shamel ash	—	1
Fraxinus velutina	Arizona ash	9	1
Grevillea robusta	Silk oak	2	0
Koelreuteria bipinnata	Chinese flame tree	—	1
Malus alba	White mulberry	2	0
Persea americana	Avocado	14	0
Pinus pinea	Stone pine	1	0
Populus fremontii	Western cottonwood	1	0
Prunus spp.	Prunus	2	0
Quercus agrifolia	Coast live oak	70	13
Quercus engelmannii	Engelmann oak	—	2
Quercus suber	Cork oak	2	0
Sambucus mexicana	Mexican elderberry	2	0
Tipuana tipu	Tipu	2	0
Ulmus parvifolia	Chinese elm	5	1
	Totals	**131**	**20**

4.2.2 Indirect Tree Impacts

Indirect impacts to trees are the result of changes to the site that may cause tree decline, even when the tree is not directly injured. Site-wide changes affecting trees include diverting runoff and storm water, creating retention and detention ponds, relocating streams or making improvements to streams, lowering or raising water tables, altering the capacity for soil moisture recharge, removing vegetation, or damming underground water flow (Matheny and Clark 1998). For the purposes of this report, indirect tree impacts are expected for trees within 25 feet of the project's limits of grading and not subject to removal or encroachment. Trees located in fuel modification zones are also typically considered indirectly impacted; however, at the time of this TPPP, the extent of the fuel modifications zones are unknown. Table 3 presents the number of trees expected to be indirectly impacted by the proposed project.

Table 3
Summary of Indirect Tree Impacts – Royal Oaks

Scientific Name	Common Name	Indirect Impact
Fraxinus velutina	Arizona ash	1
Persea americana	Avocado	1
Quercus agrifolia	Coast live oak	1
	Total	**3**

4.2.3 Tree Removals Due to Health

Tree removals due to health are the result of changes to the site prior to construction that may cause tree decline, even when the tree is not directly injured. The project contains an in-active avocado orchard that has not received irrigated for an extended period of time, resulting in the death and decline in 192 trees classified as dead or in poor health. Of these 192 trees, 131 are avocado and 61 are protected trees that are located adjacent or within the inactive orchard. Table 4 presents the number of trees expected to be removed due to health. These removals should be removed as nuisance trees as per the classification in Title 9.06.090.060 for the City's Municipal Code. These tree removals are not to be mitigated.

Table 4
Summary of Health Related Removals – Royal Oaks

Scientific Name	Common Name	Total
Citrus x limon	Lemon	1
Fraxinus velutina	Arizona ash	8
Malus alba	White mulberry	1
Persea americana	Avocado	131
Prunus spp.	Prunus	1
Quercus agrifolia	Coast live oak	40
Sambucus mexicana	Mexican elderberry	7
Ulmus parvifolia	Chinese elm	2
Unknown		1
	Total	**192**

4.2.3.1 Tree Impact Summary – All Trees (Proposed Project)

In total, it is estimated that 131 (28.1%) protected trees will require removal due to direct impacts; 20 (4.3%) will experience encroachment into the tree protected zone; 3 (0.7 %) will be indirectly impacted; 119 (25.6%) will be preserved in place with no direct impacts; and 192

(41.3%) trees will require removal due to health. Of the 192 trees identified for health removal, 61 meet the criteria for classification as a protected tree, and 131 avocado trees meet the criteria for classification as an orchard tree as defined by the City. In addition, one coast live oak tree is indirectly impacted.

5 MITIGATION

The City of Bradbury Municipal Code does not identify specific tree replacement standards for projects affecting native and/or protected trees. The City does require the submission of a tree preservation and landscaping plan per the Title 9.06.090.040 of the Municipal Code. The 192 trees identified as removals due to health should be removed as nuisance trees as per the classification in Title 9.06.090.060 for the City's Municipal Code as they pose a significant fire hazard. In Dudek's professional opinion, the direct impact to 70 coast live oaks and encroachment on an additional 20 oak trees (including 13 coast live oaks and 2 Engelmann oaks) requires mitigation tree planting. This impact mitigation planting should focus on container oak plantings into the built landscape and hillside oak woodlands at a ratio of 3 to 1 (3 replacement trees for every 1 impacted tree).A variety of other tree species can be used though proportionally the plantings should focus on coast live oaks. Table 5 presents the number of trees impacted by type and recommended mitigation.

Table 5
Summary of Impacts and Recommended Mitigation – Royal Oaks

Tree Type	Number of Impacts	Number of Replacement Trees
Direct Impact	131	393
Encroachment	20	60
Indirect Impact	3	0
Health Related	192	0
Totals	**151**	**453**

5.1 Potential Relocation Candidates

Of the directly impacted protected trees, a total of 13 are considered "candidates" for relocation. However, tree relocation is not a requirement of the City or of this TPPP. Potential relocation candidate oak trees exhibit good health and structure, have no uncorrectable, outwardly detectable defects, and reveal no signs or symptoms of serious pest infestation or disease. Table 6 provides a summary of the proposed relocation candidates, by species and Appendix B details which trees are the relocation candidates.

Table 6
Summary of Relocation Candidates by Species

Botanical Name	Common Name	Relocation Candidates
Quercus agrifolia	Coast live oak	13
	Total	**13**

Should the project applicant determine that relocating trees is desired, the final quantity of relocation trees should be determined following tree relocation contractor inspection, root crown investigations or internal probing and root pruning operations. The relocation process is stressful for trees and often results in tree loss. Therefore, it should be performed by an experienced tree relocation contractor and follow standard tree relocation processes to maximize the probability of relocation success.

5.2 Tree Removal Permit

Consistent with Title 9.06.090.050 of the City's Municipal Code (City of Bradbury 2012), a tree removal permit will be required prior to all tree removals.

6 CONCLUSIONS

Dudek inventoried and evaluated 465 regulated trees at the Royal Oaks project site. A total of 151 trees would be impacted by the proposed project. Furthermore, an additional 192 trees classified as dead or in poor health will require removal. The City of Bradbury Municipal Code does not identify specific tree replacement standards for projects affecting native and/or protected trees. The City does require the submission of a tree preservation and landscaping plan. The direct impact of 70 coast live oaks and encroachment on an additional 20 oak trees (including 13 coast live oaks and 2 Engelmann oaks) is considered by Dudek to require mitigation. These impacts can be mitigated through the incorporation of container size (15 gallon is a common planting size) oak plantings into the built landscape and smaller, seedling, 1-, and 5-gallon plantings in the hillside oak woodlands at ratio of 3 to 1. The applicant will submit landscape plans separately during Phase 2 of the project. Note that any oaks planted in the hillside areas will require ongoing irrigation for at least 3 years following establishment and then a weaning off period over the course of 1 or 2 years. An oak restoration plan may be warranted for this area.

Arborist's Statement

This report provides conclusions and recommendations based on an examination of the trees and surrounding site by ISA-certified arborists. Arborists are tree specialists who use their education, knowledge, training, and experience to examine trees, recommend measures to enhance the beauty and health of trees, and attempt to reduce the risk of living near trees.

No root crown excavations, investigations, or internal probing was performed during the tree assessments. Therefore, the presence or absence of internal decay or other hidden inferiorities in individual trees could not be confirmed. It is recommended that any large tree proposed for preservation in an area that receives human use be thoroughly inspected for internal or subterranean decay by a qualified arborist before finalizing preservation plans.

Arborists cannot detect every condition that could possibly lead to the failure of a tree. Trees are living organisms that fail in ways not fully understood. Conditions are often hidden within trees and belowground. Arborists cannot guarantee that a tree will be healthy or safe under all circumstances or for a specified period. There are no guarantees that a tree's condition will not change over a short or long period due to weather or cultural or environmental conditions. Trees can be managed but not controlled.

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7 REFERENCES

City of Bradbury. 2012. City of Bradbury Municipal Code. February 2012. Accessed October 9, 2015. http://www.cityofbradbury.org/city-services/municipal-code

ISA (International Society of Arboriculture). 2000. *Guide for Plant Appraisal*. 9th ed. Council of Tree and Landscape Appraisers.

Matheny and Clark. 1998. *Trees and Development. A Technical Guide to Preservation of Trees During Land Development*. International Society of Arboriculture.

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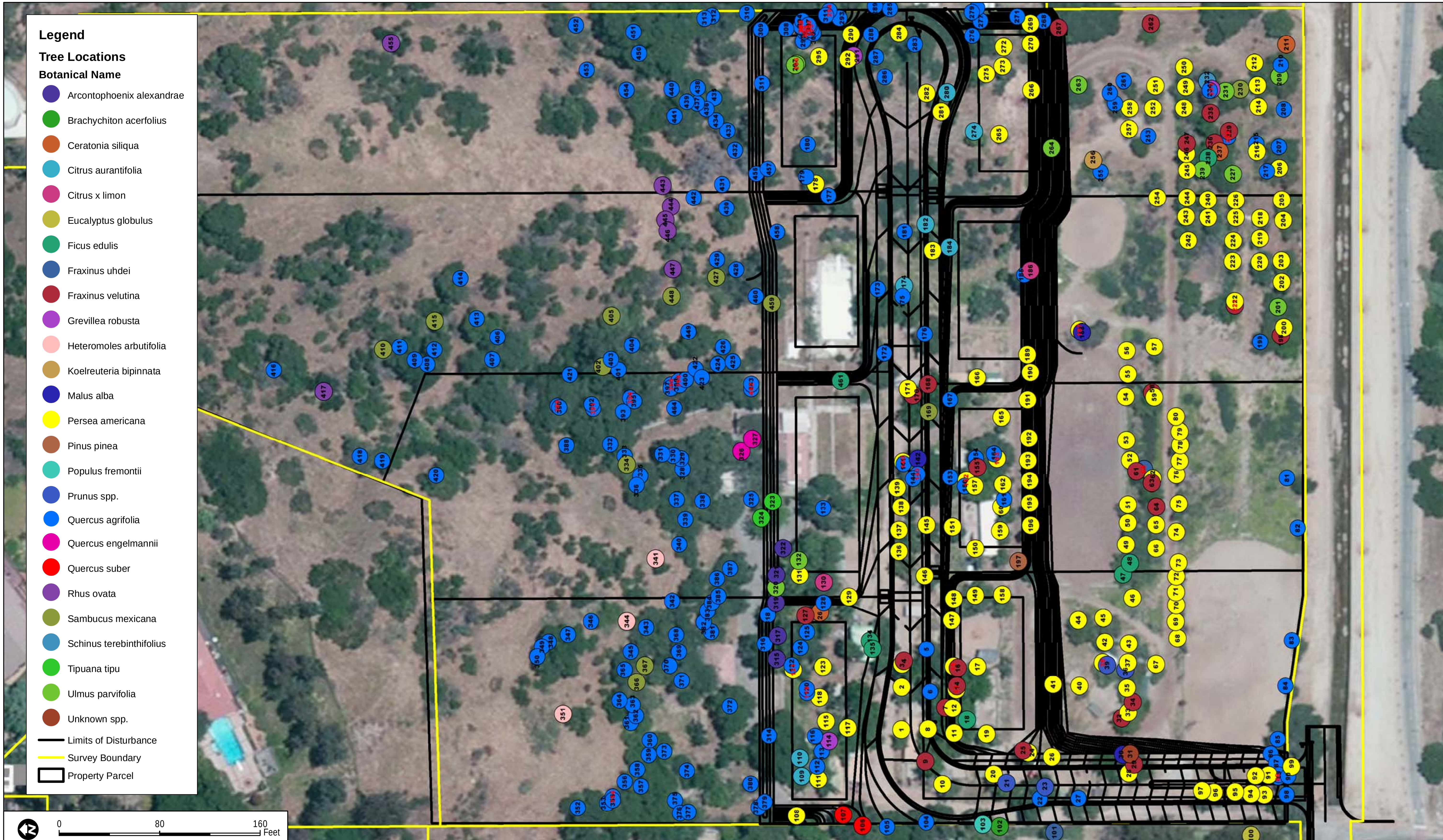
APPENDIX A

Tree Location Exhibit



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Appendix A

Tree Location Exhibit

Royal Oaks Tree Preservation and Protection Plan

APPENDIX B

Tree Data Matrix

Appendix B - Tree Information Matrices - Royal Oaks Project

				Individual Stem												
Tree #	Botanical Name	Common Name	Diameter (in.)	D1	D2	D3	D4	D5	Height (ft.)	Canopy (ft.)	Health	Structure	Relocation Potential	Impact Status	X	Y
1	*Persea americana*	Avocado	11	11	0	0	0	0	12	10	Poor	Poor		Remove - Health	-117.964	34.14468
2	*Persea americana*	Avocado	12	12	0	0	0	0	14	10	Poor	Poor		Remove - Health	-117.964	34.14467
3	*Persea americana*	Avocado	15	12	9	0	0	0	18	10	Poor	Poor		Remove - Health	-117.964	34.14467
4	*Fraxinus velutina*	Arizona ash	8	8	0	0	0	0	40	14	Fair	Fair		Direct Impact	-117.964	34.14467
5	*Quercus agrifolia*	Coast live oak	18	18	0	0	0	0	30	25	Fair	Fair		Direct Impact	-117.964	34.14462
6	*Quercus agrifolia*	Coast live oak	11	11	0	0	0	0	30	25	Good	Good	Yes	Direct Impact	-117.964	34.14461
7	*Fraxinus velutina*	Arizona ash	14	14	0	0	0	0	65	25	Good	Fair		Direct Impact	-117.964	34.14458
8	*Persea americana*	Avocado	15	15	0	0	0	0	24	30	Fair	Fair		Direct Impact	-117.964	34.14462
9	*Fraxinus velutina*	Arizona sah	10	10	0	0	0	0	50	20	Good	Fair		Direct Impact	-117.964	34.14462
10	*Persea americana*	Avocado	8.485281	6	6	0	0	0	20	18	Fair	Poor		Direct Impact	-117.964	34.14459
11	*Persea americana*	Avocado	14.73092	10	9	6	0	0	20	22	Fair	Poor		Direct Impact	-117.964	34.14456
12	*Persea americana*	Avocado	15.6205	12	8	6	0	0	24	24	Fair	Fair		Direct Impact	-117.964	34.14456
13	*Persea americana*	Avocado	12.80625	10	8	0	0	0	22	24	Fair	Fair		Direct Impact	-117.964	34.14456
14	*Fraxinus velutina*	Arizona ash	13	13	0	0	0	0	60	30	Fair	Fair		Direct Impact	-117.964	34.14455
15	*Persea americana*	Avocado	13	13	0	0	0	0	22	20	Dead	Dead		Remove - Health	-117.964	34.14456
16	*Fraxinus velutina*	Arizona ash	4	4	0	0	0	0	24	8	Poor	Fair		Remove - Health	-117.964	34.14455
17	*Persea americana*	Avocado	16.5	17	0	0	0	0	24	20	Poor	Poor		Remove - Health	-117.964	34.14451
18	*Ficus edulis*	Fig	7.071068	5	5	0	0	0	20	15	Good	Poor		Direct Impact	-117.964	34.14453
19	*Persea americana*	Avocado	12.32883	6	10	4	0	0	15	18	Poor	Poor		Remove - Health	-117.964	34.14449
20	*Persea americana*	Avocado	14.86607	10	11	0	0	0	22	30	Fair	Fair		Direct Impact	-117.964	34.14447
21	*Prunus spp.*	Prunus	4	4	0	0	0	0	18	10	Fair	Fair		Direct Impact	-117.964	34.14445
22	*Quercus agrifolia*	Coast live oak	18	18	0	0	0	0	35	30	Good	Fair		Direct Impact	-117.964	34.14437
23	*Prunus spp.*	Prunus	10	10	0	0	0	0	30	16	Fair	Poor		Direct Impact	-117.964	34.14436
24	*Persea americana*	Avocado	10	8	6	0	0	0	14	12	Dead	Dead		Remove - Health	-117.964	34.1444
25	*Fraxinus velutina*	Arizona ash	8	8	0	0	0	0	30	14	Fair	Fair		Direct Impact	-117.964	34.14441
26	*Persea americana*	Avocado	13.45362	10	9	0	0	0	16	18	Dead	Dead		Remove - Health	-117.964	34.14435
27	*Quercus agrifolia*	Coast live oak	15	15	0	0	0	0	27	24	Good	Fair		Direct Impact	-117.964	34.14429
28	*Persea americana*	Avocado	8	8	0	0	0	0	16	8	Dead	Dead		Remove - Health	-117.964	34.14418
29	*Fraxinus velutina*	Arizona ash	10	10	0	0	0	0	55	20	Fair	Fair		Direct Impact	-117.964	34.14417
30	*Malus alba*	White mulberry	10.86278	8	4	3	2	5	20	18	Fair	Fair		Direct Impact	-117.964	34.14419
31	*Unknown* spp.	Unknown spp.	12	12	0	0	0	0	22	20	Dead	Dead		Remove - Health	-117.964	34.14418
32	*Fraxinus velutina*	Arizona ash	8	8	0	0	0	0	35	15	Fair	Fair		Encroachment	-117.964	34.14419
33	*Persea americana*	Avocado	12	12	0	0	0	0	22	28	Fair	Fair		Indirect Impact	-117.964	34.14418
34	*Fraxinus velutina*	Arizona ash	6.708204	6	3	0	0	0	20	14	Fair	Fair		Indirect Impact	-117.964	34.14417
35	*Persea americana*	Avocado	16.27882	12	11	0	0	0	20	23	Poor	Poor		Remove - Health	-117.964	34.14418
36	*Prunus spp.*	Prunus	8.944272	8	4	0	0	0	20	20	Dead	Dead		Remove - Health	-117.964	34.14419
37	*Persea americana*	Avocado	12.0416	9	8	0	0	0	20	22	Fair	Poor			-117.964	34.14418
38	*Persea americana*	Avocado	12	12	0	0	0	0	20	18	Poor	Poor		Remove - Health	-117.964	34.14424
39	*Prunus spp.*	Prunus	5.385165	4	2	3	0	0	18	12	Fair	Fair			-117.964	34.14423

Appendix B - Tree Information Matrices - Royal Oaks Project

				Individual Stem												
Tree #	Botanical Name	Common Name	Diameter (in.)	D1	D2	D3	D4	D5	Height (ft.)	Canopy (ft.)	Health	Structure	Relocation Potential	Impact Status	X	Y
40	*Persea americana*	Avocado	9	9	0	0	0	0	12	10	Poor	Poor		Remove - Health	-117.964	34.14429
41	*Persea americana*	Avocado	16.30951	12	8	3	7	0	20	20	Fair	Poor		Direct Impact	-117.964	34.14434
42	*Persea americana*	Avocado	14.86607	10	11	0	0	0	30	26	Poor	Poor		Remove - Health	-117.964	34.14423
43	*Persea americana*	Avocado	13.60147	13	4	0	0	0	26	25	Poor	Poor		Remove - Health	-117.964	34.14418
44	*Persea americana*	Avocado	15	15	0	0	0	0	28	25	Poor	Poor		Remove - Health	-117.964	34.14429
45	*Persea americana*	Avocado	14.42221	12	8	0	0	0	23	18	Poor	Poor		Remove - Health	-117.964	34.14423
46	*Persea americana*	Avocado	17	15	8	0	0	0	20	20	Dead	Dead		Remove - Health	-117.964	34.14417
47	*Ficus edulis*	Fig	13.89244	12	7	0	0	0	20	20	Fair	Fair			-117.964	34.14419
48	*Ficus edulis*	Fig	12.72792	7	6	6	5	4	20	30	Fair	Fair			-117.964	34.14418
49	*Persea americana*	Avocado	13	13	0	0	0	0	28	20	Dead	Dead		Remove - Health	-117.964	34.14418
50	*Persea americana*	Avocado	13	13	0	0	0	0	28	20	Fair	Poor			-117.964	34.14418
51	*Persea americana*	Avocado	14	14	0	0	0	0	28	20	Poor	Poor		Remove - Health	-117.964	34.14418
52	*Persea americana*	Avocado	8.944272	8	4	0	0	0	16	20	Poor	Poor		Remove - Health	-117.963	34.14418
53	*Persea americana*	Avocado	13	13	0	0	0	0	22	12	Poor	Poor		Remove - Health	-117.963	34.14418
54	*Persea americana*	Avocado	16.7332	12	10	6	0	0	22	20	Poor	Poor		Remove - Health	-117.963	34.14418
55	*Persea americana*	Avocado	13	13	0	0	0	0	20	20	Dead	Dead		Remove - Health	-117.963	34.14418
56	*Persea americana*	Avocado	9	9	0	0	0	0	12	10	Dead	Dead		Remove - Health	-117.963	34.14418
57	*Persea americana*	Avocado	14	14	0	0	0	0	22	18	Poor	Poor		Remove - Health	-117.963	34.14412
58	*Fraxinus velutina*	Arizona ash	6	6	0	0	0	0	24	8	Fair	Fair			-117.963	34.14413
59	*Persea americana*	Avocado	12.72792	9	9	0	0	0	18	16	Poor	Poor		Remove - Health	-117.963	34.14412
60	*Fraxinus uhdei*	Shamel ash	4.690416	3	3	2	0	0	20	12	Fair	Fair			-117.963	34.14415
61	*Fraxinus velutina*	Arizona ash	7.071068	5	5	0	0	0	25	12	Fair	Fair			-117.963	34.14416
62	*Persea americana*	Avocado	10.77033	10	4	0	0	0	18	15	Poor	Poor		Remove - Health	-117.964	34.14413
63	*Fraxinus velutina*	Arizona ash	8	8	0	0	0	0	30	20	Fair	Fair			-117.964	34.14413
64	*Fraxinus velutina*	Arizona ash	15.55635	11	11	0	0	0	15	15	Poor	Poor		Remove - Health	-117.964	34.14412
65	*Persea americana*	Avocado	15	15	0	0	0	0	16	20	Poor	Poor		Remove - Health	-117.964	34.14412
66	*Persea americana*	Avocado	13	13	0	0	0	0	25	15	Dead	Dead		Remove - Health	-117.964	34.14412
67	*Persea americana*	Avocado	13	13	0	0	0	0	18	15	Dead	Dead		Remove - Health	-117.964	34.14412
68	*Persea americana*	Avocado	9	9	0	0	0	0	18	6	Dead	Dead		Remove - Health	-117.964	34.14407
69	*Persea americana*	Avocado	9	9	0	0	0	0	18	6	Poor	Poor		Remove - Health	-117.964	34.14408
70	*Persea americana*	Avocado	9	9	0	0	0	0	18	6	Poor	Poor		Remove - Health	-117.964	34.14407
71	*Persea americana*	Avocado	11	11	0	0	0	0	20	6	Dead	Dead		Remove - Health	-117.964	34.14408
72	*Persea americana*	Avocado	11	11	0	0	0	0	35	10	Poor	Poor		Remove - Health	-117.964	34.14407
73	*Persea americana*	Avocado	11	11	0	0	0	0	30	10	Poor	Poor		Remove - Health	-117.964	34.14407
74	*Persea americana*	Avocado	11	11	0	0	0	0	24	15	Poor	Poor		Remove - Health	-117.964	34.14407
75	*Persea americana*	Avocado	12	12	0	0	0	0	25	15	Poor	Poor		Remove - Health	-117.964	34.14407
76	*Persea americana*	Avocado	12	12	0	0	0	0	30	12	Poor	Poor		Remove - Health	-117.964	34.14407
77	*Persea americana*	Avocado	11	11	0	0	0	0	30	12	Dead	Dead		Remove - Health	-117.963	34.14407
78	*Persea americana*	Avocado	9	9	0	0	0	0	35	12	Poor	Poor		Remove - Health	-117.963	34.14407

Appendix B - Tree Information Matrices - Royal Oaks Project																
				Individual Stem												
Tree #	**Botanical Name**	**Common Name**	**Diameter (in.)**	**D1**	**D2**	**D3**	**D4**	**D5**	**Height (ft.)**	**Canopy (ft.)**	**Health**	**Structure**	**Relocation Potential**	**Impact Status**	**X**	**Y**
79	*Persea americana*	Avocado	12	12	0	0	0	0	30	13	Poor	Poor		Remove - Health	-117.963	34.14407
80	*Persea americana*	Avocado	12	12	0	0	0	0	30	13	Poor	Poor		Remove - Health	-117.963	34.14408
81	*Quercus agrifolia*	Coast live oak	11	11	0	0	0	0	30	20	Fair	Fair			-117.964	34.14383
82	*Quercus agrifolia*	Coast live oak	9.848858	9	4	0	0	0	23	15	Fair	Fair			-117.964	34.14381
83	*Quercus agrifolia*	Coast live oak	12.80625	10	8	0	0	0	25	24	Fair	Fair			-117.964	34.14382
84	*Quercus agrifolia*	Coast live oak	7	7	0	0	0	0	23	12	Fair	Fair			-117.964	34.14384
85	*Quercus agrifolia*	Coast live oak	33.54102	30	15	0	0	0	30	30	Fair	Fair		Encroachment	-117.964	34.14385
86	*Quercus agrifolia*	Coast live oak	9	9	0	0	0	0	30	12	Dead	Dead		Remove - Health	-117.964	34.14387
87	*Quercus agrifolia*	Coast live oak	24	24	0	0	0	0	35	35	Fair	Fair		Direct Impact	-117.964	34.14386
88	*Quercus agrifolia*	Coast live oak	18	18	0	0	0	0	35	35	Fair	Fair		Direct Impact	-117.964	34.14385
89	*Quercus agrifolia*	Coast live oak	17	17	0	0	0	0	35	40	Fair	Fair		Direct Impact	-117.964	34.14385
90	*Quercus agrifolia*	Coast live oak	4	4	0	0	0	0	10	8	Good	Fair	Yes	Direct Impact	-117.964	34.14383
91	*Persea americana*	Avocado	11	11	0	0	0	0	30	20	Good	Fair		Direct Impact	-117.964	34.14387
92	*Persea americana*	Avocado	11	11	0	0	0	0	35	12	Dead	Dead		Remove - Health	-117.964	34.1439
93	*Persea americana*	Avocado	11	11	0	0	0	0	30	28	Poor	Poor		Remove - Health	-117.964	34.14388
94	*Persea americana*	Avocado	11	11	0	0	0	0	20	12	Poor	Poor		Remove - Health	-117.964	34.14391
95	*Persea americana*	Avocado	13	13	0	0	0	0	35	25	Poor	Poor		Remove - Health	-117.964	34.14395
96	*Persea americana*	Avocado	13	13	0	0	0	0	30	25	Poor	Poor		Remove - Health	-117.964	34.14399
97	*Persea americana*	Avocado	12	12	0	0	0	0	30	25	Poor	Poor		Remove - Health	-117.964	34.14402
98	*Quercus agrifolia*	Coast live oak	8	8	0	0	0	0	14	18	Fair	Fair		Direct Impact	-117.964	34.14383
99	*Persea americana*	Avocado	8.485281	6	6	0	0	0	14	18	Dead	Dead		Remove - Health	-117.964	34.14382
100	*Eucalyptus globulus*	Blue gum	60	60	0	0	0	0	70	55	Fair	Fair		Encroachment	-117.964	34.14391
101	*Fraxinus uhdei*	Shamel ash	12	12	0	0	0	0	50	35	Fair	Fair		Encroachment	-117.964	34.14435
102	*Brachychiton acerfolius*	Flame tree	10	10	0	0	0	0	18	13	Good	Fair		Direct Impact	-117.964	34.14446
103	*Populus fremontii*	Western cottonwood	20	20	0	0	0	0	35	30	Good	Fair		Direct Impact	-117.964	34.1445
104	*Quercus agrifolia*	Coast live oak	24.08319	18	16	0	0	0	50	45	Good	Fair		Direct Impact	-117.964	34.14462
105	*Quercus agrifolia*	Coast live oak	15.81139	13	9	0	0	0	35	40	Good	Fair		Direct Impact	-117.964	34.14471
106	*Quercus suber*	Cork oak	15	15	0	0	0	0	35	30	Good	Fair		Direct Impact	-117.964	34.14476
107	*Quercus suber*	Cork oak	35	35	0	0	0	0	40	35	Good	Fair		Direct Impact	-117.964	34.1448
108	*Persea americana*	Avocado	25.45584	18	18	0	0	0	35	35	Good	Fair		Direct Impact	-117.964	34.14491
109	*Citrus aurantifolia*	Lime	5.196152	3	3	2	2	1	12	14	Good	Fair		Direct Impact	-117.964	34.14489
110	*Citrus aurantifolia*	Lime	6.557439	5	3	2	2	1	12	14	Fair	Fair		Direct Impact	-117.964	34.1449
111	*Persea americana*	Avocado	8	8	0	0	0	0	16	14	Fair	Fair		Direct Impact	-117.964	34.14486
112	*Quercus agrifolia*	Coast live oak	8	8	0	0	0	0	20	15	Fair	Fair		Direct Impact	-117.964	34.14486
113	*Quercus agrifolia*	Coast live oak	5.385165	4	3	2	0	0	20	10	Fair	Fair		Direct Impact	-117.964	34.14485
114	*Grevillea robusta*	Silk oak	8	8	0	0	0	0	45	15	Fair	Fair		Direct Impact	-117.964	34.14483
115	*Persea americana*	Avocado	8	8	0	0	0	0	15	12	Dead	Dead		Remove - Health	-117.964	34.14484
116	*Quercus agrifolia*	Coast live oak	2	2	0	0	0	0	12	8	Good	Good	Yes	Direct Impact	-117.964	34.14486
117	*Persea americana*	Avocado	10.29563	9	5	0	0	0	28	20	Poor	Poor		Remove - Health	-117.964	34.14479

Appendix B - Tree Information Matrices - Royal Oaks Project																
				Individual Stem												
Tree #	Botanical Name	Common Name	Diameter (in.)	D1	D2	D3	D4	D5	Height (ft.)	Canopy (ft.)	Health	Structure	Relocation Potential	Impact Status	X	Y
118	*Persea americana*	Avocado	15	15	0	0	0	0	28	20	Dead	Dead		Remove - Health	-117.964	34.14485
119	*Quercus agrifolia*	Coast live oak	4	4	0	0	0	0	12	8	Fair	Fair		Direct Impact	-117.964	34.14488
120	*Quercus agrifolia*	Coast live oak	2	2	0	0	0	0	9	4	Fair	Fair		Direct Impact	-117.964	34.14488
121	*Persea americana*	Avocado	14.42221	12	8	0	0	0	14	10	Dead	Dead		Remove - Health	-117.964	34.14491
122	*Quercus agrifolia*	Coast live oak	4	4	0	0	0	0	15	10	Poor	Poor		Remove - Health	-117.964	34.14492
123	*Persea americana*	Avocado	9.219544	7	6	0	0	0	15	10	Dead	Dead		Remove - Health	-117.964	34.14485
124	*Quercus agrifolia*	Coast live oak	4.123106	4	1	0	0	0	14	12	Good	Fair	Yes	Direct Impact	-117.964	34.1449
125	*Quercus agrifolia*	Coast live oak	9	9	0	0	0	0	24	18	Fair	Fair		Direct Impact	-117.964	34.14488
126	*Ceratonia siliqua*	Carob	5	5	0	0	0	0	18	10	Fair	Fair		Direct Impact	-117.964	34.14485
127	*Fraxinus velutina*	Arizona ash	9	9	0	0	0	0	20	18	Poor	Fair		Remove - Health	-117.964	34.14489
128	*Quercus agrifolia*	Coast live oak	11	11	0	0	0	0	25	20	Fair	Fair		Direct Impact	-117.964	34.14485
129	*Persea americana*	Avocado	12.08305	11	5	0	0	0	30	28	Dead	Dead		Remove - Health	-117.964	34.14479
130	*Citrus x limon*	Lemon	4	4	0	0	0	0	12	10	Fair	Fair		Direct Impact	-117.964	34.14485
131	*Persea americana*	Avocado	9	9	0	0	0	0	20	12	Dead	Dead		Remove - Health	-117.964	34.1449
132	*Ulmus parvifolia*	Chinese elm	20.51829	12	14	9	0	0	50	30	Good	Fair		Direct Impact	-117.964	34.1449
133	*Quercus agrifolia*	Coast live oak	28	28	0	0	0	0	28	30	Good	Fair		Direct Impact	-117.964	34.14485
134	*Ficus edulis*	Fig	15.26434	9	8	4	6	6	28	30	Fair	Fair		Direct Impact	-117.964	34.14474
135	*Ficus edulis*	Fig	15.26434	9	8	4	6	6	28	30	Fair	Fair		Direct Impact	-117.964	34.14474
136	*Persea americana*	Avocado	12	12	0	0	0	0	28	20	Poor	Poor		Remove - Health	-117.964	34.14468
137	*Persea americana*	Avocado	15.6205	12	10	0	0	0	24	20	Poor	Poor		Remove - Health	-117.964	34.14468
138	*Persea americana*	Avocado	9	9	0	0	0	0	18	14	Poor	Poor		Remove - Health	-117.964	34.14468
139	*Persea americana*	Avocado	13.45362	10	9	0	0	0	18	14	Poor	Poor		Remove - Health	-117.964	34.14469
140	*Persea americana*	Avocado	16.40122	13	10	0	0	0	20	24	Poor	Poor		Remove - Health	-117.963	34.14467
141	*Quercus agrifolia*	Coast live oak	9	9	0	0	0	0	28	24	Good	Fair	Yes	Direct Impact	-117.963	34.14467
142	*Malus alba*	White mulberry	10.77033	10	4	0	0	0	22	20	Fair	Fair		Direct Impact	-117.963	34.14464
143	*Quercus agrifolia*	Coast live oak	3	3	0	0	0	0	10	8	Fair	Fair		Direct Impact	-117.964	34.14464
144	*Quercus agrifolia*	Coast live oak	14	14	0	0	0	0	28	24	Fair	Fair		Direct Impact	-117.964	34.14465
145	*Persea americana*	Avocado	11.18034	8	6	5	0	0	18	18	Dead	Dead		Remove - Health	-117.964	34.14462
146	*Persea americana*	Avocado	10	10	0	0	0	0	23	20	Dead	Dead		Remove - Health	-117.964	34.14462
147	*Persea americana*	Avocado	7.28011	7	2	0	0	0	20	15	Dead	Dead		Remove - Health	-117.964	34.14457
148	*Persea americana*	Avocado	13	13	0	0	0	0	20	25	Dead	Dead		Remove - Health	-117.964	34.14456
149	*Persea americana*	Avocado	13	13	0	0	0	0	25	25	Poor	Poor		Remove - Health	-117.964	34.14451
150	*Persea americana*	Avocado	10.29563	9	5	0	0	0	20	16	Poor	Poor		Remove - Health	-117.964	34.14451
151	*Persea americana*	Avocado	8.485281	6	6	0	0	0	12	12	Poor	Poor		Remove - Health	-117.964	34.14456
152	*Persea americana*	Avocado	9	9	0	0	0	0	22	18	Poor	Poor		Remove - Health	-117.964	34.14453
153	*Quercus agrifolia*	Coast live oak	13	13	0	0	0	0	25	25	Fair	Fair		Direct Impact	-117.964	34.14457
154	*Quercus agrifolia*	Coast live oak	14	14	0	0	0	0	25	25	Fair	Fair		Direct Impact	-117.963	34.14451
155	*Fraxinus velutina*	Arizona ash	7.211103	6	4	0	0	0	25	16	Fair	Fair		Direct Impact	-117.963	34.14451
156	*Quercus agrifolia*	Coast live oak	5	5	0	0	0	0	16	10	Fair	Fair		Direct Impact	-117.964	34.14454

Appendix B - Tree Information Matrices - Royal Oaks Project

				Individual Stem												
Tree #	Botanical Name	Common Name	Diameter (in.)	D1	D2	D3	D4	D5	Height (ft.)	Canopy (ft.)	Health	Structure	Relocation Potential	Impact Status	X	Y
157	*Persea americana*	Avocado	13.85641	8	8	8	0	0	20	20	Poor	Poor		Remove - Health	-117.964	34.14452
158	*Persea americana*	Avocado	13.45362	10	9	0	0	0	18	18	Poor	Poor		Remove - Health	-117.964	34.14446
159	*Persea americana*	Avocado	9	9	0	0	0	0	15	10	Dead	Dead		Remove - Health	-117.964	34.14446
160	*Persea americana*	Avocado	10	10	0	0	0	0	18	14	Poor	Poor		Remove - Health	-117.964	34.14446
161	*Quercus agrifolia*	Coast live oak	6	6	0	0	0	0	18	14	Fair	Fair		Direct Impact	-117.964	34.14445
162	*Persea americana*	Avocado	13.45362	9	8	6	0	0	22	20	Dead	Dead		Remove - Health	-117.964	34.14445
163	*Persea americana*	Avocado	10.81665	9	6	0	0	0	22	15	Poor	Poor		Remove - Health	-117.963	34.14447
164	*Quercus agrifolia*	Coast live oak	12	12	0	0	0	0	35	30	Fair	Fair		Direct Impact	-117.963	34.14447
165	*Persea americana*	Avocado	9.899495	7	7	0	0	0	10	8	Poor	Fair		Remove - Health	-117.963	34.14446
166	*Persea americana*	Avocado	12	12	0	0	0	0	25	16	Poor	Fair		Remove - Health	-117.963	34.14451
167	*Quercus agrifolia*	Coast live oak	15	15	0	0	0	0	30	25	Fair	Fair		Direct Impact	-117.963	34.14457
168	*Fraxinus velutina*	Arizona ash	9	9	0	0	0	0	45	30	Fair	Fair		Direct Impact	-117.963	34.14462
169	*Sambucus mexicana*	Mexican elderberry	11.61895	7	6	5	5	0	15	15	Fair	Fair		Direct Impact	-117.963	34.14462
170	*Fraxinus velutina*	Arizona ash	9	9	0	0	0	0	40	30	Fair	Fair		Direct Impact	-117.963	34.14465
171	*Persea americana*	Avocado	19	19	0	0	0	0	10	10	Dead	Dead		Remove - Health	-117.963	34.14466
172	*Quercus agrifolia*	Coast live oak	22.51666	12	11	11	11	0	30	35	Fair	Fair		Direct Impact	-117.963	34.14471
173	*Quercus agrifolia*	Coast live oak	27.3313	17	16	11	9	0	35	35	Fair	Fair		Direct Impact	-117.963	34.14473
174	*Citrus aurantifolia*	Lime	8.774964	6	4	4	3	0	16	16	Fair	Fair		Direct Impact	-117.963	34.14467
175	*Quercus agrifolia*	Coast live oak	15	15	0	0	0	0	30	30	Fair	Fair		Direct Impact	-117.963	34.14467
176	*Quercus agrifolia*	Coast live oak	18.02776	15	8	6	0	0	30	25	Poor	Fair		Remove - Health	-117.963	34.14462
177	*Quercus agrifolia*	Coast live oak	9	9	0	0	0	0	35	25	Fair	Fair		Direct Impact	-117.963	34.14483
178	*Persea americana*	Avocado	17	17	0	0	0	0	30	30	Poor	Poor		Remove - Health	-117.963	34.14486
179	*Quercus agrifolia*	Coast live oak	14.86607	11	10	0	0	0	25	20	Fair	Fair		Direct Impact	-117.963	34.14488
180	*Quercus agrifolia*	Coast live oak	13.45362	10	9	0	0	0	18	20	Fair	Fair		Direct Impact	-117.963	34.14488
181	*Quercus agrifolia*	Coast live oak	13	13	0	0	0	0	30	25	Fair	Fair		Direct Impact	-117.963	34.14467
182	*Citrus aurantifolia*	Lime	10.81665	7	6	4	4	0	18	18	Fair	Fair		Direct Impact	-117.963	34.14462
183	*Persea americana*	Avocado	8.944272	8	4	0	0	0	16	16	Poor	Poor		Remove - Health	-117.963	34.14461
184	*Citrus aurantifolia*	Lime	8.246211	5	4	3	3	3	10	10	Fair	Fair		Direct Impact	-117.963	34.14457
185	*Quercus agrifolia*	Coast live oak	16	16	0	0	0	0	35	30	Fair	Fair		Direct Impact	-117.963	34.14441
186	*Citrus x limon*	Lemon	5	4	3	0	0	0	10	6	Poor	Poor		Remove - Health	-117.963	34.14439
187	*Persea americana*	Avocado	7	7	0	0	0	0	10	6	Dead	Dead		Remove - Health	-117.963	34.14429
188	*Malus alba*	White mulberry	11	7	6	6	0	0	25	25	Poor	Poor		Remove - Health	-117.963	34.14428
189	*Persea americana*	Avocado	10.24695	7	6	2	4	0	10	14	Poor	Poor		Remove - Health	-117.963	34.1444
190	*Persea americana*	Avocado	9	9	0	0	0	0	12	8	Poor	Poor		Remove - Health	-117.963	34.14439
191	*Persea americana*	Avocado	11.6619	8	6	6	0	0	18	18	Poor	Poor		Remove - Health	-117.963	34.1444
192	*Persea americana*	Avocado	12.64911	12	4	0	0	0	16	15	Poor	Poor		Remove - Health	-117.963	34.1444
193	*Persea americana*	Avocado	9.848858	9	4	0	0	0	18	16	Poor	Poor		Remove - Health	-117.963	34.1444
194	*Persea americana*	Avocado	11.40175	9	7	0	0	0	18	16	Dead	Dead		Remove - Health	-117.964	34.14439
195	*Persea americana*	Avocado	12.36932	11	4	4	0	0	25	18	Poor	Poor		Remove - Health	-117.964	34.14439

Appendix B - Tree Information Matrices - Royal Oaks Project

				Individual Stem												
Tree #	Botanical Name	Common Name	Diameter (in.)	D1	D2	D3	D4	D5	Height (ft.)	Canopy (ft.)	Health	Structure	Relocation Potential	Impact Status	X	Y
196	*Persea americana*	Avocado	12	12	0	0	0	0	20	18	Poor	Poor		Remove - Health	-117.964	34.14439
197	*Pinus pinea*	Stone pine	18.30301	13	9	6	7	0	20	25	Fair	Fair		Direct Impact	-117.964	34.14442
198	*Fraxinus velutina*	Arizona ash	7	7	0	0	0	0	35	20	Fair	Fair			-117.963	34.14385
199	*Quercus agrifolia*	Coast live oak	16	16	0	0	0	0	35	35	Fair	Fair			-117.963	34.14389
200	*Persea americana*	Avocado	15	15	0	0	0	0	25	30	Fair	Fair			-117.963	34.14384
201	*Ulmus parvifolia*	Chinese elm	9.899495	7	7	0	0	0	14	16	Fair	Poor			-117.963	34.14385
202	*Persea americana*	Avocado	11	11	0	0	0	0	30	16	Poor	Poor		Remove - Health	-117.963	34.14384
203	*Persea americana*	Avocado	13	13	0	0	0	0	25	25	Poor	Poor		Remove - Health	-117.963	34.14384
204	*Persea americana*	Avocado	12.80625	9	7	3	5	0	20	25	Poor	Poor		Remove - Health	-117.963	34.14384
205	*Persea americana*	Avocado	18.60108	12	11	9	0	0	25	25	Poor	Poor		Remove - Health	-117.963	34.14384
206	*Persea americana*	Avocado	12.8841	9	6	7	0	0	20	20	Poor	Poor		Remove - Health	-117.963	34.14385
207	*Quercus agrifolia*	Coast live oak	17	17	0	0	0	0	35	30	Fair	Fair			-117.963	34.14385
208	*Quercus agrifolia*	Coast live oak	4.472136	4	2	0	0	0	12	6	Fair	Fair			-117.963	34.14384
209	*Ulmus parvifolia*	Chinese elm	12.0416	8	9	0	0	0	25	25	Fair	Fair			-117.962	34.14385
210	*Quercus agrifolia*	Coast live oak	12.0416	8	9	0	0	0	16	25	Dead	Dead		Remove - Health	-117.962	34.14385
211	*Ceratonia siliqua*	Carob	5	5	0	0	0	0	30	14	Fair	Fair			-117.962	34.14383
212	*Persea americana*	Avocado	8	8	0	0	0	0	15	15	Dead	Dead		Remove - Health	-117.962	34.1439
213	*Persea americana*	Avocado	8.246211	8	2	0	0	0	15	15	Dead	Dead		Remove - Health	-117.962	34.1439
214	*Persea americana*	Avocado	9	9	0	0	0	0	15	15	Poor	Poor		Remove - Health	-117.963	34.14389
215	*Quercus agrifolia*	Coast live oak	4	4	0	0	0	0	12	8	Fair	Fair			-117.963	34.1439
216	*Persea americana*	Avocado	11.31371	8	8	0	0	0	16	16	Dead	Dead		Remove - Health	-117.963	34.1439
217	*Quercus agrifolia*	Coast live oak	6	6	0	0	0	0	18	12	Fair	Fair			-117.963	34.14388
218	*Persea americana*	Avocado	13.60147	11	8	0	0	0	22	20	Poor	Poor		Remove - Health	-117.963	34.14389
219	*Persea americana*	Avocado	10	10	0	0	0	0	12	8	Dead	Dead		Remove - Health	-117.963	34.14389
220	*Persea americana*	Avocado	12	12	0	0	0	0	25	20	Poor	Poor		Remove - Health	-117.963	34.14389
221	*Fraxinus velutina*	Arizona ash	6	6	0	0	0	0	18	10	Fair	Fair			-117.963	34.14395
222	*Persea americana*	Avocado	15.81139	13	9	0	0	0	25	20	Dead	Dead		Remove - Health	-117.963	34.14395
223	*Persea americana*	Avocado	13	13	0	0	0	0	25	20	Poor	Poor		Remove - Health	-117.963	34.14395
224	*Persea americana*	Avocado	8	8	0	0	0	0	18	16	Dead	Dead		Remove - Health	-117.963	34.14395
225	*Persea americana*	Avocado	10	8	6	0	0	0	18	16	Poor	Poor		Remove - Health	-117.963	34.14394
226	*Persea americana*	Avocado	17.20465	14	6	8	0	0	25	20	Dead	Dead		Remove - Health	-117.963	34.14394
227	*Ulmus parvifolia*	Chinese elm	11	11	0	0	0	0	25	20	Poor	Poor		Remove - Health	-117.963	34.14395
228	*Quercus agrifolia*	Coast live oak	6	6	0	0	0	0	25	16	Fair	Fair			-117.963	34.14396
229	*Fraxinus velutina*	Arizona ash	2	2	0	0	0	0	18	6	Poor	Fair		Remove - Health	-117.963	34.14396
230	*Sambucus mexicana*	Mexican elderberry	8.485281	6	6	0	0	0	25	12	Dead	Dead		Remove - Health	-117.962	34.14393
231	*Ulmus parvifolia*	Chinese elm	8	8	0	0	0	0	25	18	Dead	Dead		Remove - Health	-117.962	34.14397
232	*Schinus terebinthifolius*	Brazillian pepper	8	8	0	0	0	0	25	18	Fair	Fair			-117.962	34.14401
233	*Grevillea robusta*	Silk oak	13	13	0	0	0	0	45	25	Fair	Fair			-117.962	34.144
234	*Quercus agrifolia*	Coast live oak	9.899495	7	7	0	0	0	12	15	Dead	Dead		Remove - Health	-117.962	34.144

Appendix B - Tree Information Matrices - Royal Oaks Project																
				Individual Stem												
Tree #	Botanical Name	Common Name	Diameter (in.)	D1	D2	D3	D4	D5	Height (ft.)	Canopy (ft.)	Health	Structure	Relocation Potential	Impact Status	X	Y
235	*Fraxinus velutina*	Arizona ash	6	6	0	0	0	0	35	20	Poor	Fair		Remove - Health	-117.963	34.144
236	*Fraxinus velutina*	Arizona ash	7	7	0	0	0	0	35	20	Poor	Fair		Remove - Health	-117.963	34.14399
237	*Ceratonia siliqua*	Carob	6	6	0	0	0	0	20	16	Fair	Fair			-117.963	34.14398
238	*Ficus edulis*	Fig	13.0767	7	6	6	5	5	35	25	Fair	Fair			-117.963	34.144
239	*Ulmus parvifolia*	Chinese elm	7	7	0	0	0	0	25	25	Fair	Poor			-117.963	34.14402
240	*Persea americana*	Avocado	15.81139	13	9	0	0	0	20	25	Poor	Poor		Remove - Health	-117.963	34.14401
241	*Persea americana*	Avocado	13	13	0	0	0	0	25	25	Poor	Poor		Remove - Health	-117.963	34.144
242	*Persea americana*	Avocado	12.0416	9	8	0	0	0	25	20	Poor	Poor		Remove - Health	-117.963	34.14405
243	*Persea americana*	Avocado	14.42221	12	8	0	0	0	25	20	Poor	Poor		Remove - Health	-117.963	34.14405
244	*Persea americana*	Avocado	15.6205	12	10	0	0	0	25	20	Poor	Poor		Remove - Health	-117.963	34.14405
245	*Persea americana*	Avocado	11	11	0	0	0	0	25	20	Dead	Dead		Remove - Health	-117.963	34.14405
246	*Persea americana*	Avocado	11	11	0	0	0	0	25	20	Dead	Dead		Remove - Health	-117.963	34.14405
247	*Fraxinus velutina*	Arizona ash	6	6	0	0	0	0	35	16	Fair	Fair			-117.963	34.14405
248	*Persea americana*	Avocado	14.59452	8	8	7	6	0	20	16	Poor	Poor		Remove - Health	-117.963	34.14406
249	*Persea americana*	Avocado	12.0416	9	8	0	0	0	20	16	Poor	Poor		Remove - Health	-117.962	34.14405
250	*Persea americana*	Avocado	9	9	0	0	0	0	20	16	Poor	Poor		Remove - Health	-117.962	34.14406
251	*Persea americana*	Avocado	15	9	12	0	0	0	20	16	Poor	Poor		Remove - Health	-117.962	34.14412
252	*Persea americana*	Avocado	12.72792	9	9	0	0	0	25	16	Poor	Poor		Remove - Health	-117.963	34.14412
253	*Quercus agrifolia*	Coast live oak	9	9	0	0	0	0	25	16	Fair	Fair			-117.963	34.14414
254	*Persea americana*	Avocado	9	9	0	0	0	0	18	16	Poor	Poor		Remove - Health	-117.963	34.14412
255	*Quercus agrifolia*	Coast live oak	6	6	0	0	0	0	18	12	Dead	Dead		Remove - Health	-117.963	34.14424
256	*Koelreuteria bipinnata*	Chinese flame tree	6	6	0	0	0	0	18	12	Fair	Poor		Encroachment	-117.963	34.14426
257	*Persea americana*	Avocado	9	9	0	0	0	0	20	12	Dead	Dead		Remove - Health	-117.963	34.14418
258	*Persea americana*	Avocado	10	8	6	0	0	0	15	10	Dead	Dead		Remove - Health	-117.963	34.14418
259	*Quercus agrifolia*	Coast live oak	7	7	0	0	0	0	18	10	Fair	Fair			-117.963	34.14421
260	*Quercus agrifolia*	Coast live oak	6	6	0	0	0	0	18	12	Fair	Fair			-117.962	34.14422
261	*Quercus agrifolia*	Coast live oak	4	4	0	0	0	0	15	8	Fair	Fair			-117.962	34.14419
262	*Fraxinus velutina*	Arizona ash	8	8	0	0	0	0	28	20	Poor	Poor		Remove - Health	-117.962	34.14413
263	*Ulmus parvifolia*	Chinese elm	7.681146	4	4	3	3	3	18	22	Fair	Fair		Encroachment	-117.962	34.14429
264	*Ulmus parvifolia*	Chinese elm	14.21267	11	9	0	0	0	24	22	Fair	Fair		Direct Impact	-117.963	34.14435
265	*Persea americana*	Avocado	9.486833	9	3	0	0	0	13	12	Dead	Dead		Remove - Health	-117.963	34.14446
266	*Persea americana*	Avocado	10.44031	10	3	0	0	0	13	12	Dead	Dead		Remove - Health	-117.962	34.14439
267	*Fraxinus velutina*	Arizona ash	4.242641	3	3	0	0	0	16	8	Poor	Poor		Remove - Health	-117.962	34.14433
268	*Quercus agrifolia*	Coast live oak	6.403124	4	5	0	0	0	17	12	Poor	Poor		Remove - Health	-117.962	34.14436
269	*Persea americana*	Avocado	15.06652	11	9	5	0	0	15	18	Dead	Dead		Remove - Health	-117.962	34.14439
270	*Persea americana*	Avocado	9.219544	7	6	0	0	0	15	18	Dead	Dead		Remove - Health	-117.962	34.14439
271	*Quercus agrifolia*	Coast live oak	3	3	0	0	0	0	10	8	Good	Fair	Yes	Direct Impact	-117.962	34.14442
272	*Persea americana*	Avocado	8.944272	4	8	0	0	0	10	12	Dead	Dead		Remove - Health	-117.962	34.14445
273	*Persea americana*	Avocado	9.219544	6	7	0	0	0	10	12	Dead	Dead		Remove - Health	-117.962	34.14445

Appendix B - Tree Information Matrices - Royal Oaks Project																
				Individual Stem												
Tree #	Botanical Name	Common Name	Diameter (in.)	D1	D2	D3	D4	D5	Height (ft.)	Canopy (ft.)	Health	Structure	Relocation Potential	Impact Status	X	Y
274	*Citrus aurantifolia*	Lime	7.81025	6	5	0	0	0	16	18	Good	Fair		Direct Impact	-117.963	34.14452
275	*Persea americana*	Avocado	11.35782	7	8	4	0	0	18	18	Fair	Fair		Direct Impact	-117.962	34.14449
276	*Quercus agrifolia*	Coast live oak	12.52996	11	6	0	0	0	24	25	Fair	Fair		Direct Impact	-117.962	34.14452
277	*Quercus agrifolia*	Coast live oak	10	10	0	0	0	0	20	18	Good	Fair	Yes	Direct Impact	-117.962	34.1445
278	*Quercus agrifolia*	Coast live oak	6	6	0	0	0	0	18	10	Good	Fair	Yes	Direct Impact	-117.962	34.14451
279	*Quercus agrifolia*	Coast live oak	4.123106	4	1	0	0	0	12	8	Good	Fair	Yes	Direct Impact	-117.962	34.14452
280	*Citrus aurantifolia*	Lime	9.219544	7	6	0	0	0	12	14	Good	Fair		Direct Impact	-117.962	34.14458
281	*Persea americana*	Avocado	11	11	0	0	0	0	14	14	Poor	Poor		Remove - Health	-117.963	34.14459
282	*Persea americana*	Avocado	5	4	3	0	0	0	13	12	Fair	Fair		Direct Impact	-117.962	34.14462
283	*Quercus agrifolia*	Coast live oak	5.830952	5	3	0	0	0	15	12	Fair	Fair		Direct Impact	-117.962	34.14465
284	*Persea americana*	Avocado	17.69181	13	12	0	0	0	14	15	Poor	Poor		Remove - Health	-117.962	34.14468
285	*Quercus agrifolia*	Coast live oak	32	32	0	0	0	0	40	40	Good	Fair		Direct Impact	-117.962	34.1447
286	*Quercus agrifolia*	Coast live oak	9	9	0	0	0	0	20	18	Good	Fair	Yes	Direct Impact	-117.962	34.14471
287	*Quercus agrifolia*	Coast live oak	4	4	0	0	0	0	12	8	Good	Fair	Yes	Direct Impact	-117.962	34.14473
288	*Quercus agrifolia*	Coast live oak	2.236068	2	1	0	0	0	10	6	Good	Fair	Yes	Direct Impact	-117.962	34.14474
289	*Quercus agrifolia*	Coast live oak	18	18	0	0	0	0	35	35	Fair	Fair		Direct Impact	-117.962	34.14473
290	*Persea americana*	Avocado	22.80351	18	14	0	0	0	40	40	Poor	Fair		Remove - Health	-117.962	34.14479
291	*Grevillea robusta*	Silk oak	7	7	0	0	0	0	50	20	Fair	Fair		Direct Impact	-117.962	34.14478
292	*Persea americana*	Avocado	16	16	0	0	0	0	45	30	Fair	Fair		Direct Impact	-117.962	34.14479
293	*Quercus agrifolia*	Coast live oak	14	14	0	0	0	0	45	40	Poor	Fair		Remove - Health	-117.962	34.14481
294	*Quercus agrifolia*	Coast live oak	1	1	0	0	0	0	50	40	Fair	Fair		Direct Impact	-117.962	34.14483
295	*Persea americana*	Avocado	14	14	0	0	0	0	20	14	Dead	Dead		Direct Impact	-117.962	34.14486
296	*Ulmus parvifolia*	Chinese elm	7.211103	6	4	0	0	0	35	14	Fair	Fair		Direct Impact	-117.962	34.1449
297	*Ulmus parvifolia*	Chinese elm	13	13	0	0	0	0	38	24	Fair	Fair		Direct Impact	-117.962	34.14491
298	*Quercus agrifolia*	Coast live oak	2	2	0	0	0	0	12	8	Dead	Dead		Remove - Health	-117.962	34.14489
299	*Quercus agrifolia*	Coast live oak	2	2	0	0	0	0	12	8	Fair	Fair		Direct Impact	-117.962	34.14489
300	*Quercus agrifolia*	Coast live oak	3	3	0	0	0	0	12	8	Fair	Fair		Direct Impact	-117.962	34.14487
301	*Quercus agrifolia*	Coast live oak	3	3	0	0	0	0	12	8	Fair	Fair		Direct Impact	-117.962	34.14488
302	*Quercus agrifolia*	Coast live oak	2	2	0	0	0	0	10	7	Fair	Fair		Direct Impact	-117.962	34.14489
303	*Quercus agrifolia*	Coast live oak	4	4	0	0	0	0	14	7	Fair	Fair		Direct Impact	-117.962	34.1449
304	*Quercus agrifolia*	Coast live oak	3	3	0	0	0	0	14	7	Fair	Fair		Direct Impact	-117.962	34.14489
305	*Quercus agrifolia*	Coast live oak	1	1	0	0	0	0	10	6	Fair	Fair		Direct Impact	-117.962	34.14487
306	*Quercus agrifolia*	Coast live oak	1	1	0	0	0	0	10	6	Fair	Fair		Direct Impact	-117.962	34.14488
307	*Quercus agrifolia*	Coast live oak	1	1	0	0	0	0	10	6	Fair	Fair		Direct Impact	-117.962	34.14488
308	*Quercus agrifolia*	Coast live oak	11	6	6	7	0	0	15	23	Fair	Fair		Direct Impact	-117.962	34.14493
309	*Quercus agrifolia*	Coast live oak	9.273618	5	6	5	0	0	18	23	Fair	Fair		Direct Impact	-117.962	34.14498
310	*Quercus agrifolia*	Coast live oak	8.602325	7	5	0	0	0	18	18	Fair	Fair		Encroachment	-117.962	34.14501
311	*Quercus agrifolia*	Coast live oak	2	2	0	0	0	0	14	10	Fair	Fair		Direct Impact	-117.962	34.14484
311	*Quercus agrifolia*	Coast live oak	6.403124	5	4	0	0	0	18	15	Fair	Fair		Direct Impact	-117.962	34.14498

Appendix B - Tree Information Matrices - Royal Oaks Project																
				Individual Stem												
Tree #	Botanical Name	Common Name	Diameter (in.)	D1	D2	D3	D4	D5	Height (ft.)	Canopy (ft.)	Health	Structure	Relocation Potential	Impact Status	X	Y
312	*Quercus agrifolia*	Coast live oak	15	15	0	0	0	0	35	30	Fair	Fair			-117.962	34.14509
313	*Quercus agrifolia*	Coast live oak	25	25	0	0	0	0	40	45	Fair	Fair			-117.962	34.14511
314	*Quercus agrifolia*	Coast live oak	28	28	0	0	0	0	0	35	Fair	Fair		Direct Impact	-117.964	34.14497
315	*contophoenix alexandr*	King palm	11	11	0	0	0	0	30	16	Fair	Fair		Direct Impact	-117.964	34.14495
316	*Quercus agrifolia*	Coast live oak	20	20	0	0	0	0	30	30	Fair	Fair		Direct Impact	-117.964	34.14497
317	*contophoenix alexandr*	King palm	14	14	0	0	0	0	28	12	Fair	Fair		Direct Impact	-117.964	34.14495
318	*Quercus agrifolia*	Coast live oak	15.6205	12	10	0	0	0	28	25	Fair	Fair		Direct Impact	-117.964	34.14497
319	*contophoenix alexandr*	King palm	10	10	0	0	0	0	40	12	Fair	Fair		Direct Impact	-117.964	34.14495
320	*Ulmus parvifolia*	Chinese elm	7.211103	6	4	0	0	0	25	18	Fair	Fair		Direct Impact	-117.964	34.14495
321	*contophoenix alexandr*	King palm	12	12	0	0	0	0	28	12	Fair	Fair		Direct Impact	-117.964	34.14495
322	*contophoenix alexandr*	King palm	12	12	0	0	0	0	28	14	Fair	Fair		Direct Impact	-117.964	34.14493
323	*Tipuana tipu*	Tipu	8	8	0	0	0	0	30	23	Fair	Fair		Direct Impact	-117.964	34.14496
324	*Tipuana tipu*	Tipu	9	9	0	0	0	0	35	30	Fair	Fair		Direct Impact	-117.964	34.14498
325	*Quercus agrifolia*	Coast live oak	6	6	0	0	0	0	20	15	Fair	Fair		Encroachment	-117.964	34.145
326	*Quercus engelmannii*	Englemann oak	17	17	0	0	0	0	40	35	Fair	Fair		Encroachment	-117.963	34.14503
327	*Quercus engelmannii*	Englemann oak	19	19	0	0	0	0	40	35	Fair	Fair		Encroachment	-117.963	34.145
328	*Quercus agrifolia*	Coast live oak	22	22	0	0	0	0	40	40	Good	Fair			-117.963	34.14515
329	*Quercus agrifolia*	Coast live oak	14	14	0	0	0	0	16	22	Fair	Poor			-117.963	34.14516
330	*Quercus agrifolia*	Coast live oak	22	22	0	0	0	0	40	40	Good	Fair			-117.963	34.14517
331	*Quercus agrifolia*	Coast live oak	9	9	0	0	0	0	18	15	Good	Fair			-117.963	34.1452
332	*Quercus agrifolia*	Coast live oak	18	18	0	0	0	0	30	30	Good	Fair			-117.963	34.14531
333	*Quercus agrifolia*	Coast live oak	4	4	0	0	0	0	13	8	Poor	Fair		Remove - Health	-117.963	34.14528
334	*Sambucus mexicana*	Mexican elderberry	10	8	6	0	0	0	17	12	Fair	Fair			-117.963	34.14528
335	*Quercus agrifolia*	Coast live oak	12	12	0	0	0	0	27	22	Good	Fair			-117.964	34.14525
336	*Quercus agrifolia*	Coast live oak	14	14	0	0	0	0	27	22	Good	Fair			-117.964	34.14525
337	*Quercus agrifolia*	Coast live oak	15	15	0	0	0	0	30	30	Good	Fair			-117.964	34.14517
338	*Quercus agrifolia*	Coast live oak	18	18	0	0	0	0	28	20	Good	Fair			-117.964	34.14511
339	*Quercus agrifolia*	Coast live oak	6	6	0	0	0	0	20	12	Good	Fair			-117.964	34.14515
340	*Quercus agrifolia*	Coast live oak	9	9	0	0	0	0	16	12	Good	Fair			-117.964	34.14516
341	*Heteromoles arbutifolia*	Toyon	6	6	0	0	0	0	13	10	Good	Fair			-117.964	34.14521
342	*Quercus agrifolia*	Coast live oak	3.605551	2	3	0	0	0	13	8	Fair	Fair			-117.964	34.14518
343	*Quercus agrifolia*	Coast live oak	20.24846	17	11	0	0	0	28	30	Poor	Fair		Remove - Health	-117.964	34.14523
344	*Heteromoles arbutifolia*	Toyon	6	6	0	0	0	0	12	10	Good	Fair			-117.964	34.14528
345	*Quercus agrifolia*	Coast live oak	9.486833	9	3	0	0	0	20	18	Fair	Fair			-117.964	34.14527
346	*Quercus agrifolia*	Coast live oak	10.81665	9	6	0	0	0	20	12	Dead	Dead		Remove - Health	-117.964	34.14535
347	*Quercus agrifolia*	Coast live oak	11	11	0	0	0	0	30	20	Fair	Fair			-117.964	34.1454
348	*Quercus agrifolia*	Coast live oak	11.40175	9	7	0	0	0	30	20	Fair	Fair			-117.964	34.14545
349	*Quercus agrifolia*	Coast live oak	14	14	0	0	0	0	30	20	Fair	Fair			-117.964	34.14546
350	*Quercus agrifolia*	Coast live oak	14	14	0	0	0	0	30	20	Fair	Fair			-117.964	34.14547

Appendix B - Tree Information Matrices - Royal Oaks Project																
				Individual Stem												
Tree #	Botanical Name	Common Name	Diameter (in.)	D1	D2	D3	D4	D5	Height (ft.)	Canopy (ft.)	Health	Structure	Relocation Potential	Impact Status	X	Y
351	*Heteromoles arbutifolia*	Toyon	6	6	0	0	0	0	18	12	Fair	Fair			-117.964	34.14542
352	*Quercus agrifolia*	Coast live oak	19	19	0	0	0	0	28	24	Fair	Fair			-117.964	34.14538
353	*Quercus agrifolia*	Coast live oak	4	4	0	0	0	0	8	9	Fair	Fair			-117.964	34.14532
354	*Quercus agrifolia*	Coast live oak	5	5	0	0	0	0	14	12	Fair	Fair			-117.964	34.14531
355	*Quercus agrifolia*	Coast live oak	18	18	0	0	0	0	30	30	Fair	Fair			-117.964	34.14531
356	*Quercus agrifolia*	Coast live oak	3	3	0	0	0	0	12	10	Fair	Fair			-117.964	34.14528
357	*Quercus agrifolia*	Coast live oak	30	30	0	0	0	0	30	40	Fair	Fair			-117.964	34.14525
358	*Quercus agrifolia*	Coast live oak	6	6	0	0	0	0	18	12	Fair	Fair			-117.964	34.14525
359	*Quercus agrifolia*	Coast live oak	6	6	0	0	0	0	18	15	Fair	Fair			-117.964	34.14523
360	*Quercus agrifolia*	Coast live oak	16.27882	12	11	0	0	0	24	35	Fair	Fair			-117.964	34.14523
361	*Quercus agrifolia*	Coast live oak	12	12	0	0	0	0	20	20	Fair	Fair			-117.964	34.14527
362	*Quercus agrifolia*	Coast live oak	6	6	0	0	0	0	16	12	Fair	Fair			-117.964	34.14526
363	*Quercus agrifolia*	Coast live oak	13.45362	9	10	0	0	0	22	25	Fair	Fair			-117.964	34.14526
364	*Quercus agrifolia*	Coast live oak	10.81665	9	6	0	0	0	20	20	Fair	Fair			-117.964	34.14529
365	*Quercus agrifolia*	Coast live oak	11	11	0	0	0	0	18	12	Fair	Fair			-117.964	34.14528
366	*Sambucus mexicana*	Mexican elderberry	12	12	0	0	0	0	22	25	Fair	Fair			-117.964	34.14525
367	*Sambucus mexicana*	Mexican elderberry	11	11	0	0	0	0	22	25	Fair	Fair			-117.964	34.14524
368	*Quercus agrifolia*	Coast live oak	24	24	0	0	0	0	40	35	Fair	Fair			-117.964	34.14517
369	*Quercus agrifolia*	Coast live oak	10	10	0	0	0	0	25	20	Fair	Fair			-117.964	34.14516
370	*Quercus agrifolia*	Coast live oak	13	13	0	0	0	0	25	20	Fair	Fair			-117.964	34.14518
371	*Quercus agrifolia*	Coast live oak	15	15	0	0	0	0	25	24	Fair	Fair			-117.964	34.14516
372	*Quercus agrifolia*	Coast live oak	27	27	0	0	0	0	38	35	Fair	Fair		Encroachment	-117.964	34.14508
373	*Quercus agrifolia*	Coast live oak	13	13	0	0	0	0	15	30	Fair	Fair			-117.964	34.14519
374	*Quercus agrifolia*	Coast live oak	8	8	0	0	0	0	15	18	Fair	Fair			-117.964	34.14515
375	*Quercus agrifolia*	Coast live oak	5	5	0	0	0	0	15	14	Fair	Fair			-117.964	34.14517
376	*Quercus agrifolia*	Coast live oak	13	13	0	0	0	0	18	20	Poor	Fair		Remove - Health	-117.964	34.14516
377	*Quercus agrifolia*	Coast live oak	28	28	0	0	0	0	18	35	Poor	Poor		Remove - Health	-117.964	34.14514
378	*Quercus agrifolia*	Coast live oak	2.236068	2	1	0	0	0	10	8	Fair	Fair		Direct Impact	-117.964	34.14499
379	*Quercus agrifolia*	Coast live oak	2.236068	2	1	0	0	0	10	8	Fair	Fair		Direct Impact	-117.964	34.14497
380	*Quercus agrifolia*	Coast live oak	8	8	0	0	0	0	20	12	Fair	Fair		Encroachment	-117.964	34.14501
381	*Quercus agrifolia*	Coast live oak	3	3	0	0	0	0	12	10	Fair	Fair			-117.964	34.14509
382	*Quercus agrifolia*	Coast live oak	7	7	0	0	0	0	18	14	Fair	Fair			-117.964	34.14511
383	*Quercus agrifolia*	Coast live oak	11	11	0	0	0	0	24	18	Fair	Fair			-117.964	34.1451
384	*Quercus agrifolia*	Coast live oak	7	7	0	0	0	0	20	18	Fair	Fair			-117.964	34.14509
385	*Quercus agrifolia*	Coast live oak	10	10	0	0	0	0	20	22	Fair	Fair		Encroachment	-117.964	34.14508
386	*Quercus agrifolia*	Coast live oak	7.549834	4	4	3	4	0	20	18	Poor	Fair		Remove - Health	-117.964	34.14508
387	*Quercus agrifolia*	Coast live oak	14	14	0	0	0	0	20	22	Poor	Fair		Remove - Health	-117.964	34.14505
388	*Quercus agrifolia*	Coast live oak	5	5	0	0	0	0	12	14	Fair	Fair			-117.963	34.14541
389	*Quercus agrifolia*	Coast live oak	17.46425	16	7	0	0	0	25	25	Fair	Fair			-117.963	34.14543

Appendix B - Tree Information Matrices - Royal Oaks Project

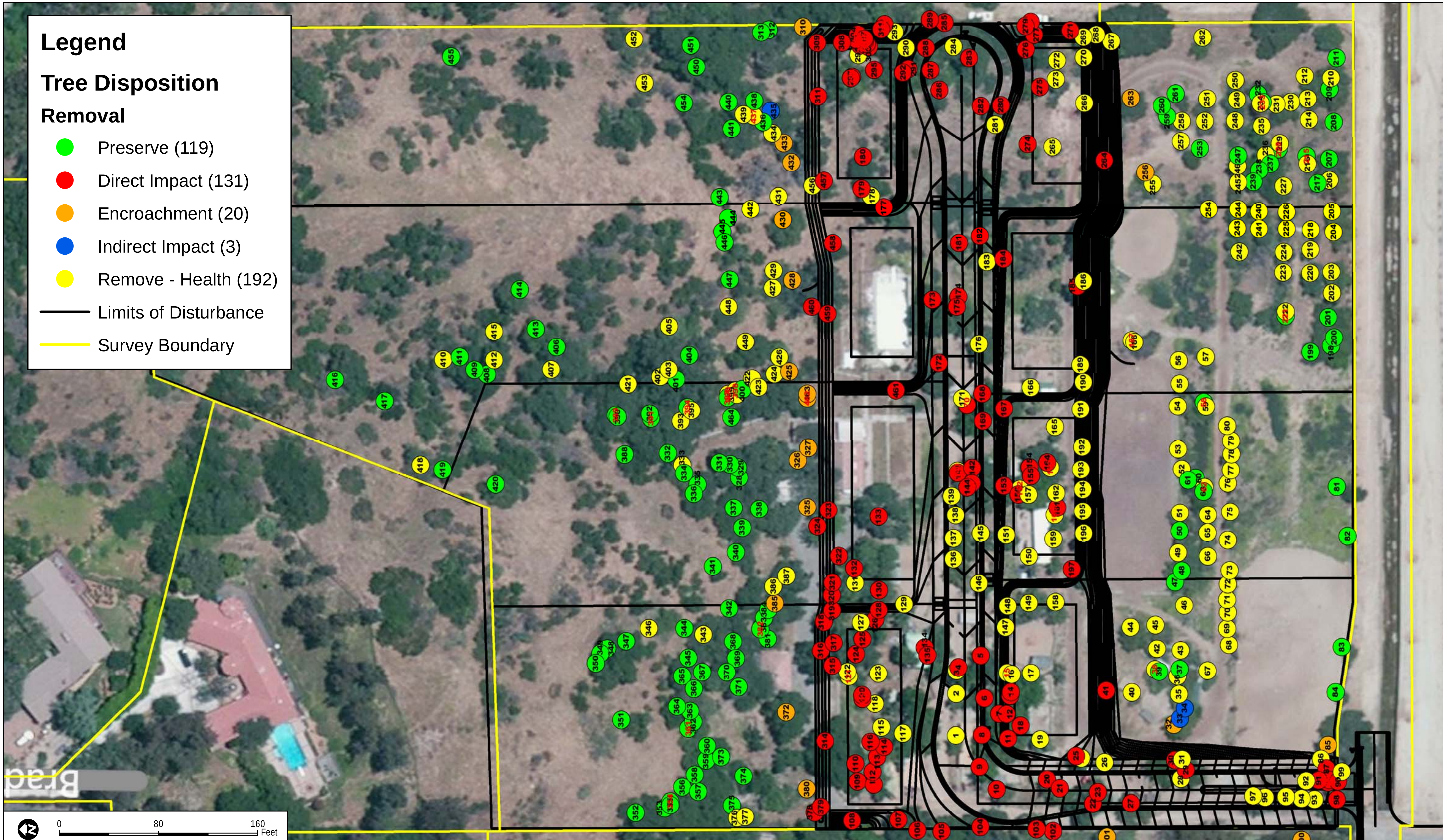
Tree #	Botanical Name	Common Name	Diameter (in.)	Individual Stem D1	D2	D3	D4	D5	Height (ft.)	Canopy (ft.)	Health	Structure	Relocation Potential	Impact Status	X	Y
390	*Quercus agrifolia*	Coast live oak	17.49286	15	9	0	0	0	35	30	Fair	Fair			-117.963	34.14542
391	*Quercus agrifolia*	Coast live oak	15	15	0	0	0	0	35	30	Fair	Fair			-117.963	34.14535
392	*Quercus agrifolia*	Coast live oak	19	19	0	0	0	0	35	35	Fair	Fair			-117.963	34.14535
393	*Quercus agrifolia*	Coast live oak	9	9	0	0	0	0	25	20	Poor	Fair		Remove - Health	-117.963	34.14528
394	*Quercus agrifolia*	Coast live oak	14	14	0	0	0	0	25	20	Fair	Poor			-117.963	34.14527
395	*Quercus agrifolia*	Coast live oak	13	13	0	0	0	0	25	20	Poor	Poor		Remove - Health	-117.963	34.14526
396	*Quercus agrifolia*	Coast live oak	16	16	0	0	0	0	9	5	Poor	Poor		Remove - Health	-117.963	34.14518
397	*Quercus agrifolia*	Coast live oak	6	6	0	0	0	0	12	5	Fair	Poor			-117.963	34.14518
398	*Quercus agrifolia*	Coast live oak	8	8	0	0	0	0	20	16	Poor	Fair		Remove - Health	-117.963	34.14516
399	*Quercus agrifolia*	Coast live oak	7	7	0	0	0	0	12	12	Poor	Poor		Remove - Health	-117.963	34.14516
400	*Quercus agrifolia*	Coast live oak	15	15	0	0	0	0	25	25	Fair	Fair			-117.963	34.14515
401	*Quercus agrifolia*	Coast live oak	12	12	0	0	0	0	20	20	Fair	Fair			-117.963	34.14529
402	*Sambucus mexicana*	Mexican elderberry	7.874008	7	3	2	0	0	20	20	Poor	Poor		Remove - Health	-117.963	34.14533
403	*Quercus agrifolia*	Coast live oak	8	8	0	0	0	0	16	16	Poor	Poor		Remove - Health	-117.963	34.14531
404	*Quercus agrifolia*	Coast live oak	39.25557	28	26	9	0	0	45	65	Fair	Fair			-117.963	34.14526
405	*Sambucus mexicana*	Mexican elderberry	13.63818	8	8	7	3	0	22	22	Poor	Fair		Remove - Health	-117.963	34.14531
406	*Quercus agrifolia*	Coast live oak	17	17	0	0	0	0	35	35	Fair	Fair			-117.963	34.14556
407	*Quercus agrifolia*	Coast live oak	4	4	0	0	0	0	12	10	Poor	Poor		Remove - Health	-117.963	34.14557
408	*Quercus agrifolia*	Coast live oak	7.211103	6	4	0	0	0	16	16	Fair	Poor			-117.963	34.14571
409	*Quercus agrifolia*	Coast live oak	15	15	0	0	0	0	30	30	Fair	Fair			-117.963	34.14574
410	*Sambucus mexicana*	Mexican elderberry	6	6	0	0	0	0	20	16	Poor	Fair		Remove - Health	-117.963	34.14581
411	*Quercus agrifolia*	Coast live oak	13.30414	8	8	7	0	0	25	25	Fair	Fair			-117.963	34.14577
412	*Quercus agrifolia*	Coast live oak	16	16	0	0	0	0	35	35	Poor	Fair		Remove - Health	-117.963	34.1457
413	*Quercus agrifolia*	Coast live oak	17.69181	13	12	0	0	0	35	35	Fair	Fair			-117.963	34.1456
414	*Quercus agrifolia*	Coast live oak	13	13	0	0	0	0	25	25	Fair	Poor			-117.963	34.14564
415	*Sambucus mexicana*	Mexican elderberry	8.944272	8	4	0	0	0	20	16	Poor	Poor		Remove - Health	-117.963	34.1457
416	*Quercus agrifolia*	Coast live oak	20	20	0	0	0	0	40	35	Fair	Fair			-117.963	34.14605
417	*Rhus ovata*	Sumac	11.87434	8	6	4	5	0	22	30	Fair	Fair			-117.963	34.14594
418	*Quercus agrifolia*	Coast live oak	20.3224	13	12	10	0	0	35	40	Poor	Poor		Remove - Health	-117.963	34.14586
419	*Quercus agrifolia*	Coast live oak	15.65248	10	9	8	0	0	25	30	Fair	Fair			-117.963	34.14581
420	*Quercus agrifolia*	Coast live oak	18.81489	9	9	8	8	8	30	30	Fair	Fair			-117.964	34.14569
421	*Quercus agrifolia*	Coast live oak	6	6	0	0	0	0	15	10	Poor	Poor		Remove - Health	-117.963	34.1454
422	*Quercus agrifolia*	Coast live oak	9	9	0	0	0	0	20	20	Dead	Dead		Remove - Health	-117.963	34.14513
423	*Quercus agrifolia*	Coast live oak	10.63015	9	4	4	0	0	20	20	Poor	Poor		Remove - Health	-117.963	34.14511
424	*Quercus agrifolia*	Coast live oak	8	8	0	0	0	0	20	18	Poor	Poor		Remove - Health	-117.963	34.14508
425	*Quercus agrifolia*	Coast live oak	16.49242	16	4	0	0	0	35	35	Fair	Fair		Encroachment	-117.963	34.14504
426	*Quercus agrifolia*	Coast live oak	11.31371	8	8	0	0	0	16	16	Poor	Poor		Remove - Health	-117.963	34.14507
427	*Sambucus mexicana*	Mexican elderberry	11.31371	8	8	0	0	0	16	22	Poor	Poor		Remove - Health	-117.963	34.14508
428	*Quercus agrifolia*	Coast live oak	34.64102	20	20	20	0	0	50	55	Fair	Fair		Encroachment	-117.963	34.14504

Appendix B - Tree Information Matrices - Royal Oaks Project

Tree #	Botanical Name	Common Name	Diameter (in.)	Individual Stem D1	D2	D3	D4	D5	Height (ft.)	Canopy (ft.)	Health	Structure	Relocation Potential	Impact Status	X	Y
429	*Quercus agrifolia*	Coast live oak	15	15	0	0	0	0	30	25	Poor	Fair		Remove - Health	-117.963	34.14508
430	*Quercus agrifolia*	Coast live oak	16	16	0	0	0	0	35	35	Fair	Fair		Encroachment	-117.963	34.14506
431	*Quercus agrifolia*	Coast live oak	4.242641	3	3	0	0	0	8	6	Poor	Poor		Remove - Health	-117.963	34.14507
432	*Quercus agrifolia*	Coast live oak	9.899495	7	7	0	0	0	18	16	Fair	Poor		Encroachment	-117.963	34.14504
433	*Quercus agrifolia*	Coast live oak	10	10	0	0	0	0	25	25	Fair	Fair		Encroachment	-117.963	34.14506
434	*Quercus agrifolia*	Coast live oak	32	32	0	0	0	0	45	55	Poor	Fair		Remove - Health	-117.963	34.14508
435	*Quercus agrifolia*	Coast live oak	10	8	6	0	0	0	20	20	Fair	Fair		Indirect Impact	-117.963	34.14508
436	*Quercus agrifolia*	Coast live oak	7	7	0	0	0	0	20	16	Fair	Poor			-117.963	34.1451
437	*Quercus agrifolia*	Coast live oak	6	6	0	0	0	0	18	16	Poor	Poor		Remove - Health	-117.963	34.14512
438	*Quercus agrifolia*	Coast live oak	3.605551	2	3	0	0	0	12	12	Fair	Poor			-117.962	34.14512
439	*Quercus agrifolia*	Coast live oak	6	6	0	0	0	0	10	6	Poor	Poor		Remove - Health	-117.963	34.14514
440	*Quercus agrifolia*	Coast live oak	18	18	0	0	0	0	45	40	Fair	Fair			-117.962	34.14518
441	*Quercus agrifolia*	Coast live oak	17	17	0	0	0	0	35	35	Fair	Fair			-117.963	34.14517
442	*Quercus agrifolia*	Coast live oak	3	3	0	0	0	0	6	6	Dead	Dead		Remove - Health	-117.963	34.14513
443	*Rhus ovata*	Sumac	7	7	0	0	0	0	15	15	Fair	Fair			-117.963	34.1452
444	*Rhus ovata*	Sumac	6	6	0	0	0	0	15	15	Fair	Fair			-117.963	34.14518
445	*Rhus ovata*	Sumac	6	6	0	0	0	0	18	15	Fair	Fair			-117.963	34.14519
446	*Rhus ovata*	Sumac	8.774964	6	4	4	3	0	20	20	Fair	Fair			-117.963	34.14519
447	*Rhus ovata*	Sumac	8.062258	7	4	0	0	0	20	16	Fair	Fair			-117.963	34.14518
448	*Sambucus mexicana*	Mexican elderberry	10.63015	7	8	0	0	0	20	16	Poor	Fair		Remove - Health	-117.963	34.14518
449	*Quercus agrifolia*	Coast live oak	18.38478	13	12	5	0	0	35	35	Dead	Dead		Remove - Health	-117.963	34.14514
450	*Quercus agrifolia*	Coast live oak	13	13	0	0	0	0	30	30	Fair	Poor			-117.962	34.14525
451	*Quercus agrifolia*	Coast live oak	64.66065	55	34	0	0	0	55	70	Fair	Fair			-117.962	34.14526
452	*Quercus agrifolia*	Coast live oak	16	16	0	0	0	0	20	35	Poor	Poor		Remove - Health	-117.962	34.14539
453	*Quercus agrifolia*	Coast live oak	8.062258	7	4	0	0	0	25	20	Poor	Poor		Remove - Health	-117.962	34.14536
454	*Quercus agrifolia*	Coast live oak	15.06652	7	8	8	5	5	30	25	Fair	Fair			-117.962	34.14528
455	*Rhus ovata*	Sumac	11.40175	9	7	0	0	0	20	25	Fair	Poor			-117.962	34.14579
456	*Quercus agrifolia*	Coast live oak	4.123106	2	3	2	0	0	8	6	Poor	Poor		Remove - Health	-117.963	34.14499
457	*Quercus agrifolia*	Coast live oak	8	8	0	0	0	0	22	20	Fair	Fair		Direct Impact	-117.963	34.14497
458	*Quercus agrifolia*	Coast live oak	9.433981	8	5	0	0	0	18	20	Fair	Fair		Direct Impact	-117.963	34.14495
459	*Sambucus mexicana*	Mexican elderberry	13.92839	8	7	9	0	0	22	25	Fair	Fair		Direct Impact	-117.963	34.14496
460	*Quercus agrifolia*	Coast live oak	8	8	0	0	0	0	22	20	Fair	Fair		Direct Impact	-117.963	34.14499
461	*Ficus edulis*	Fig	9	9	0	0	0	0	22	20	Fair	Fair		Direct Impact	-117.963	34.14481
462	*Quercus agrifolia*	Coast live oak	13	13	0	0	0	0	30	20	Fair	Fair		Encroachment	-117.963	34.145
463	*Quercus agrifolia*	Coast live oak	4.690416	3	3	2	0	0	8	12	Fair	Fair		Encroachment	-117.963	34.145
464	*Quercus agrifolia*	Coast live oak	7.211103	6	4	0	0	0	12	12	Fair	Fair			-117.963	34.14517

APPENDIX C

Tree Impact Exhibit



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Appendix C

Tree Impact Exhibit

Royal Oaks Tree Preservation and Protection Plan

APPENDIX D

Tree Protection Measures

Appendix D – Tree Protection Measures

The following sections are included as general guidelines for tree protection from construction impacts. The measures presented should be monitored by arborists and enforced by contractors and developers for maximum benefit to the trees.

Tree Protection Measures Prior to Construction

Fencing: All remaining trees that will not be relocated or removed shall be preserved and protected in place. Trees within approximately 15 feet of proposed construction activity shall be temporarily fenced with chain link or other material satisfactory to City planning staff throughout grading and construction activities. The fencing shall be installed 3 feet outside of the dripline of each tree (or edge of canopy for cluster of trees), be 4 foot tall, and staked every 6 feet. The fenced area shall be considered the tree protection zone (TPZ) unless proximate construction required temporary removal.

Pre-Construction Meeting: A pre-construction meeting shall be held between all contractors (including grading, tree removal/pruning, builders, etc.) and the arborist. The arborist will instruct the contractors on tree protection practices and answer any questions. All equipment operators and spotters, assistants, or those directing operators from the ground, shall provide written acknowledgement of their receiving tree protection training. This training shall include information on the location and marking of protected trees, the necessity of preventing damage, and the discussion of work practices that will accomplish such.

Protection and Maintenance During Construction

Once construction activities have begun the following measures shall be adhered to:

Equipment Operation and Storage: Avoid heavy equipment operation around the trees. Operating heavy machinery around the root zones of trees will increase soil compaction, which decreases soil aeration and subsequently reduces water penetration in the soil. All heavy equipment and vehicles should, at minimum, stay out of the fenced tree protection zone, unless where specifically approved in writing and under the supervision of a Certified Arborist or as provided by the approved landscape plan.

Storage and Disposal: Do not store or discard any supply or material, including paint, lumber, concrete overflow, etc. within the protection zone. Remove all foreign debris within the protection zone; it is important to leave the duff, mulch, chips, and leaves around the retained trees for water retention and nutrients. Avoid draining or leakage of equipment fluids near retained trees. Fluids such as: gasoline, diesel, oils, hydraulics, brake and transmission fluids, paint, paint thinners, and glycol (anti-freeze) should be disposed of properly. Keep equipment parked at least 50 feet away from retained trees to avoid the possibility of leakage of equipment fluids into the soil. The effect of toxic equipment fluids on the retained trees could lead to decline and death.

Grade Changes: Grade changes, including adding fill, are not permitted within the tree protection zone without special written authorization and under supervision by a Certified Arborist or as provided by the approved landscape plan. Lowering the grade within this area will necessitate cutting main support and feeder roots, jeopardizing the health and structural integrity of the tree(s). Adding soil, even temporarily, on top of the existing grade will compact the soil further, and decrease both water and air availability to the trees' roots.

Moving Construction Materials: Care will be taken when moving equipment or supplies near the trees, especially overhead. Avoid damaging the tree(s) when transporting or moving construction materials and working around the tree (even outside of the fenced tree protection zone). Above ground tree parts that could be damaged (e.g., low limbs, trunks) should be flagged with red ribbon. If contact with the tree crown is unavoidable, prune the conflicting branch(es) using ISA standards.

Root Pruning: Except where specifically approved in writing or as provided in Attachment 3, all trenching shall be outside of the fenced protection zone. Roots primarily extend in a horizontal direction forming a support base to the tree similar to the base of a wineglass. Where trenching is necessary in areas that contain tree roots, prune the roots using a Dosko root pruner or equivalent. All cuts should be clean and sharp, to minimize ripping, tearing, and fracturing of the root system. The trench should be made no deeper than necessary.

Irrigation: Trees that have been substantially root pruned (30% or more of their root zone) will require irrigation for the first twelve months. The first irrigation should be within 48 hours of root pruning. They should be deep watered every two to four weeks during the summer and once a month during the winter (adjust accordingly with rainfall). One irrigation cycle should thoroughly soak the root zones of the trees to a depth of 3 feet. The soil should dry out between watering; avoid keeping a consistently wet soil. Designate one person to be responsible for irrigating (deep watering) the trees. Check soil moisture with a soil probe before irrigating. Irrigation is best accomplished by installing a temporary above ground micro-spray system that will distribute water slowly (to avoid runoff) and evenly throughout the fenced protection zone ***but never soaking the area located within 6- feet of the tree trunk, especially during warmer months***.

Pruning: Do not prune any of the trees until all construction is completed. This will help protect the tree canopies from damage. All pruning shall be completed under the direction of an ISA Certified Arborist and using ISA guidelines. Only dead wood shall be removed from tree canopies.

Washing: During construction in summer and autumn months, wash foliage of trees adjacent to the construction sites with a strong water stream every two weeks in early hours before 10:00 a.m. to control mite and insect populations.

Inspection: An ISA Certified Arborist shall inspect the impacted preserved trees on a monthly basis during construction. A report comparing tree health and condition to the original, pre-construction baseline shall be submitted following each inspection. Photographs of representative trees are to be included in the report on a minimum annual basis.

Maintenance After Construction

Once construction is complete the fencing may be removed and the following measures performed to sustain and enhance the vigor of the preserved trees.

Mulch: Provide a 4-inch mulch layer under the canopy of trees. Mulch should include clean, organic mulch that will provide long-term soil conditioning, soil moisture retention, and soil temperature control.

Pruning: The trees will not require regular pruning. Pruning should *only* be done to maintain clearance and remove broken, dead or diseased branches. Pruning shall only take place following a recommendation by an ISA Certified Arborist and performed under the supervision of an ISA Certified Arborist. No more than 20% of the canopy shall be removed at any one time. All pruning shall conform to International Society of Arboriculture standards.

Watering: The natural trees that are not disturbed should not require regular irrigation, other than the twelve months following substantial root pruning. However, soil probing will be necessary to accurately monitor moisture levels. Especially in years with low winter rainfall, supplemental irrigation for the trees that sustained root pruning and any newly planted trees may be necessary. The trees should be irrigated *only* during the winter and spring months.

Watering Adjacent Plant Material: All plants near the trees shall be compatible with water requirements of said trees. The surrounding plants should be watered infrequently with deep soaks and allowed to dry out in-between, rather than frequent light irrigation. The soil shall not be allowed to become saturated or stay continually wet. Irrigation spray shall not hit the trunk of any tree. A 60-inch dry-zone shall be maintained around all tree trunks. An above ground micro-spray irrigation system is recommended over typical underground pop-up sprays.

Washing: Periodic washing of the foliage is recommended during construction but no more than once every two weeks. Washing should include the upper and lower leaf surfaces and the tree bark. This should continue beyond the construction period at a less frequent rate with a high-powered hose only in the early morning hours. Washing will help control dirt/dust buildup that can lead to mite and insect infestations.

Spraying: If the trees are maintained in a healthy state, regular spraying for insect or disease control should not be necessary. If a problem does develop, an ISA Certified Arborist should be consulted; the trees may require application of insecticides to prevent the intrusion of bark-boring beetles and other invading pests. All chemical spraying should be performed by a licensed applicator under the direction of a licensed pest control advisor.

Inspection: All trees that were impacted during construction within the tree protection zone should be monitored by an ISA Certified Arborist for the first five years after construction completion. The Arborist shall submit an annual report, photograph each tree and compare tree health and condition to the original, pre-construction baseline.

Appendix C

Geotechnical Assessments

Geotechnical Assessments

Report of Geotechnical Engineering Investigation

Cal Land Engineering, Inc.
dba Quartech Consultants
Geotechnical, Environmental, and Civil Engineering

April 22, 2014

Mr. Ken He
Yihe California PTY. LTD.
682 Deodar Lane
Bradbury, California 91008e

Subject: Report of Geotechnical Engineering Investigation
1849-1901 Royal Oaks Drive, APN: 8527-024-041, (7 Lots), Bradbury, California
QCI Project No.: 13-034-007EG

Gentlemen:

In accordance with your request, Quartech Consultants (QCI) is pleased to submit this Geotechnical Engineering Report for the subject site. The purpose of this report was to evaluate the subsurface conditions and provide recommendations for foundation designs and other relevant parameters of the proposed construction.

Based on the findings of our field exploration, laboratory testing and engineering analysis, the proposed construction of the subject site for the intended use is feasible from the geotechnical engineering viewpoints, provided that specific recommendations set forth herein are followed.

This opportunity to be of service is sincerely appreciated. If you have any questions pertaining to this report, please call the undersigned.

Respectfully submitted,

Cal Land Engineering, Inc. (CLE)
dba Quartech Consultants (QCI)

Jack C. Lee, GE 2153

Abe Kazemzadeh

Reviewed by:

Fred Aflakian, CEG 2051

Dist: (4) Addressee

REPORT OF GEOTECHNICAL ENGINEERING INVESTIGATION

Proposed Residential Development

At

APN: 8527-021-041
1849-1901 Royal Oaks Drive
Bradbury, California

Prepared by

QUARTECH CONSULTANTS (QCI)

Project No.: 13-034-041EG

April 22, 2014

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 Purpose

This report presents a summary of our preliminary geotechnical engineering investigation for the proposed development at the subject site. The purposes of this investigation were to evaluate the subsurface conditions at the area of proposed construction and to provide recommendations pertinent to grading, foundation design and other relevant parameters of the proposed development.

1.2 Scope of Services

Our scope of services included:

- Review of available soil and geologic data of the area.
- Subsurface exploration consisting of logging and sampling of seven test pits. The test pits were extended to a maximum depth of 7.0 feet below the existing ground surface. Test pit logs are presented in Appendix A.
- Laboratory testing of representative samples to establish engineering characteristics of the on-site soil. The laboratory test results are presented in Appendices A and B.
- Engineering analyses of the geotechnical data obtained from our background studies, field investigation, and laboratory testing.
- Preparation of this report presenting our findings, conclusions, and recommendations for the proposed residential construction.

1.3 Proposed Construction

It is anticipated that the proposed development is to subdivide the property into 6-9 residential lots. The proposed building is anticipated to be one and/or two-story wood frame structures with concrete slab-on-grade. Column loads are unknown at this time, but are expected to be light to medium. Cut and fill grading operation is anticipated to reach the desired grades.

1.4 Site Location

The project site is located at the north side of Royal Oaks Drive in the City of Bradbury, California. The approximately location of the site is presented in the attached Site Location Map (Figure 1). The subject site is currently occupied by a single-family residence at the time of our field investigation. No major surface erosions were observed. Detailed configuration of the site is presented in the attached site plan (Figure 2).

2.0 SUBSURFACE EXPLORATION AND LABORATORY TESTING

2.1 Subsurface Exploration

Our subsurface investigation consisted of excavation of seven test pits to a maximum depth of 7.0 feet at the locations shown on the attached Site Plan, Figure 2. The test pits were supervised and logged by an engineering geologist. Relatively undisturbed and bulk samples were collected during excavation for laboratory testing. Logs of test pit are presented in Appendix A.

2.2 Laboratory Testing

Representative samples were tested for the following parameters: in-situ moisture content, direct shears strength, expansion and corrosion potential. Results of our laboratory testing along with a summary of the testing procedures are presented in Appendix B. In-situ moisture test results are presented on the boring logs in Appendix A.

3.0 GEOLOGIC SETTING

3.1 Site Geology

The earth materials encountered at the subject site include fill and alluvial fan deposits. Description of the subsurface materials from top down is provided as follows:

Fill (af): The subject site is underlain by about 1.0 to 4.0 feet of fill and surficial soils. Fill materials consist of brown silty sand, and exists in the moist and loose condition. The fills appear to be derived from the onsite soils and placed during the site's previous activities.

Alluvial Fan Deposits (Qal):

Underlying the fill is the natural soils. The test pits encountered remnants of older dissected alluvial fan deposits. These soils consist of brown silty sand, with some fine to coarse gravel, and exist in the slightly moist and medium dense to dense conditions.

3.2 Groundwater

Groundwater was not encountered during our field exploration. In our opinion, groundwater will not be a problem during construction.

4.0 SEISMICITY

4.1 Faulting

Based on our study, an active Duarte Fault, which was recently mapped in late 2014, is crossing north of the property. The site is located within the designated Alquist-Priolo fault zone. It should be noted that this report does not address potential required fault study, which may be required by the reviewing agency.

4.2 Seismicity

The subject site is located in southern California, which is a tectonically active area. The type and magnitude of seismic hazards affecting the site depend on the distance to causative faults, the intensity, and the magnitude of the seismic event. Table 1 indicates the distance of the fault zones and the associated maximum magnitude earthquake that can be produced by nearby seismic events. As indicated in Table 1, the Sierra Madre Fault zones are considered to have the most significant effect to the site from a design standpoint.

TABLE 1

Characteristics and Estimated Earthquakes for Regional Faults

Fault Name	Approximate Distance to Site (mile)	Maximum Magnitude Earthquake (Mw)
Sierra Madre	0.7	7.2
Raymond	2.0	6.8
Clamshell-Sawpit	3.0	6.7
San Jose	8.6	6.7
Elysian Park (Upper)	9.4	6.7
Verdugo	10.9	6.9
Elsinore. W	11.4	7.0
Cucamonga	13.5	6.7
Chino alt 2	14.7	6.8
Puente Hills (Santa Fe Spring)	15.1	6.7
Puente Hills (LA)	15.3	7.0
Hollywood	15.4	6.7
Puente Hills (Coyote Hills)	17.9	6.9
Santa Monica Connected alt 2	18.5	7.4

Reference: 2008 National Seismic Hazard Maps-Source Parameters

4.3 Estimated Earthquake Ground Motions

In order to estimate the seismic ground motions at the subject site, QCI has utilized the seismic hazard map published by California Geological Survey. According to this report, the peak ground Alluvium acceleration at the subject site for a 10% probability of exceedance in 50 years is about 0.551 g (NSHMP, 2008 Deaggregation of Seismic Hazards).

4.0 SLOPE STABILITY

4.1 Slope Stability

An existing natural slope occupies the mostly northerly portion of the site. The slope is approximately 230 feet in height and the slope ratio is approximately 1.5 to 1 (horizontal to vertical) within the property. The existing slope is mantled by a thin layer of surficial soils and older alluvial deposits. The slope is considered grossly stable based on our field observation and investigation, and should remain so under normal conditions and maintenance.

4.2 Surficial Slope Stability and Landscaping

All slopes will be subject to surficial erosion. Therefore, slopes should be protected from surface runoff by means of top-of-slope compacted earth berms or concrete interceptor drains. All slopes should be landscaped with a suitable plant material requiring minimal cultivation and irrigation water in order to thrive. An irrigation system should be installed. Overwatering and subsequent saturation of slope surfaces should be avoided. The slope area outside the proposed construction area should remain intact and the vegetation should be maintained from drying to protect the slope form erosion. Overwatering and subsequent saturation of slope surfaces should be avoided. All roof runoff from exiting residence and addition should be directed to the street or to a drainage conduit.

5.0 CONCLUSIONS

Based on the results of our subsurface investigation and engineering analyses, it is our opinion that the proposed construction is feasible from a geotechnical standpoint, provided the recommendations contained herein are incorporated in the design and construction.

5.1 Seismicity

The site is located in a seismically active region and is subject to seismically induced ground shaking from nearby and distant faults, which is a characteristic of all Southern California. Based on our review of the latest “Earthquake Zone” by California Geological Survey, Duarte Fault, which was recently mapped in 2014, is crossing the property.. Duarte Fault is a strand of the Sierra Madre Fault. The fault trace study is not a part of this report.

5.2 Seismic Induced Hazard

Based on our review of the "7.5 Minute Seismic Hazard Zones, Azusa Quadrangle" by the California Geological Survey, the southerly portion of the site is not located within the mapped potential earthquake induced landslide areas. Portions of the north existing slope are mapped within the seismic induced landslide areas. However, based on our field investigation, it is our opinion that the existing slope is underlain by dense older alluvium and is grossly stable.

5.3 Excavatability

Based on our subsurface investigation, excavation of the subsurface materials should be able to be accomplished with conventional earthwork equipment.

5.4 Surficial Soil Removal

Based on our field investigation and laboratory testing program, it is concluded that the existing near surface materials consisting of previously placed un-documented fill and are not unsuitable for support of fills and structures as they presently exist and will require remedial grading as discussed herein.

5.5 Groundwater

Groundwater was not encountered during our field exploration. In our opinion, groundwater will not be a problem during construction.

6.0 RECOMMENDATIONS

The following recommendations should be incorporated into the design or construction phases.

6.1 Grading

6.1.1 Site Preparation

Prior to initiating grading operations, any existing vegetation, trash, debris, over-sized materials (greater than 8 inches), and other deleterious materials within fill areas should be removed.

6.1.2 Excavation/Surficial Soil Removals

In construction areas, unsuitable surficial materials, including existing topsoils, previously placed fill and disturned alluvium, should be removed to competent older alluvium as directed by the project geotechnical consultants. Based on our field exploration and laboratory data obtained to date, it is recommended that the existing surficial soils be removed to a minimum depth of 4 feet below the existing grade may be anticipated. Locally deeper removals may be necessary to expose competent natural ground. The actual removal depths should be determined in the field as conditions are exposed. Visual inspection and/or testing may be used to define removal requirements.

6.1.3 Treatment of Removal Bottoms

Soils exposed within areas approved for fill placement should be scarified to a depth of 6 inches, conditioned to near optimum moisture content, then compacted in-place to 90 percent relative compaction based on laboratory standard ASTM D-1557-09.

6.1.4 Structural Backfill

The onsite soils may be used as compacted fill, provided they are free of organic materials and debris. Fills should be placed in relatively thin lifts, brought to near optimum moisture content, then compacted to obtain at least 90 percent relative compaction based on ASTM D-1557-09.

6.1.5 Fill Slopes

Any proposed fill slopes should be constructed no steeper than 2 to1 and keyed and benched into approved older alluvium. Fill materials should be placed and compacted in accordance with this report. Keys and benches should be observed by the project geotechnical consultants.

6.1.6 Cut Slopes

Cut slopes should possess an adequate factor of safety against deep-seated failure at a slope ratio of 2 to 1 (horizontal to vertical). It is recommended that all cut slopes be inspected by the project geotechnical consultants to evaluate the need for any slope stabilization, whether anticipated at this time or not.

6.2 Foundation Design

6.2.1 Shallow Foundation System

An allowable bearing value of 2000 pounds per square foot (psf) may be used for design of the footings placed at a depth of at least 18 inches below the lowest adjacent ground and founded on the competent soils. Single spread footings should be at least 24 inches square and continuous footings should be at least 12 inches wide. This bearing value may be increased by 200 psf for each additional foot of depth or width to a maximum value of 2500 psf. The above recommended value may be increased by one third (1/3) when considering short duration seismic or wind loads.

6.2.2 Settlement

Settlement of the footings placed as recommended and subject to no more than allowable loads is not expected to exceed 3/4 inch. Differential settlement between adjacent columns is not anticipated to exceed 1/2 inch.

6.2.3 Lateral Pressure

The active earth pressure to be utilized for cantilever retaining wall design may be computed as an equivalent fluid pressure of 33 pounds per cubic foot (pcf) when the slope of the backfill behind the wall is level. Where the slope of the backfill is 2 to 1, an equivalent fluid pressure of 45 pounds per cubic foot should be used.

The earth pressure to be utilized for restrained retaining wall design may be computed as an equivalent fluid pressure of 60 pounds per cubic foot (pcf) when the slope of the backfill behind the wall is level.

Passive earth pressure may be computed as an equivalent fluid pressure of 350 pounds per cubic foot, with a maximum earth pressure of 2500 pounds per square foot. An allowable coefficient of friction between soil and concrete of 0.35 may be used with the dead load forces. When combining passive pressure and frictional resistance, the passive pressure component should be reduced by one third (1/3). These values assume free-draining conditions.

6.2.4 Foundation Setback

All residential foundation should be setback from the adjacent slope face per current City's building code. Additionally, all foundations should maintain a minimum horizontal distance of 7 feet between the edge of the footing and the slope face. No passive pressure is allowed for the portion of the footing, which maintains less than 7 horizontal feet between the edge of the footing and the slope face.

6.3 Foundation Construction

It is anticipated that the entire structure will be underlain by onsite soils of very low expansion potential. The following presented our recommendations for the foundation construction. All shallow footings should be founded at a minimum depth of 18 inches below the lowest adjacent ground surface. All continuous footings should have at least two No. 4 reinforcing bars placed at the top and two No. 4 reinforcing bars placed at the bottom of the footing.

6.4 Concrete Slab on Grade

Concrete slabs should be a minimum of 4 inches thick and reinforced with a minimum of No. 3 reinforcing bar spaced 16-inch each way or its equivalent. All slab reinforcement should be supported to ensure proper positioning during placement of concrete. Concrete slabs in moisture sensitive areas should be underlain with a vapor barrier consist of a minimum of ten-mil polyvinyl chloride membrane with all laps sealed. A minimum of 2 inches of sand should be placed over the membrane to aid in uniform curing of concrete.

6.5 Retaining Wall Backfill

The wall backfill and any other structures should be compacted. All soil backfill should be compacted to obtain a minimum relative compaction of 90 percent of the ASTM D-1557-09. No flooding and/or jetting is allowed for the onsite soils. Adequate drainage system should be provided behind the walls to prevent the build-up of any hydrostatic pressure. Observation and testing of all compaction should be performed under the direction of the project geotechnical engineer.

The retaining walls should be provided with backdrains to reduce the potential for the buildup of hydrostatic pressure. Backdrains should consist of 4-inch (minimum) diameter perforated PVC pipe surrounded by a minimum of 1 cubic foot per lineal foot of clean coarse gravel wrapped in filter fabric (Mirafi 140 or the equivalent) placed at the base of the wall. The drain should be covered by no less than 18 inches (vertical) of compacted wall backfill soils. The backdrain should outlet through non-perforated PVC pipe or weepholes. Alternatively, commercially available drainage fabric (i.e., J-drain) could be used. The fabric manufacturer's recommendations should be followed in the installation of the drainage fabric backdrain.

6.6 Temporary Trench Excavation and Backfill

All trench excavations should conform to CAL-OSHA and local safety codes. All utilities trench backfill should be brought to near optimum moisture content and then compacted to obtain a minimum relative compaction of 90 percent of ASTM D-1557-07.

7.0 CORROSION POTENTIAL

Chemical laboratory tests were conducted on the existing onsite near surface materials sampled during QCI's field investigation to aid in evaluation of soil corrosion potential and the attack on concrete by sulfate soils. The testing results are presented in Appendix B.

According to CBC 2013 and ACI 318-11, a “negligible” exposure to sulfate can be expected for concrete placed in contact with the onsite soils. Therefore, Type II cement or its equivalent may be used for this project. Based on the resistivity test results, it is estimated that the subsurface soils are moderately corrosive to buried metal pipe. It is recommended that any underground steel utilities be blasted and given protective coating. Should additional protective measures be warranted, a corrosion specialist should be consulted.

8.0 SEISMIC DESIGN

Based on our studies on seismicity, there are no known active faults crossing the property. However, the subject site is located in southern California, which is a tectonically active area. Based on ASCE 7 –10 Standard (CBC 2013), the following seismic related values may be used:

Seismic Parameters (Latitude: 34.144752, Longitude: -117.964669)	
Mapped 0.2 Sec Period Spectral Acceleration **S_S**	2. 545g
Mapped 1.0 Sec Period Spectral Acceleration **S_1**	0.950g
Site Coefficient for Site Class “D”, **F_a**	1.0
Site Coefficient for Site Class “D”, **F_v**	1.5
Maximum Considered Earthquake Spectral Response Acceleration Parameter at 0.2 Second, **S_{MS}**	2.545g
Maximum Considered Earthquake Spectral Response Acceleration Parameter at 1.0 Second, **S_{M1}**	1.425g
Design Spectral Response Acceleration Parameters for 0.2 sec, **S_{DS}**	1.697g
Design Spectral Response Acceleration Parameters for 1.0 Sec, **S_{D1}**	0.950g

The Project Structural Engineer should be aware of the information provided above to determine if any additional structural strengthening is warranted.

9.0 INSPECTION

As a necessary requisite to the use of this report, the following inspection is recommended:

- Temporary excavations.
- Removal of surficial and unsuitable soils.
- Backfill placement and compaction, and

- Utility trench backfill.

The geotechnical engineer should be notified at least 1 day in advance of the start of construction. A joint meeting between the client, the contractor, and the geotechnical engineer is recommended prior to the start of construction to discuss specific procedures and scheduling.

10.0 PLAN REVIEW

No detailed grading plans and/or topographic plans were available during CLE's preparation of this report. CLE should review the grading and foundation plans for conformance with the intent of our recommendations. Specific geological conditions related grading and/or foundation design recommendations will then be provided.

11.0 REMARKS

The conclusions and recommendations contained herein are based on the findings and observations at the exploratory locations. However, soil materials may vary in characteristics between locations of the exploratory locations. If conditions are encountered during construction which appear to be different from those disclosed by the exploratory work, this office shall be notified so as to recommend the need for modifications.

This report has been prepared in accordance with generally accepted professional engineering principles and practice. No warranty is expressed or implied. This report is subject to review by controlling public agencies having jurisdiction.

12.0 REFERENCES

"Report of Soils Investigation, Tract Number 47462, City of Bradbury, California", by DUCI Engineering, Inc., Job No. 9-320, dated November 10, 1989.

"Response to Geotechnical Review Sheet, Miscellaneous Transfer Drain No. 1338, Tract No. 47642, Bradbury, California", by DUCO Engineering, Inc., Job No. 9-320, dated February 28, 1992.

APPENDIX A
FIELD INVESTIGATION

Subsurface conditions were explored by excavation of twelve test pits to a maximum depth of 7.0 feet at approximate locations shown on the enclosed Site Plan, Figure 2.

The excavation of the test pit was supervised by an engineering geologist, who continuously logged the trenches and visually classified the soils in accordance with the Unified Soil Classification System. Bag samples were taken at frequent intervals.

Representative undisturbed samples of the subsurface soils were retained in a series of brass rings, each having an inside diameter of 2.42 inches and a height of 1.00 inch. All ring samples were transported to our laboratory. Bulk surface soil samples were also collected for additional classification and testing.

APPENDIX B

LABORATORY TESTING

During the subsurface exploration, QCI personnel collected relatively undisturbed ring samples and bulk samples. The following tests were performed on selected soil samples:

Moisture-Density

The moisture content and dry unit weight were determined for each relatively undisturbed soil sample obtained in the test borings in accordance with ASTM D2937 standard. The results of these tests are shown on the boring logs in Appendix A.

Shear Tests

Shear tests were performed in a direct shear machine of strain-control type in accordance with ASTM D3080 standard. The rate of deformation was 0.010 inch per minute. Selected samples were sheared under varying confining loads in order to determine the Coulomb shear strength parameters: internal friction angle and cohesion. The shear test results are presented in the attached plates.

Expansion Index

Expansion Index test was conducted on the existing onsite near surface materials sampled during QCI's field investigation. The test is performed in accordance with ASTM D-4829. The testing results are presented below:

Sample Location	Expansion Index	Expansion Potential
T-1 @ 0-3'	3	Very Low

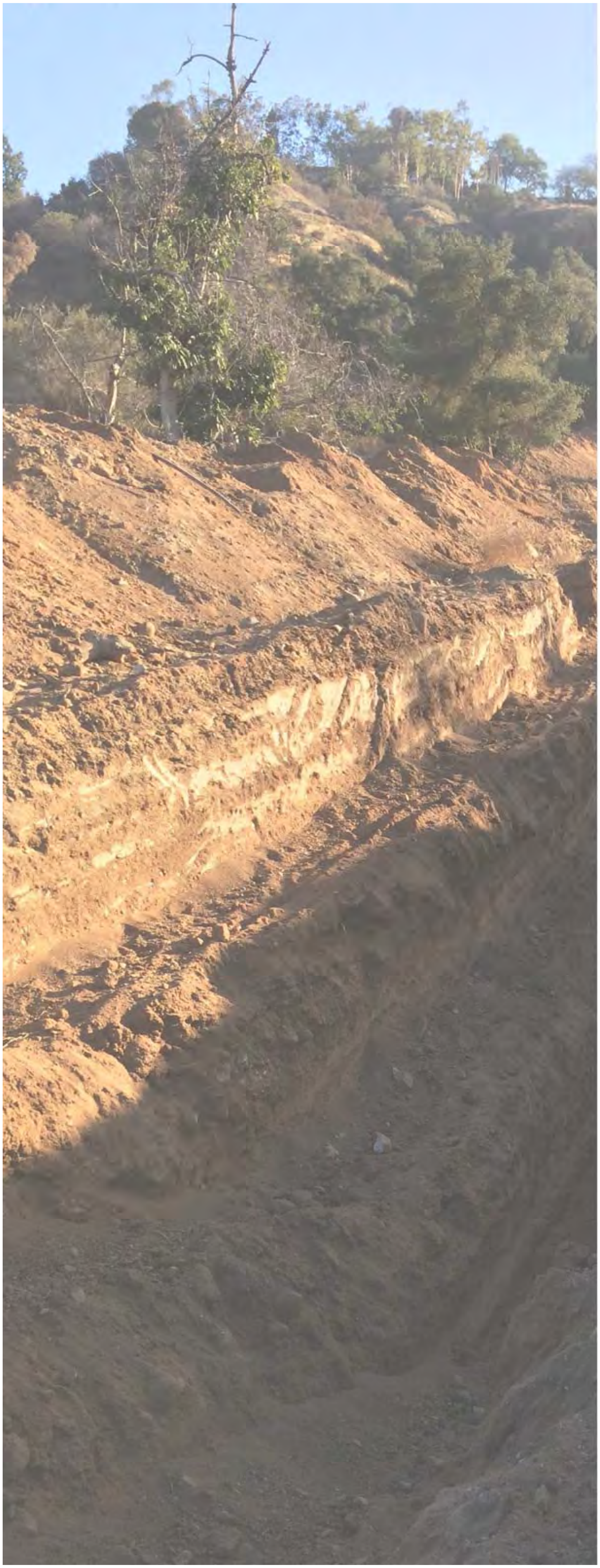
Corrosion Potential

Chemical laboratory tests were conducted on the existing onsite near surface materials sampled during QCI's field investigation to aid in evaluation of soil corrosion potential and the attack on concrete by sulfate soils. These tests are performed in accordance with California Test Method 417, 422, 532, and 643. The testing results are presented below:

Sample Location	pH	Chloride (ppm)	Sulfate (% by weight)	Min. Resistivity (ohm-cm)
T-1 @ 0’-3’	7.42	122	0.0045	2,100

Geotechnical Assessments

Fault Investigation



Fault Investigation for the Property at 1901 Royal Oaks Drive, Bradbury, Los Angeles County, California

Prepared for:
YIHE California PTY. LTD.

682 Deodar Lane
Bradbury, California 91008

Prepared by:
Earth Consultants International, Inc.

Earth Consultants International

1642 E. 4th Street • Santa Ana
California • 92701
Telephone: (714) 544-5321

Project Number 3509
October 6, 2015

Project No. 3509
October 6, 2015

To: **YIHE CALIFORNIA PTY. LTD.**
682 Deodar Lane
Bradbury, California 91008

Attention: **Mr. Ken He**

Subject: **Fault Investigation for the Property at 1901 Royal Oaks Drive, in the City of Bradbury, Los Angeles County, California**

Dear Mr. He,

Earth Consultants International, Inc. (ECI) is pleased to present this report summarizing our findings and conclusions of a study conducted at your request, and per your authorization, for the property at 1901 Royal Oaks Drive, in the city of Bradbury, Los Angeles County. The property is referred in this report as "the site." A residential building and another structure, both currently vacant, a pool, horse stables and horse arenas currently occupy the site. It is our understanding that the relatively flat southern portion of the site is to be subdivided into eight residential lots. The purpose of our study was to assess whether faults associated with the Sierra Madre fault system that would have the potential for future surface rupture extend beneath the portion of the site proposed to be re-developed, or within 50 feet north of the northernmost proposed building footprint. The specific branch of the Sierra Madre fault zone that has been inferred through the site is referred to as the Duarte fault.

To conduct this study we reviewed several publications and geological reports for other sites along the Duarte fault to summarize the current knowledge on this fault. We then excavated, cleaned, logged and photographed two trenches with a combined total length of about 540 feet. The trenches were excavated in a southerly direction, roughly perpendicular to the easterly trend of the Duarte fault as mapped through this area. The stratigraphic units exposed in the trenches were reviewed carefully for lateral truncations of units or offsets that would suggest faulting.

The subsurface data we collected indicate that the site is underlain by debris flow, sheet-food, and alluvial (stream) sediments emanating principally from the Bradbury Hills immediately to the north of the proposed development area. These sediments are generally coarse grained, varying in texture from sand to cobbles and boulders. Pedogenic (soil) development and intense weathering of the rock clasts observed in the deeper sections of the trenches indicate that the trenches were deep enough to expose sediments more than 11,700 years old, and thus Pleistocene in age. No breaks or disruptions in the lateral continuity of the sediments were observed in the trenches. Our observations indicate that there are no active faults beneath the area evaluated as part of this study. Therefore, measures designed to avoid or mitigate the potential for surface fault rupture are not deemed necessary for the proposed development. The trenches were reviewed by the City of Bradbury reviewing geologist. Once we completed our field documentation of the trenches, these were backfilled with the soils removed during the excavation; the backfill soils were placed at 90 percent or better of their maximum dry density. Soil technicians from Cal Land Engineering tested the backfill.

The following report describes in detail the trenches and sediments exposed therein, including an analysis of the age of the sediments, and our conclusions and recommendations regarding the surface fault rupture potential at the site.

We appreciate the opportunity to provide geological services for this project. Should you have any questions regarding the information presented herein, please do not hesitate to contact us at (714) 412-2654.

Respectfully submitted,
EARTH CONSULTANTS INTERNATIONAL, INC.
Registered Geologists and Certified Engineering Geologists

Tania Gonzalez, CEG 1859
Sr. Project Consultant / Vice-President

Report Distribution:
Addressee: 3 Hardcopies and 1 Digital Copy
Jeffrey B. Causey, Studio IE: 1 Digital Copy
Jack Lee, Cal Land Engineering: 1 Digital Copy

TABLE OF CONTENTS

FAULT INVESTIGATION FOR THE PROPERTY AT1901 ROYAL OAKS DRIVE, IN THE CITY OF BRADBURY, LOS ANGELES COUNTY, CALIFORNIA

1.0 INTRODUCTION

1.1 Purpose of the Study, Scope of Work and Methodology

At your request, and per your authorization, we are pleased to present this report summarizing the results of a fault investigation we conducted for a site with street address at 1901 Royal Oaks Drive, in the city of Bradbury. The Alquist-Priolo Earthquake Fault Zone (APEFZ) map for the Azusa Quadrangle (California Geological Survey - CGS, 2014) shows that the entire site is located within the APEFZ for the Duarte fault, an inferred southern trace of the Sierra Madre fault zone (Figure 1). The APEFZ map shows that the Duarte fault in the site vicinity is thought to consist of one trace that extends across the subject site in an easterly to east-southeasterly direction. The State of California considers a fault active if it has moved at least once in the past about 11,000 to 11,700 years, during the Holocene (the Act says 11,000 years but the CGS is now using 11,700 years).

The study summarized herein was designed to evaluate whether or not active faults associated with the Duarte fault extend through the developable portion of the site, or within 50 feet to the north of the northernmost proposed building footprint. Geologic studies such as this one are required for properties within an APEFZ if the site is to be developed or re-developed for habitable purposes (the State requires these studies for a project of four or more units).

The purpose of this study was three-fold:

1) Investigate the area of the site proposed for development for the presence of faults;
2) Evaluate the age of the geologic units encountered in the trenches to assess whether or not Holocene-age deposits or surfaces are faulted; and
3) If faults were encountered, evaluate the potential for future fault displacement, and provide specific recommendations for mitigation, as warranted.

Specific tasks that we conducted as part of this study, and the methodology that we used, are described below.

- We obtained and reviewed readily available pertinent maps and publications summarizing the regional geology, including published reports on the Duarte fault, and consulting reports for the site vicinity that were readily available (see the list of References in Appendix A).

- We marked the trench locations (Photo 1) and notified Underground Services Alert (USA) to confirm that there were no underground utilities underneath the proposed trench locations (Photo 2). The trenches extended in a southerly direction from approximately 50 feet to the north of the northernmost proposed building footprint to the southern property boundary. The trenches were located so as to miss as much as possible the existing oak trees onsite, and to veer southwesterly, away from the active channel near the eastern property boundary.

Photo 1: Trench location was marked with white stakes and flagging.

Photo 2: Information on location of proposed trenches was sprayed painted at the site entrance to assist the Underground Services Alert (USA) utility locators that responded to our request.

- We subcontracted the excavation of one long trench (Trench 1a) that extended in a southwesterly direction across most of the study area (Photo 3). Trench 1a was almost 490 feet long, between about 10 and 14 feet deep, and oriented between about S4W and S65W. As mentioned above, the trench was curved southwesterly to avoid the mature oak trees on the property and to veer away from the channel near the site's eastern boundary. To investigate the southernmost portion of the site, we also excavated a shorter trench (Trench 1b) that extended from the southern fence northward to overlap with the longer trench (Figure 2). Trench 1b was approximately 50 feet long, not including the access ramp on its north end, between about 8.7 and 14.5 feet deep, and was oriented predominantly in a N22W direction (Photo 4). The trenches were excavated with a 320 Caterpillar excavator fitted with a 3-foot-wide bucket. For safety reasons, and in accordance with Cal-OSHA requirements, the trenches were benched, with each bench not exceeding 5 feet in height, and ramped on one end to allow entry into and exit out of their deeper portions (Photos 3 and 4).

- Once the trenches were dug, we used hand scrapers and brushes to clean the trench walls, removing smears left behind by the trackhoe's bucket and exposing a fresh surface for logging. To prepare the trenches for logging, we used string and nails to establish a level line on each bench to use as a reference, and marked stations at 5-foot intervals using spay paint directly on the trench walls, adjacent to the level lines. We then made a graphic representation of the eastern wall exposures (that is, we logged the eastern trench walls) by measuring from the level lines to the contacts between stratigraphic units and other pertinent features, such as top and bottom of the trenches and the benches. Discrete sedimentary layers, soil horizons, large boulders, animal burrows (krotovinas) and other features were plotted on the logs. The geologic units and soils exposed in the trenches were described, and the lateral continuity of these units was reviewed. We also photographed the trench walls. A photomosaic of Trench 1b is included in Plate 2.

Photo 3: View to the south of the excavation of Trench 1a, showing the excavator used for the job. Note the benches.

Photo 4: View to the north of the northeast wall of trench T-1b showing the benches, access ramp, level lines and flagged units.

- We looked for samples of organic material, such as detrital charcoal, that could be dated using the radiocarbon dating method. We did not find any samples that were reliably associated with undisturbed sediments (the charcoal samples that we did see were typically near or within animal burrows, or were in the uppermost layers of the trench, and thus not helpful in establishing the age of the sediments exposed at depth). We also proposed to collect one sample of sediment to be dated using the Optically Stimulated Luminescence (OSL) method. However, none of the laboratories that we contacted could provide an OSL age in less than 12 months. Thus, we estimated the age of the sediments using soil-stratigraphic methods that rely on the degree of soil development. Our soil descriptions are included in the trench logs. Additional information regarding soil-age dating methods is provided in Section 2.4, and our findings are presented in Section 3.2. We also noted the degree of weathering of the clasts (cobbles and boulders) and compared these observations to McFadden et al.'s (1982) clast weathering stages (Section 2.5).

- We notified the City of Bradbury and requested that their geological consultant review the trenches. Mr. Mark Schluter, Sr. Engineering Geologist with Converse Consultants, and the acting City of Bradbury geologist, reviewed the excavations on August 18, 2015.

- We located the trenches on a topographic map of the site prepared by and provided to us by Cal Land Engineering (CLE). To do so, we used a Brunton compass and measuring tape to locate the trenches relative to known points on the map, such as power poles, rock walls, and trees. Since we did not find any faults in the excavations, the services of a professional surveyor to locate the faults were not deemed necessary.

- We had the trenches backfilled using the soils removed during the excavation (Photo 5). The soils were moisture-conditioned and compacted to at least 90 percent of their maximum dry density. CLE provided observation and engineering testing services during the backfill. Their compaction report is included here in Appendix B.

Photo 5: View to the north-northeast of the site after Trench 1a had been backfilled.

- We prepared this report and accompanying illustrations summarizing our findings, conclusions and recommendations.

This investigation addresses only the hazard of surface fault rupture. Potential issues associated with slope instability, including earthquake-induced slope failure, were not part of our scope of work and are not addressed herein.

1.2 Site Location and Description

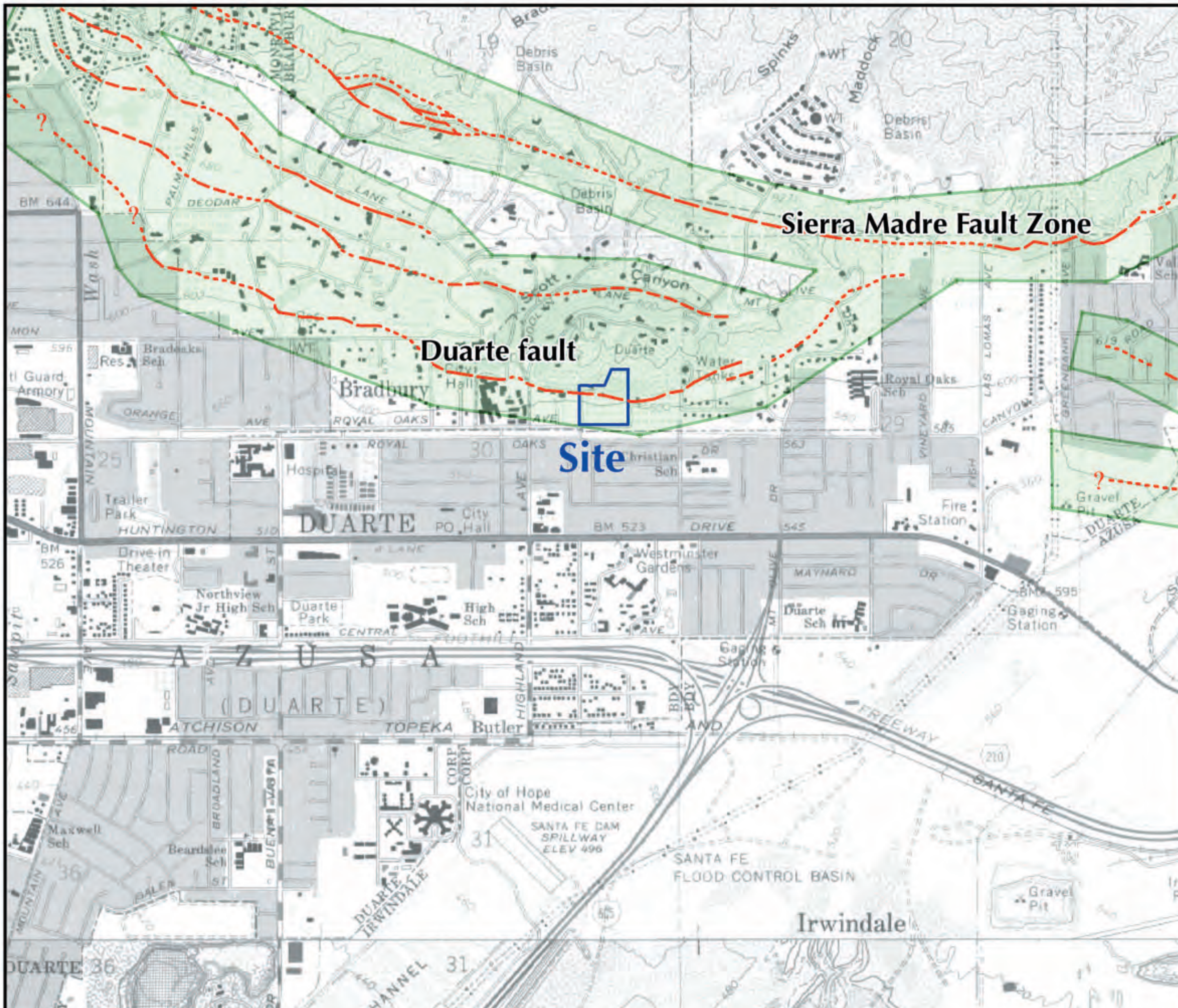
The site is located directly to the northeast of where Royal Oaks Drive and Royal Oaks Avenue come together, in the southeastern portion of the city of Bradbury, a hillside community at the base of the San Gabriel Mountains in eastern Los Angeles County, California. The property is irregular in shape: the southern approximately four-fifths form a rough square, topped to the northeast by a polygon-shaped section, as shown on Figure 1.

The southern portion of the site slopes gently to the south-southwest at a gradient that varies from about 5 feet vertical for every 40 feet horizontal (8:1), to about 5 feet vertical for 80 feet horizontal (16:1). In the northern portion of the site, the topography steepens significantly, to a gradient of more than 10 feet vertical for every 20 feet horizontal (2:1). Based on a site plan provided to us by CLE, elevations at the site range from 840 feet above mean sea level where the top of the ridgeline intersects the northern property boundary, to an elevation of 575 feet above mean sea level at the site's southeastern corner. Geomorphically, the portion of the site proposed for development is located at the base of the Bradbury Hills, or Bradbury piedmont, an elevated area south of the San Gabriel Mountains that is interpreted to be bound by elements of the Sierra Madre fault to the north and south, and in between (Treiman, 2013). Several small steep channels draining this elevated area flow into the gently sloping southern portion of the site, where they spread out at the break in slope. As a result, the southern portion of the site is underlain by a series of mudflow, sheet-flood and alluvial deposits. These geologic units are described in detail in Section 3.1.

At the time of our investigation, the site was occupied by a main residential structure, and a smaller, unattached structure to the west of the main house. Both buildings were, to our knowledge, uninhabited. A drained (dry) swimming pool was located immediately to the east of the main house. To the south, scattered throughout the site were a few small structures that appear to have been used for horse stables. Open areas, including one enclosed by short fencing, appeared to be used to exercise horses (horse arenas). The site was at one time also used as a fruit orchard, with several avocado and citrus trees present around the property, generally placed in terraced rows. Irrigation to these trees appears to have been stopped some time before we commenced our fieldwork; several of the trees appeared stressed and the irrigation lines that we intersected in our excavations were no longer in use. In addition to the fruit trees, the site has several oak trees, especially toward the northern half of the site and in the hillside area outside of where development is proposed. The southern property boundary abuts a Los Angeles County Flood Control District easement that includes a concrete-lined channel and a hiking trail. Residential properties are located to the east and west of the site, and to the south, south of the trail and Royal Oaks Drive.

1.3 Project Description

It is our understanding that the approximately 10.7-acre site is to be re-developed into eight residential lots of varying size, with the area of proposed construction limited to the southern, more gently sloping portion. The four southernmost lots will each be about one acre (ranging from 43,638 to 45,013 square feet, based on a site plan dated September 8, 2015 provided to us by CLE). The northern four lots will include the hillside portion of the property to the north of the area proposed for development. These lots will vary in area from 65,501 square feet for Lot 5 on the property's northwestern corner, to 102,479 square feet (Lot 7). An east-trending private driveway with a cul-de-sac at its eastern end will service all eight proposed lots, with this driveway separating the four southern lots from the four lots to the north (see Figure 2). The proposed driveway will veer southward along the site's western boundary, with access onto Royal Oaks Drive, essentially following the site's current entrance. The proposed building pads will all be near the proposed private street.



N
W E
S

2000 0 2000

Feet

Scale: 1:24,000

Base Map: Sure!Maps Raster, 1998

EXPLANATION

Approximate Site Location

ALQUIST-PRIOLO EARTHQUAKE FAULT ZONE OF REQUIRED INVESTIGATION (CGS, 2004)

Earthquake Fault Zone Boundaries delineated by straight-line segments that connect encircled turning points; boundaries define the zone encompassing active faults that constitute a potential hazard to structures from surface faulting such that avoidance would be required.

Faults considered to have been active during Holocene time and to have potential for surface rupture; solid line where accurately located, long dash where approximately located, short dash where inferred, dotted where concealed; queried (?) indicates additional uncertainty.

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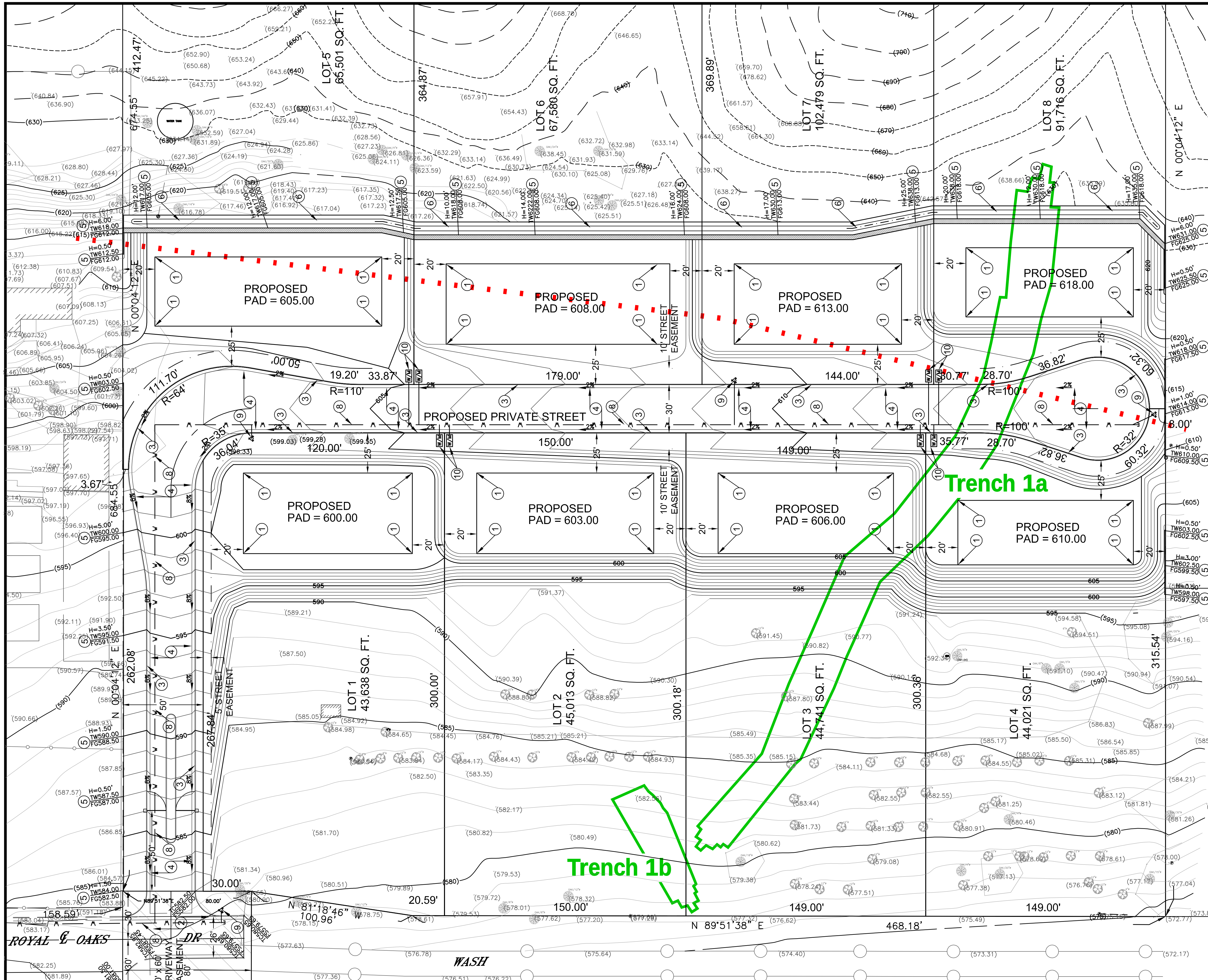
Project Number: 3509
Date: 2015

Site Location Map Showing the Alquist-Priolo Earthquake Fault Zone Boundaries

1901 Royal Oaks Drive, Bradbury, California

Figure 1



Trench Location Map Showing Inferred Duarte Fault and Location of Proposed Pads

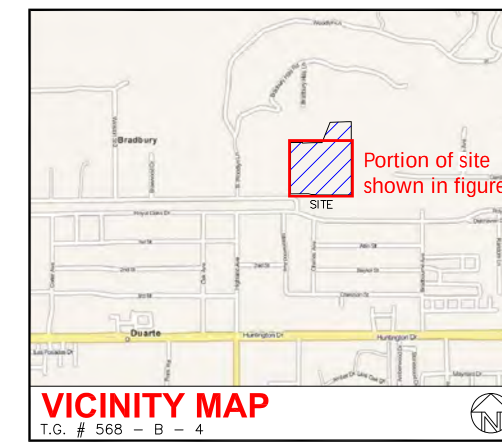
1901 Royal Oaks Drive, Bradbury, California

N

0 40 80

(IN FEET)
1 inch = 60 ft.

Approximate fault location (from CGS, 2014)



Base Map Prepared by: Jack Lee, R.C.E. 40870
CalLand Engineering, Inc., 09/08/2015
County Benchmark Number 2348
RDBM TAG in S CB 2FT w/o BCR @ SW COR
Highland Ave. and Huntington Dr.
Elevation: 536.752'

Only the southern portion of the site is shown; see Vicinity Map above.

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Project Number: 3509
Date: 2015

Figure 2

2.0 BACKGROUND

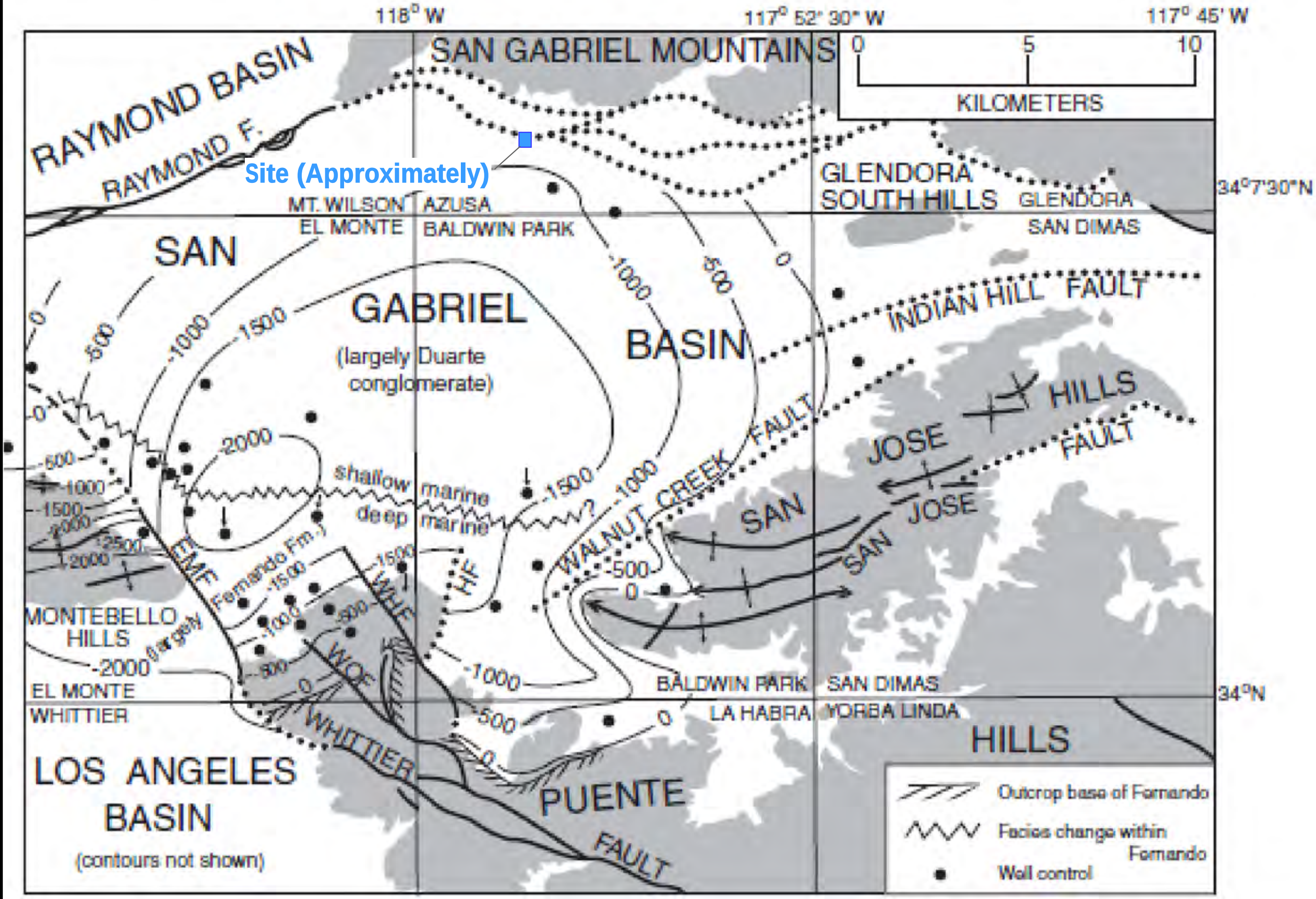
2.1 Regional Geologic Setting

The site is located at the transition zone between the Peninsular Ranges and the Transverse Ranges physiographic provinces of southern California. The Peninsular Ranges are characterized by northwest-trending geologic and physiographic features that are in turn dominated by zones of right-lateral strike-slip and oblique-slip faulting. Dominant features of the Peninsular Ranges include the San Andreas fault system, including the Elsinore-Whittier and Newport-Inglewood faults, to name only a few. Conversely, the Transverse Ranges are primarily controlled by west-trending physiographic and structural features, including the San Gabriel and Santa Monica Mountains, the reverse faults considered responsible for these uplifts, and the west-trending basins at the base of these highlands. Studies suggest that both the northwest- and west-trending systems of faults may be accommodating the north-south shortening (Yeats, 2004) and rotation that the Los Angeles region is currently experiencing in response to the "Big Bend" in the San Andreas fault to the north (Walls et al., 1998). In the site vicinity, the Transverse Ranges Southern Boundary fault system is defined by the Sierra Madre fault, a north-dipping reverse fault that extends for approximately 75 km from the northern San Fernando Valley eastward to San Antonio Canyon, where it connects with the Cucamonga fault (Yeats, 2004).

Most of the site is on the gently sloping floor of the San Gabriel Valley, a depositional basin on the south side of the San Gabriel Mountains, south of the main Sierra Madre fault. This roughly triangular-shaped basin plunges southwestward toward the Puente and Montebello hills, where the base of the Fernando Formation is approximately 6,500 (2,000 meters) below sea level. This deep-marine sedimentary unit grades northward and upward into a shallow marine and ultimately terrestrial facies called the Duarte Conglomerate (Yeats, 2004; see Figure 3). The Duarte Conglomerate crops out in the northern, steeper portion of the site, where it forms the base of the elevated area referred to by Treiman (2013) as the Bradbury piedmont. Additional information regarding the Duarte Conglomerate and other geologic units exposed at the site is provided in Section 3.1.

2.2 Duarte Fault

The Duarte fault is considered a southern element of the Sierra Madre Fault Zone (SMFZ), and some researchers have suggested that it is one of the youngest faults in the SMFZ as it appears to elevate the approximately 2.4-million-years-old Duarte Conglomerate 100 to 200 feet (30 to 60 meters) above the valley floor. Treiman (2013) indicates that the Duarte fault was first mapped by Eckis (1934), but that Shelton (1946) named it. The fault's location is inferred from geophysical profiles, groundwater elevation differences, and geomorphic indicators, but to date, to our knowledge, it has not been observed in trenches or exposures. In fact, Yeats (2004) shows the Duarte fault and other elements of the Sierra Madre fault bounding the San Gabriel Valley as buried or covered (see Figure 3). Crook et al. (1987), Dibblee (1998) and Morton and Miller (2006) also show the Duarte fault as buried (see Figures 4, 5, and 6, respectively), and Dibblee (1998) actually queries the fault through the site area, indicating that its "existence is doubtful." Note that Morton and Miller (2006) map the buried Duarte fault farther out in the valley, approximately along the site's southern boundary (Figure 6). Thus, the location, and even existence of this fault in the shallow subsurface are uncertain.



Structure contours, in meters, **of the base of the Fernando Formation.** In the San Gabriel Basin, the structure developed during Fernando deposition. Facies boundary is between a sequence of Duarte Conglomerate underlain by basal shallow-marine deposits, and a Los Angeles Basin sequence including deep-water Repetto and Pico Members.

Large **dots** indicate well control; dot with arrow indicates well did not reach base of the Fernando.

Faults are denoted by heavy lines and, where covered, by small dots.

From Figure 8 of Yeats, 2004

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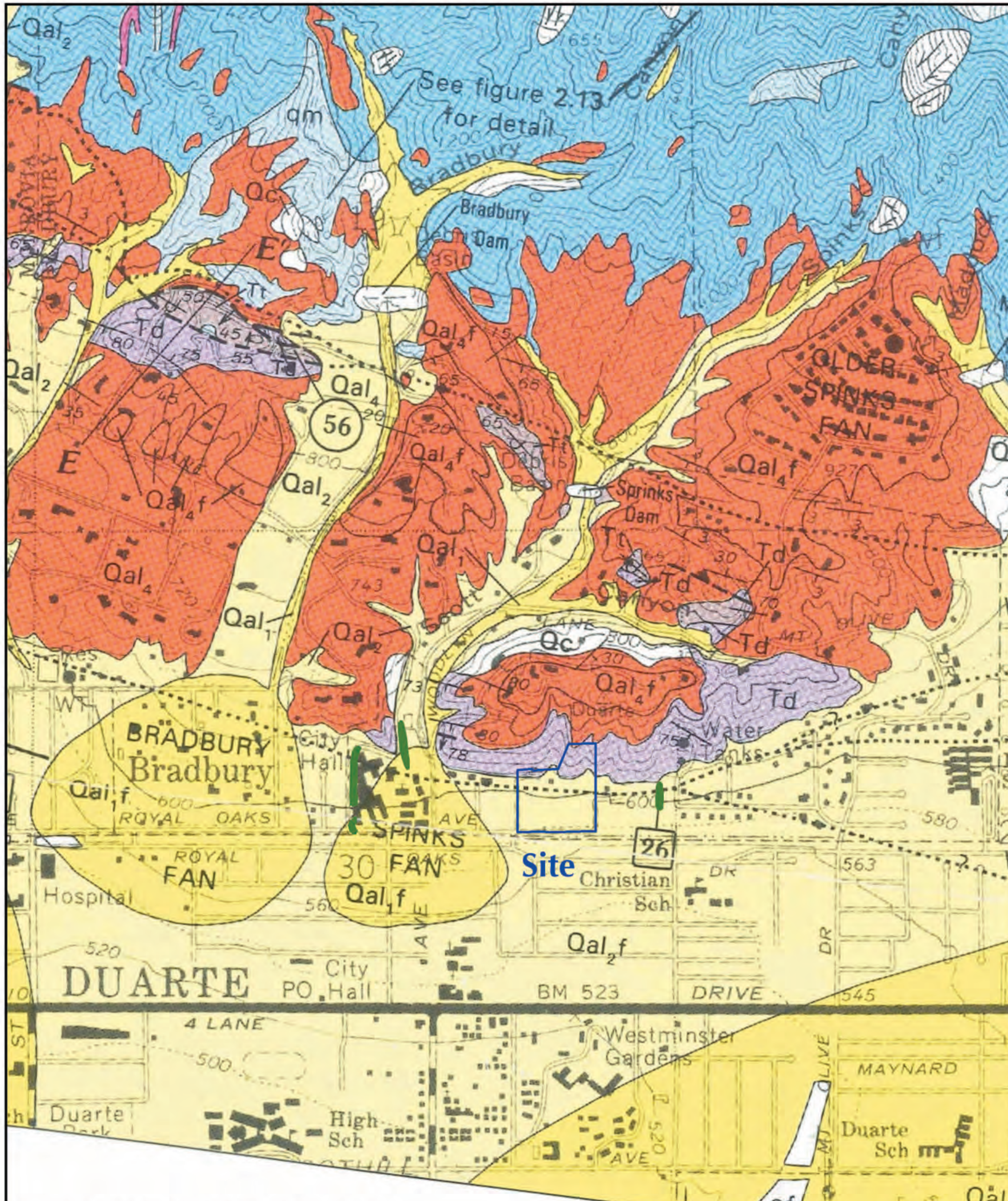
Approximate Site Location Relative to the San Gabriel Basin and the Faults Bounding the Basin
(Figure also shows the base of the Fernando Formation in the Basin)

Figure 3



Source: Modified from Crook et al. (1987)

EXPLANATION

Geologic Units (from youngest to oldest)

Qc Colluvium (Holocene) – Talus and slopewash, generally brown to reddish brown, poorly sorted, heterogeneous deposits of locally derived debris. These deposits are more abundant than indicated on the map but are generally too small to show.

Qal1 Unit 1 Alluvium (Holocene) – White to light gray unconsolidated fine to coarse sand and gravel containing abundant cobbles and boulders; includes deposits of present stream channels, flood plains, and alluvial fans (now mostly controlled by flood-control channels and dams). Qal1f = alluvial fan surface.

Qal2 Unit 2 Alluvium (Holocene) – Gray to pale brown unconsolidated fine to coarse sand and gravel containing abundant cobbles and boulders; includes deposits of stream terraces, recently abandoned flood plains, and alluvial fans with incipient soil. Qal2f = alluvial fan surface.

Qal4 Unit 4 Alluvium (Pleistocene) – Red to reddish brown or yellow unconsolidated to well-consolidated fine to medium sand and gravel containing few to many cobbles and boulders; all clasts are highly weathered, and deposits have moderate to moderately high clay content and are commonly fractured or jointed; includes terraces and highly dissected and (or) buried fans with highly developed soils. Qal4f = alluvial fan surface.

Td Duarte Conglomerate (Pliocene?) – Tan moderately consolidated boulder conglomerate with well-rounded clasts and a clayey sandy matrix.

Tt Topanga Formation (Miocene) – Tan to brown or reddish-brown, interbedded conglomeratic sandstone, sandstone, and shale.

qm Quartz Monzonite and Granodiorite (Cretaceous) – Gray to tan fine to medium-grained intrusive rocks.

wd Wilson Diorite of Miller (1934) (Cretaceous) – Gray hornblende-biotite-quartz diorite.

Symbols

Fault: Showing dip. Dashed where approximately located; dotted where concealed; queried where inferred.

Strike and Dip of Stratified Rocks:

73 Inclined Overturned

Trench: Approximate location of trenches excavated and logged by others in the site vicinity (from Treiman, 2013, 2014). See text for more information.

N W E S

1000 0 1000

Feet

Scale: 1:12,000

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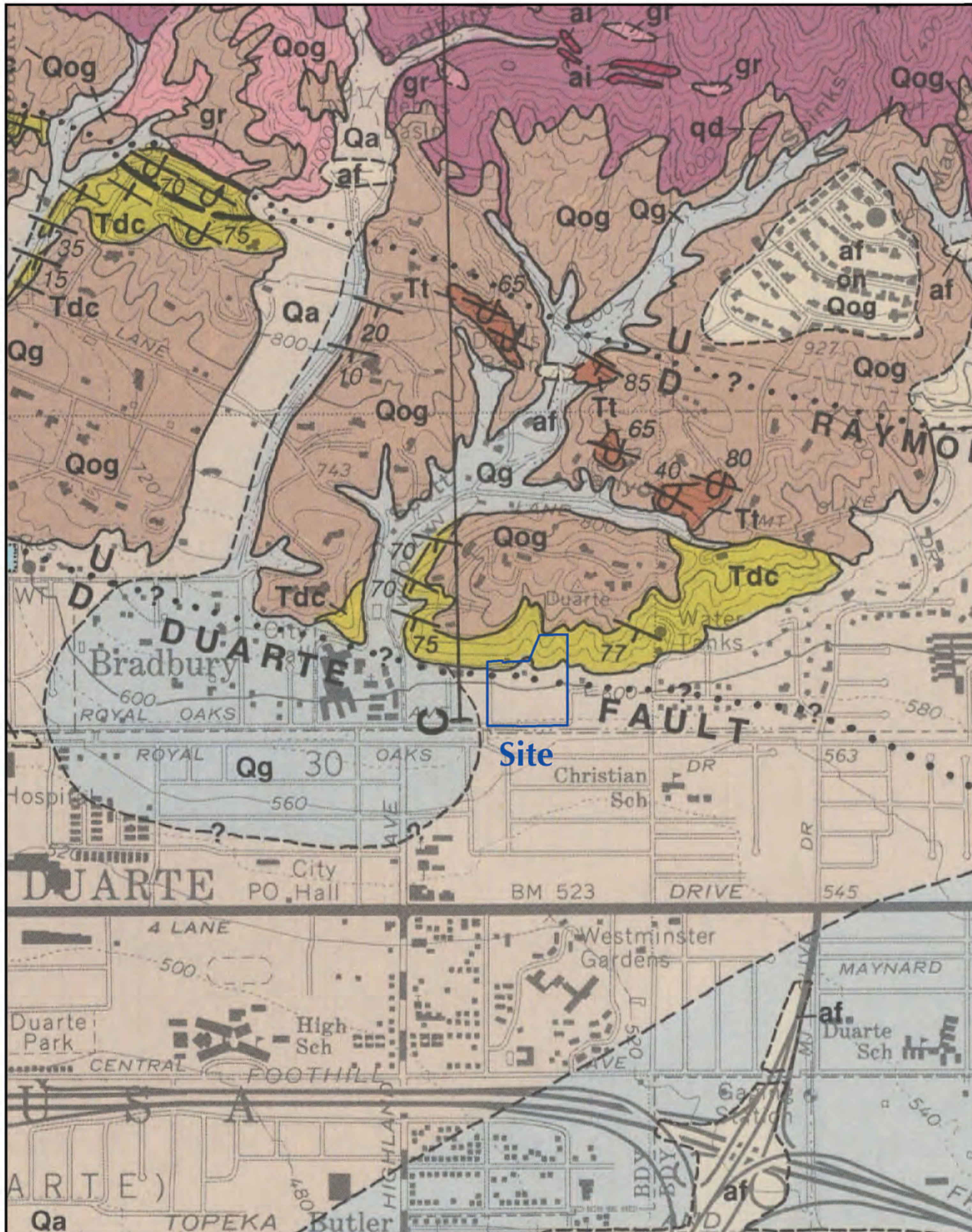
Project Number: 3509
Date: 2015

Geologic Map by Crook and Others

1901 Royal Oaks Drive,
Bradbury, California

Figure 4



EXPLANATION

Geologic Units (from youngest to oldest)

af	Artificial fill; not all areas shown
Qg	Gravel and sand of major stream channels and alluvial fan outwash from major channels
Qa	Alluvial gravel, sand and silt of valley areas
Qog	Elevated remnants of fan gravel and sand, includes San Dimas formation
Tdc	Duarte Conglomerate: gray, weakly indurated, vaguely bedded alluvial cobble conglomerate of mostly granitic and gneissic rocks
Tt	Topanga (?) Formation: tan to light gray moderately indurated fine to coarse grained sandstone
ai	dike rocks: thin dikes of light to medium gray-brown dacite to andesite
gr	granitic rocks, gray-white, medium- to fine-grained massive granitic rocks
qd	quartz diorite, gray, medium-grained, somewhat incoherent where weathered

Symbols

U ? D

Fault: Dashed where indefinite or inferred, dotted where concealed, queried where existence is doubtful. Relative vertical movement is shown by U/D (U = upthrown side, D = downthrown side).

Strike and Dip of Stratified Rocks:

Inclined vertical Overturned

N W E S

1000 0 1000
Feet

Source: Dibblee (1998)

Scale: 1:12,000

Earth Consultants International
Project Number: 3509
Date: 2015

Geologic Map by Dibblee

1901 Royal Oaks Drive,
Bradbury, California

Figure 5

Deep in the subsurface, the Duarte fault is imaged as a "moderately north-dipping" low-velocity zone and buried scarp that offsets velocity reflectors approximately 8,200 feet (2,500 meters) and extends at least 3.1 miles (5 km) into basement rocks, based on a deep seismic profile conducted as part of the Los Angeles Region Seismic Experiment (LARSE) (Fuis et al., 2001; Lutter et al., 1999). Shallower in the subsurface, the location of the fault has been inferred from steps in the depth to groundwater reported by the California Department of Water Resources (1966) and compiled by Crook et al. (1987). More recently, to the east of the San Gabriel River, in the Azusa area, geotechnical studies at Citrus College have shown the presence of a groundwater barrier and cascade that is presumed to coincide with the subsurface location of the fault (M&T Agra, 1993; Geobase, Inc., 2005, 2006a, 2006b, 2007; as reported in Treiman, 2013). We suggest, however, based in part on a review of aerial images of the region, that the changes in the depth to groundwater may be associated with the westward incision of a proto-Dalton Wash canyon during a low sea level stand, rather than faulting. Groundwater would collect at the bottom of the now-filled in canyon that was incised into the surrounding older alluvium in response to a glacial maximum, or perch on top of clay-rich layers filling in the old drainage. Similar groundwater depth anomalies in the Hollywood area originally assumed to be fault-related have been found to be associated with older, incised canyons, indicating that changes in groundwater depth need not be fault-controlled (Group Delta, 2015).

Geomorphic characteristics suggestive of the Duarte fault include "diffuse linear zones of steepened gradient" . . . and the "steep and abrupt front to the elevated piedmont surface on which much of the city of Bradbury is developed" (Treiman, 2013). According to Crook et al. (1987), incision of the older Holocene Qal2 surface north of the fault and deposition of young Holocene Qal1 deposits south of the fault indicate relatively recent fault activity (refer to the young fan surfaces on Figure 4). However, the locations where incision stops and deposition begins are north of the inferred trace of the fault and the presumed location where uplift has occurred as a result of reverse movement on the Duarte fault. The Qal1 and Qal2 surfaces do not show any geomorphic evidence of deformation, such as tilting or steepened gradient. These observations indicate that the drainages responsible for deposition of these units are not "seeing" the fault, and thus that the last movement on the fault, if present in this area, pre-dates deposition of these sediments. Given that the Qal2 unit is considered to be up to 11,000 years old, and that there is no 11,000- to 200,000-years-old Qal3 unit mapped in this area that can be used to assess its late Pleistocene tectonic history, it is possible that movement on the Duarte fault, if the fault indeed is present in the subsurface in this area, last occurred in the Pleistocene, more than 11,000 years ago. If that is the case, then this fault is not active.

Based on data presented in Treiman (2013), prior to this study, only two trenching studies conducted in the site vicinity across the mapped trace of the Duarte fault have been reported in the literature. The first of these, described in Crook et al., (1987), where it is referred to as site 26, was located immediately east of the property addressed in this report (see Figure 4). The study at site 26 consisted of a trench (their trench 19) that was excavated and logged in December 1977 by CalTech graduate students. The trench reportedly varied in depth between 6 and 17 feet, and exposed Duarte Conglomerate at the north end of the trench, and locally at its bottom. The bedrock was reportedly locally sheared, but the shears did not extend upward into the overlying colluvial sediments, and Crook et al. (1987) reported that no faulting was observed in the trench. Treiman (2014), however, considers this study inconclusive because Crook et al.'s description of the sediments "implies deposits that are too young to preclude

Holocene faulting." Furthermore, according to Treiman (2014), the unpublished field notes include a possible fault in the colluvium, near the south end of the trench, that was reportedly observed by an undergraduate assistant. That Crook et al. (1987) chose not to show this "possible" fault in the final description of the trench, as discussed in their report, suggests that they did not concur with the undergraduate assistant and did not observe or interpret a fault there.

The second, more recent study is west of the study site, at the mouth of Scott Canyon, where LeRoy Crandall and Associates (1989) excavated a 360-foot long trench as part of a fault location study for a proposed nursing facility (see Figure 4). Additional trenching at this site was conducted by Jerry Kovacs and Associates in 1997, who reportedly excavated five overlapping trenches in the southern portion of the property that shadowed the 1989 trench. The first trench exposed Duarte Conglomerate sporadically along its base in the northern approximately 160 feet, in addition to "better consolidated Holocene alluvium." The southern 200 feet of the trench reportedly exposed only young, poorly consolidated sediments. The 1997 trenches, which were up to 11 feet deep, exposed sediments considered to be Holocene in age. We suggest that the "better consolidated" alluvium may have in fact been older, as Holocene alluvium is not typically consolidated or semi-consolidated. Given this site's location at the mouth of a canyon, it is certainly expected that the sediments in the southern portion of the site would be young. Thus, we do agree that the studies at this site may have been inconclusive regarding the location and activity of the Duarte fault.

Given that none of the paleoseismic studies conducted across the mapped trace of the Duarte fault have found the fault, there are no data currently available on the fault's earthquake history, recency of activity, kinematics, or rate of slip. It is our understanding that our study is the first fault investigation conducted in the city of Bradbury since the APEFZ map zoning this segment of the Duarte fault was issued (Mr. David Gilbertson, City of Bradbury Engineer, personal communication).

2.3 Previous Geotechnical Studies Conducted by Others at the Site

Based on data provided to us by the current project engineer, a geotechnical review of the site was conducted in 1989 by Duco Engineering, Inc. (Duco). At the time, the proposed project consisted of subdividing the property into seven residential lots, and the geotechnical study evaluated the surface and near-surface soil conditions at the site to provide recommendations for grading of the property. The study by Duco included the excavation, logging and sampling of five test holes excavated with a backhoe to depths of between 6 and 10 feet. Relatively undisturbed and disturbed samples of soil were collected and analyzed in the laboratory for in-situ moisture, maximum density, expansion potential, and soil strength. Their report provided recommendations for site preparation, foundation support, retaining walls, and cut and fill slopes. The proposed project was deemed feasible from a geotechnical standpoint. The study did not include a fault evaluation as the fault that had already been inferred through the site by Crook et al. (1987) had not been zoned by the State as sufficiently active and well-defined. In 1991, Duco conducted a slope stability analysis for the site in support of a debris basin that was proposed at the site, and in 1992, additional analyses were provided in response to a review sheet received from the County of Los Angeles Department of Public Works regarding a proposed storm drain.

More recently, in March 2015, and in support of the current proposed development as described in Section 1.3, the geotechnical conditions at the site were reviewed and analyzed by Cal Land Engineering, Inc. dba Quartech Consultants (CLE). Their study included the excavation, logging and sampling of twelve backhoe test pits that were between 5 and 9 feet deep. CLE provided us with copies of their preliminary test pit logs, but we did not review their final geotechnical report. It is our understanding that while doing their study, the geotechnical engineers realized that the site is now located within an Alquist-Priolo Earthquake Fault Zone, and contacted us to provide the fault investigation services described herein.

2.4 Using Soils for Age Estimations

Undisturbed, in-situ organic materials such as charcoal that could be used to obtain an absolute age of the sedimentary deposits were not encountered in the trenches. We considered collecting samples of the sediments for analysis using the Optically Stimulated Luminescence dating method, but none of the laboratories that we contacted could provide us with results in a timely manner. As a result, we relied on non-absolute dating techniques to estimate the age of the sediments exposed. Specifically, we used soil development and clast weathering as indicators of the age of the sediments. Clast weathering is described in Section 2.5, whereas the use of soil development for age estimations is described further below.

The term soil as used here refers to a natural body of mineral and/or organic material consisting of layers (or horizons) that are different from the underlying geologic material in their "morphological, physical, chemical and mineralogical properties and their biological characteristics" (Birkeland, 1984). These differences are the result of weathering and the effects of five main soil-forming factors: parent material, climate, slope or topography, organisms, and time (Jenny, 1941). Time is an important factor because the longer a geologic deposit is exposed to the effects of weathering and soil formation, the better developed the soil characteristics become. We take advantage of this factor when using soils to estimate the age of the deposits.

Soil development occurs on stable geomorphic surfaces (a stable surface is one that is not significantly impacted by deposition or erosion). Soil development typically starts to occur as soon as a surface stops being eroded or deposited on. Therefore, in some environments, such as an alluvial plain or alluvial fan, it is common to find several weak to moderately well developed buried soils that rest one upon the other, sometimes separated by unaltered sediments (the parent material). The soils represent periods of sub-aerial weathering and soil formation that occurred in between periods of alluvial erosion and deposition. The age of the underlying primary deposits is estimated by summing the age of the individual overlying buried soils, recognizing that the soil-age estimates will provide a minimum age for the parent material, as the estimated ages do not account for the length of time it took for the sediments to be deposited. Furthermore, if portions of soil horizons, or even entire soil horizons, have been removed (truncated) from the area by erosion, that soil's data are no longer available for analysis and the age estimates will not include that period of soil formation, resulting in a potentially significant younger age estimate. Nevertheless, if these limitations are recognized, soils developed in fluvial or alluvial fan environments can provide useful information. In areas where suitable datable materials such as charcoal are not available or cannot be trusted due to intense bioturbation and mixing, soil-age estimations are particularly useful.

We described the near-surface and buried soils observed in the trenches excavated for this study using a combination of the characteristics and nomenclature established by the Soil Survey Staff (1975, 1992), the National Soil Survey Center (2012), and Birkeland (1984, 1999). Colors of the soil horizons were recorded by comparing the color of the matrix, mottles and clay films both in the dry and wet states to color chips in a Munsell Soil Color Chart. Characteristics that we recorded include: 1) texture, i.e., grain size distribution, including the presence of gravel, pebbles and cobbles, 2) structure, i.e., whether the soil mass breaks into distinctive peds, or is single-grained, 3) the amount, distribution and thickness of translocated clay forming films or stains on the soil ped faces and clasts, in pores, and in between sand grains (called bridges), 4) the looseness or induration of the soil peds when dry and moist, and 5) the stickiness and plasticity of the wet soil. Where the pebbles, cobbles and boulders showed signs of weathering, we also noted that information following McFadden et al.'s (1982) clast weathering criteria (see Section 2.5). Finally, the sharpness and relief characteristics of the contact (or boundary) between horizons were also noted. The soil descriptions are provided on the trench logs (Plates 1 and 2) and are summarized and discussed in Section 3.2.

To estimate the age of geologic deposits using soil-stratigraphic techniques we rely on a comparison of the characteristics of the soils in question with those of other soils in the region developed in similar parent materials that have been dated using both absolute and relative dating methods. For this quantitative comparison, the characteristics of the soils are assigned numerical values that are then used to calculate the soils' degree of development. We used two of these quantitative methods for this study: Harden's (1982) Soil Development Index (SDI), and Ponti's (1985) Maximum Horizon Index. The SDI values were then normalized to a depth of 200 cm to compare the results to equally normalized SDI values presented in the literature and in the regressions used. Both SDI and MHI values have been shown to be useful relative indicators of soil age, with older, better developed soils having higher SDI and MHI values (Harden, 1982; Harden and Taylor, 1983; Rockwell et al., 1984; Rockwell et al., 1990; Bornyasz and Rockwell, 1997). To obtain minimum age estimates for the soils described, we compared the soils' SDI and MHI values with the soil age regressions presented in Dolan et al. (1997), which are based on the chronosequences by Rockwell (1983), Rockwell et al. (1985), Harden (1982), and McFadden and Weldon (1987).

In these quantitative assessments, the characteristics of the parent material are "subtracted" from the characteristics of the soil being analyzed to develop a realistic estimate of the length of time that a geologic deposit has been subject to the effects of weathering and soil formation. Field studies have shown that all other conditions being equal, a soil developed in fine-grained sediments is better developed, with increased horizonation and illuviation, than a coarse-grained soil of similar age (Rockwell et al., 1985). We accounted for these differences when estimating the ages of the soils, as described below.

Review of the trenches indicates that two main sedimentation processes have occurred in this area: 1) fluvial deposition consisting of fining-upward sequences of gravelly sand and sand of differing grain sizes, and 2) alluvial fan or alluvial apron deposition consisting of poorly sorted to coarsening-upward mudflow or debris flow sediments that include gravel, cobbles and boulders up to a few feet in diameter. Some of the fluvial sections observed in the trenches may have been deposited in one single flood event, whereas others are bedded, with alternating sequences of coarse-grained and fine-grained sediments that suggest several flood events. The unaltered primary geologic unit that constitutes the parent material for the soils at the site appears to be predominantly sand, as observed and described at several locations (refer to Plates 1 and 2). However, to account for the potential minor concentration of finer-grained silt and clay, especially in the debris flow deposits, we used a loamy sand as the parent material. The ages that we have calculated are thus conservative and slightly younger than if we had used sand as the parent material. The SDI and MHI values calculated for the soils described for this study, and the age estimates provided by each method are summarized in Section 3.2.

The age estimates we calculated essentially indicate the approximate length of time that each of the soils observed in the trenches was exposed to soil-forming processes at the surface prior to burial. The soil regressions provide a median age estimate, and minimum and maximum values that capture 95 percent of the data used to generate the equations. To estimate the age of the entire section exposed in the trenches, we added the soil-age estimates calculated for each soil (that is, the surface soil and the buried soils we observed). This method provides a minimum age for the section, recognizing that this estimate does not account for the length of time it took for the sediments to be deposited, nor does it include any soils since removed by erosion that are no longer present in the record. In an effort to be as conservative as possible in our age estimates, we opted to use the average of the age estimates provided by the MHI and SDI (normalized and non-normalized) methods, and emphasize the minimum and median age estimates obtained. As shown in Section 3.2, even skewing the results toward the young end of the spectrum, we show that the trenches for this study exposed Pleistocene-aged sediments at depth.

2.5 Clast Weathering Stages as Age Indicators

General estimates of the age of the deposits were also made using the degree of weathering of pebbles, cobbles and boulders exposed in the different geologic units observed in the trenches. McFadden et al. (1982) defined cobble-weathering stages that can be used to estimate the approximate age of the deposits containing the cobbles. Simply put, older sediments have more weathered clasts. The clast weathering stages and age estimates defined by McFadden et al. (1982) are described below. Observations regarding the degree of weathering of the clasts are included in the trench logs and are summarized as appropriate in Section 3.1.

Stage 1: Unweathered bedrock, rings sharply to blow of hammer. Mafic rocks exhibiting Stage 1 weathering characteristics are estimated to have been exposed to weathering agents for less than about 1,000 years. Leucocratic (light-colored igneous rocks) exhibiting Stage 1 characteristics are thought to have been exposed to weathering agents for less than about 4,000 years.

Stage 2: Slightly weathered bedrock, incipient to moderate surface pitting, fractured, with oxidation rinds greater than 1-2 mm in thickness, yields moderate ring to blow of hammer. Stage 2 mafic rocks have been exposed to weathering agents for about 4,000 years, whereas Stage 2 leucocratic rocks could have been weathering for as much as about 10,000 years.

Stage 3: Substantially weathered bedrock, surface highly pitted, strongly fractured, mafic minerals and feldspars may be strongly altered, clasts can be broken with difficulty by hand, dull sound to blow of hammer. Stage 3 mafic rocks are estimated to have been exposed to weathering agents for 10,000 to 75,000 years; Stage 3 leucocratic rocks could have been weathering for as much as 400,000 years.

Stage 4: Very strongly weathered bedrock, easily disaggregated by hand into grus; very dull sound when struck with hammer. Stage 4 mafic rocks have weathered for more than about 75,000 years; Stage 4 leucocratic rocks have weathered for more than 400,000 years.

3.0 FINDINGS

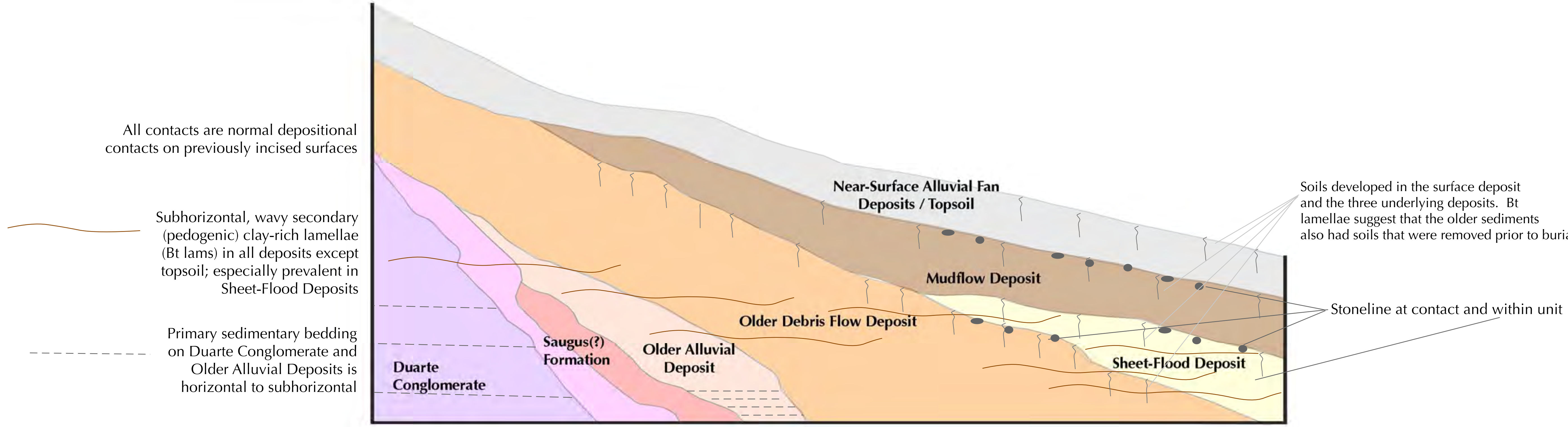
3.1 Geologic Units

The geologic units exposed in the trenches excavated and logged for this study include artificial fill, several alluvial and colluvial deposits including mudflows or debris flows, and unconsolidated to consolidated sediments assigned to the Saugus(?) Formation and Duarte Conglomerate. Several of these geological deposits have been modified by pedogenic processes and have soils developed in them. Generalized descriptions of the geologic units and soils exposed in the trenches are provided below, from oldest to youngest, and a stratigraphic column summarizing these units is provided in Figure 7. For a more detailed description of the geologic deposits and soils exposed in each trench refer to the trench logs in Plates 1 and 2.

3.1.1 Duarte Conglomerate (shown in light purple on Plate 1)

The north end of Trench 1a was excavated into the base of the steep hillside that defines the northernmost portion of the site. The geologic deposit exposed in this area consists of consolidated sandstone, gravelly sandstone and conglomerate with rounded to subrounded, weathered clasts of diorite, gneiss, and other lithologies. The clasts exposed in the trench were up to 2.5 feet long, and very strongly weathered, to Stage 4, as defined in Section 2.5. Moderately well-defined bedding could be discerned from the exposure in Trench 1a; the beds were horizontal to subhorizontal, indicating that at this location, this unit has not been deformed by folding or faulting (Photo 6). This observation is significant given that previous researchers have shown the bedrock underlying the Bradbury piedmont as being strongly deformed, with steep dips of between 70 and 77 degrees to the south, although the bedding measurements shown are generally to the north and west of the site (see Figures 4 and 5).

All geologic maps reviewed show Duarte Conglomerate in this area (Crook et al., 1987; Dibblee, 1998; Morton and Miller, 2006). Our description of the unit exposed at the north end of Trench 1a is consistent with their descriptions for the Duarte Conglomerate. Yeats (2004) indicates that in the western part of the San Gabriel Basin, the deep-water Fernando Formation changes facies to a largely non-marine sequence that includes conglomerate assigned to the Duarte Conglomerate. This unit crops out at the base of the San Gabriel Mountains, where Shelton (1955) showed it to be almost 1,500 feet (450 m) thick. The Duarte Conglomerate is considered to be late Tertiary in age, possibly Pliocene, and up to 2.4 million years old (Yeats, 2004).



Geologic Unit	Estimated Age	Generalized Description	Soil Profile Developed Therein
Near-Surface Alluvial Fan Deposits / Topsoil	>3,800 years old, with a median age of 11,900 years, and possibly up to 38,000 years old.	SANDY LOAM, **LOAM** and **SANDY CLAY LOAM** grading downward to **GRAVELLY SANDY CLAY LOAM**; brown (10YR 4/3 to 7.5YR 5/4) when dry, very dark brown, dark brown and very dark grayish brown (10YR 2.5/2 to 7.5YR 3/3) when moist; moderate fine to coarse subangular blocky and granular soil structure; few thin clay films on ped faces and bridging grains in A horizon; common thin and few moderately thick clay films bridging grains, many thin clay films on ped faces, many thin to moderately thick clay films on ped faces, and continuous moderately thick clay films in clast pockets in Bt horizon; organics-rich; rounded clasts to 3-inches in diameter.	A, A/Btj or A/Bt
Mudflow Deposits	>4,200 years old, with a median age of 25,200 years, and possibly up to 80,000 years old.	GRAVELLY SANDY CLAY, LOAMY SAND and **SANDY LOAM**; brown (7.5YR 5/4), dark brown to brown (7.5YR 3.5/3); moderate to strong coarse angular blocky soil structure; very hard to extremely hard when dry; many thin and few thick clay films on clasts, many thin clay films bridging grains, many thin clay films in pores; dark reddish brown (5YR 3/4 when moist) Bt lamellae; subangular to rounded gravel and cobbles to 6-inches in diameter weathered to Stages 2 to 4.	Bt
Sheet-flood Deposits	>15,500 years old, with a median age of about 51,000 years, and possibly up to 160,000 years old.	SANDY LOAM, **SANDY CLAY LOAM**, and **SANDY CLAY** to **CLAY**; brown (7.5YR 5/4) when dry, brown (7.5YR 4/4 when moist; weak to moderate fine to medium subangular blocky soil structure; few thin clay films on ped faces, common thin and few moderately thick clay films bridging grains, many to continuous moderately thick clay films on clasts; with dark reddish brown (5YR 3/3 when wet) Bt lamellae; subrounded to angular clasts weathered to Stages 2 to 4.	A/Bt/BC/Clam
Older Debris Flow	>20,000 years old, with a median age of about 64,000 years, and possibly up to 200,000 years old	SANDY CLAY LOAM to **SANDY CLAY**; brown to yellowish brown (7.5-10YR 5/3.5 to 5/4) when dry, dark brown to brown (7.5YR ¾ to 4/4) with dark reddish brown (5YR 3/3) clay films when moist; moderate medium angular to subangular blocky soil structure; common thin clay films on ped faces, many thin and common moderately thick clay films bridging grains, common thin clay films in pores, many thin and common moderately thick clay films on clasts; Bt lamellae ¼-inch thick spaced about 1 to 1.5 inches apart; many pores; clasts near top of unit weathered to Stages 3 to 4.	Bt
Older Alluvium	>200,000 years old	Bedded fine to coarse **SAND, SANDY GRAVEL** and **LOAMY SANDY GRAVEL** grading upward to massive **SAND to LOAMY SAND** with cobbles weathered to Stage 4; light yellowish brown (10YR 6/4) when dry, dark brown to dark yellowish brown (10YR 3.5/4 and 4/4) when moist; single-grained; with Bt lamellae ¼- to ½-inch thick, spaced 1 to 2 inches apart.	No soil horizons remained; with Bt lamellae
Saugus(?) Formation	Up to 1.8 million years old	SILTY SANDSTONE with rounded gravel and pebbles to 3-inches in diameter; yellowish brown (10YR 5/4) with reddish brown (5YR 4/4) mottles when dry, dark yellowish brown to brown (10-7.5YR 4/4) when moist; dense; continuous thick clay films on clast pockets, many thin and common moderately thick clay films on clasts; with Bt lamellae. Capped by **SILTY CLAYSTONE**; strong brown (7.5YR 5/6) when dry, reddish brown (5YR 4/4) when moist; strong medium angular blocky soil structure; very hard to extremely hard when dry, sticky and plastic when wet; many thin to moderately thick and few thick clay films on ped faces, many thin clay films in pores, many to continuous clay films bridging grains, continuous moderately thick to thick clay films on clasts and in clast pockets; clasts are weathered to stage 4.	Silty claystone appears to be a buried Bt horizon
Duarte Conglomerate	Up to 2.4 million years old	Fine to coarse **SANDSTONE** and **GRAVELLY SANDSTONE** with subrounded boulders to 2.5-feet in diameter weathered to Stage 4; brown and yellowish brown (10YR 5/4 and 6/4) when dry, brown (7.5YR 4/4 and 5/4) when moist; very dense; with dark reddish brown (5YR 3/4 when wet) Bt lamellae up to 1-inch thick, spaced about 4 to 5 inches apart, with common thin clay films bridging grains.	No soil observed; with Bt lamellae

Generalized Stratigraphic Column and Structural Relations Observed in the Trenches

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Earth Consultants International

Project Number: 3509
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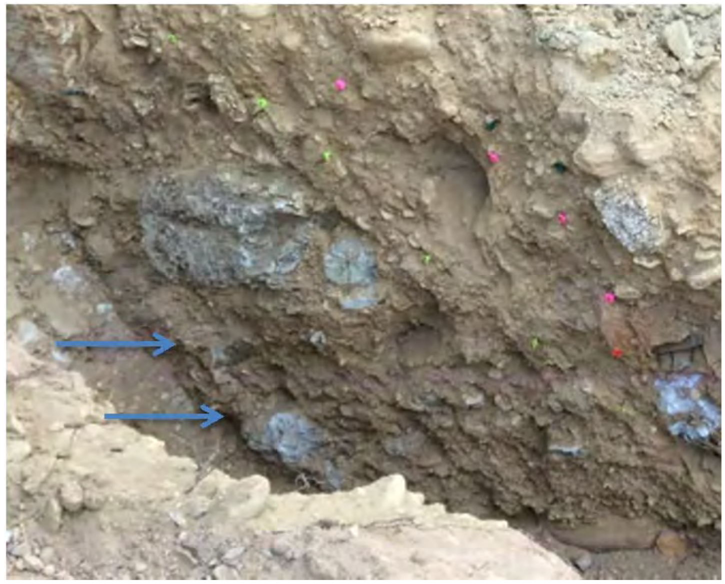
Figure 7

Photo 6: View of the north end of trench 1a showing the geologic unit that we interpret as the Duarte Conglomerate. Note the large weathered rounded to subrounded boulders and the roughly horizontal to subhorizontal bedding (blue arrows). The light green and pink flags denote the bottom and top, respectively of the massive silty sandstone overlying the conglomerate. These south-dipping, contacts were irregular, with no evidence of shearing or gouge to indicate faulting.



3.1.2 Saugus(?) Formation (shown in pink and light red on Plate 1)

Also in the northern portion of the trench, at the bottom, between stations 0 and 10, unconformably deposited on top of the Duarte Conglomerate, we observed a sequence of sandstone and silty claystone that, based on its characteristics, appears to correlate with the exposures of possible Saugus Formation ("alternating beds of relatively clean sandstone, pebble- to cobble-size conglomerate, and red siltstone") described by Crook et al. (1987) in the Ruby Canyon – Monrovia Canyon area, about 2 miles to the west of the site. In Trench 1a these deposits included a bed of dense but friable, massive silty sandstone capped by a reddish brown silty claystone (Photo 7). The yellowish brown silty sandstone includes scattered rounded to subangular gravel and pebbles to 3-inches in diameter. Although internal, primary bedding was not apparent in the exposure, clay-rich lamellae (referred to as Bt lamellae or lams) that have formed as a result of secondary, pedogenic processes, were observed within the unit, especially toward its upper half. The lamellae were generally subhorizontal.

Photo 7: Close-up view of the possible Saugus Formation near Station 5 in Trench 1a, near its bottom, showing the sandstone and silty claystone layers comprising this unit. Although the matrix is fine-grained, gravel to pebble-sized clasts weathered to Stage 4 were observed in this deposit. Compare with Photo 6 and Plate 1.

Photo 8: Close-up view of the irregular, erosional contact between the reddish silty claystone assigned to the possible Saugus Formation and the overlying Older Alluvial deposits, at about Station 10, near the base of Trench 1a. Note the intensely weathered clasts in the Older Alluvium. Pink flags denote contact. White flag marks sediment sample location used to describe the claystone unit.

The silty claystone (Photo 8) has characteristics that indicate it was exposed to soil-forming processes for a long period of time, as evidenced by the strong angular blocky soil structure, and many to continuous clay films on ped faces, in pores, bridging grains and on clasts and clast pockets. The clasts observed within this unit were very strongly weathered; most could be disaggregated by hand into grus (Stage 4; see Section 2.5), consistent with this unit having been deposited and exposed to weathering processes for many tens to hundreds of thousands of years. This unit is considered Plio-Pleistocene in age, possibly about 1.8 million years old.

The contact between these deposits and the underlying Duarte Conglomerate was reviewed carefully; we found the contact to be irregular, with no evidence of shearing or gouge to suggest faulting or repeated movement (Photo 6 and Plate 1). The contact is south-dipping and listric, shallowing toward the bottom of the trench. We suggest that this contact could represent an old, thin-skinned, surficial landslide or shallow slump that occurred several hundreds of thousands of years ago, prior to the deposition of the alluvial and colluvial deposits described below. Alternatively, a thicker section of these sediments was deposited as a colluvial apron at the base of the hillside formed by the Duarte Conglomerate, with most of it subsequently removed by erosion before the older alluvial sediments described in Section 3.1.3 were deposited on top.

3.1.3 Older Alluvial Deposits (shown in light pink on Plate 1)

Buttressing and overlying the sediments described above, we observed the thin remains of an older alluvial deposit consisting of several horizontal to subhorizontal beds of well-sorted fine to coarse yellowish brown sand (channel deposits; Photo 9) overlain by a sand to loamy sand unit with gravel and cobbles (alluvial fan deposit; Photo 8). Primary sedimentary stratigraphy was observed in the beds near the bottom of the trench, between about stations 15 and 30 (Photo 9). The less well-sorted unit at the top was generally massive, but a few thin clay-rich, generally subhorizontal Bt lamellae were present. Bt lamellae were also present in the deeper fluvial deposits. The portion of this unit that remained was not modified extensively by pedogenic processes, but the exposure suggests that a significant thickness of this unit was removed by incision prior to the deposition of the overlying debris flow deposit. It is thus possible that this sedimentary deposit was capped by a soil, but that the soil has since been removed, leaving behind only the mostly unaltered, deeper sedimentary unit. The age of this deposit is unknown, but given that the clasts within it are extensively weathered, to Stage 4, we suggest that this unit is many hundreds of thousands years old, consistent with McFadden et al.'s (1982) age estimates using clast weathering stages, and possibly equivalent to, or even older than Crook et al.'s unit Qal4. Crook et al. (1987) estimated that their unit Qal4 is more than 200,000 years old.

Photo 9: View of the northeast wall of trench 1a, between stations 15 and 20, showing the older alluvial sediments exposed near the bottom of the trench (under and within the light yellow flags) against the reddish silty claystone of the Saugus? Formation (under pink flags). This photo is skewed, tilted down on the left, as indicated by the pink string in the middle of the photo that denotes a level, horizontal line. Also notice that many of the clasts in the coarser-grained Older Debris Flow Deposit are extensively weathered.

3.1.4 Older Debris Flow Deposits (shown in orange on Plates 1 and 2)

The next-youngest unit exposed in Trench 1a is a poorly sorted debris flow deposit that has been modified by soil-forming processes. This unit was exposed at the north end of the trench, where it overlies the Duarte Conglomerate and the other deposits described above, and along a significant portion of the bottom of the trench, as shown on Plate 1. This unit was also exposed at the bottom of Trench 1b (Photo 10).

This older debris flow deposit consists of gravelly sandy loam, sandy clay loam, to sandy clay, 7.5YR colors when dry and moist, with 5YR-hued clay-rich lamellae (Bt lamellae or Bt lams), common to many thin to moderately thick clay films, and clasts weathered to Stages 3 to 4. As expected, this unit is coarser grained at the northern end of the site, closer to the hillside (compare Photos 9 and 10). Based on the soil-age estimates we calculated for the profile exposed in Trench 1b, this deposit is thought to have a median age of about 64,000 years (with minimum and maximum age estimates of about 20,000 and 200,000 years, respectively, based on the lower and upper bounds of the envelopes that capture 95% of the data used to develop the soil age regressions used - see Table 2 in Section 3.2). Because the soil developed in this unit was truncated, and this and the overlying deposits show evidence of several periods where erosion dominated, these age estimates are considered minimum values. The degree of weathering of the clasts observed in this unit also suggests that it could be older.

Photo 10: View of the Older Debris Flow deposit at the bottom of Trench 1b at about Stations 30-32 (darker unit near the bottom, below the channel deposits). This unit has a significant concentration of secondary, pedogenic clay, and as a result, was easy to identify in the trenches. The pink string is the level line used as a reference to log the trench.

3.1.5 Sheet-Flood Deposits (shown in yellow in Plates 1 and 2)

The pedogenically altered debris flow deposits described above are overlain by a relatively thick sequence of finer-grained sediments that consist principally of sandy loam and fine to coarse sand. The unit appears to be predominantly massive, although nested channel deposits were observed locally within the deposit in Trench 1a (between stations 80 and 120, stations 150 and 180, and from about station 430 southward), and at the bottom of the unit in Trench 1b (channel deposits above the Older Debris Flow Deposit in Photo 10). Stonelines within this unit suggest that it was deposited by a series of sheet floods, rather than one flood event. Gravel and pebbles up to 4-inches in diameter were observed locally. The degree of weathering of these clasts varies between Stages 2 and 4. This unit was exposed from about Station 20 in Trench 1a southward to the southern property boundary, including in Trench 1b.

This deposit is characterized by wavy, clay-enriched reddish brown (5YR) lamellae typically ½- to 1-inch thick and spaced about 2- to 4-inches apart (Photo 11). The Bt lamellae extend laterally for tens of feet, and typically overlap. Bt lamellae (or lams) are thought to form at the bottom of the wetting front before an overlying argillic soil horizon develops further limiting the infiltration of water into the deeper part of the profile. In southern California, it is estimated that it takes approximately 5,000 years of near-surface exposure for Bt lamellae to form (Dr. Thomas Rockwell, personal communication). Bt lamellae are very useful secondary stratigraphic markers in fault investigations, especially when present in otherwise massive sediments, because they can help to highlight the zone of faulting, and can also be used to date the faulting event(s). For example, if the faulting pre-dates the formation of the lams, the fault plane often also acts as a barrier to the clay-enriched water, with the resultant deposition of reddish clay along the fault. If the faulting post-dates the formation of the Bt lamellae, these then show offsets that can be measured to determine the amount of movement and sense of displacement (Gonzalez, 1993). We reviewed the Bt lams along the full length of the trenches and did not find any evidence of these being offset or truncated by faulting, nor did we observe any Bt-lam-enhanced fault planes.

Photo 11: Close-up view of the sheet-flood deposits in the bottom bench of Trench 1a, at about Station 440, showing some of the clay-enriched Bt lamellae (arrows).

The Bt lams indicate that this sheet-flood deposit was exposed to soil-forming processes. An argillic (Bt) soil horizon was observed at the top of his unit in both trenches. The argillic horizon was capped by an A soil horizon of variable thickness in Trench 1b, and locally in Trench 1a, between Stations 20 and 30. As described in more detail in Section 3.2, the age of these sheet-flood deposits can be estimated by adding the time it took for this soil to develop when the geologic deposit was exposed at the surface, to the time it took to form all the overlying soils. Our estimate on the age of this unit is between about 15,500 (minimum) and 51,100 (median) years. Thus, this unit is Pleistocene in age, and consistent with Crook et al.'s (1987) Qal3 unit, although the soil observed in this unit is better developed than the soils described by them.

3.1.6 Mudflow Deposits (shown in brown in Plates 1 and 2)

The gently sloping portion of the site is underlain at relatively shallow depth by debris flow or mudflow sediments generated from the unstable slopes to the north during periods of intense rainfall. These deposits generally consist of poorly sorted, mixed fine- to coarse-grained sand with gravel, cobbles and boulders. Grain size typically decreases away from the mountain front, but the deposits can vary both laterally and vertically, with lenticular lenses or channel deposits that reflect the lateral migration of the high-energy braided streams that formed the coalescing alluvial fans. Randomly oriented pores that vary in size are reflective of the organic debris (including twigs, branches and leaves) that was incorporated into the mudflow sediment during transport and deposition, but that has since decomposed, leaving behind casts where the organic material used to be.

Photo 12: Close-up view of the pedogenically altered coarse-grained mudflow deposit observed in the middle bench of Trench 1a, at about Station 170. Notice the clay-coated clast pockets left behind on the trench wall.

Mudflow deposits in the near-surface were observed from about Station 10 southward to the southern end of Trench 1a, and along the full width of Trench 1b. The sediments consist of dark brown to dark reddish brown (7.5YR hues) gravelly to cobbly sandy loam to sandy clay loam (Photo 12), with subangular to rounded cobbles weathered to Stages 2 to 3.

An argillic soil horizon developed near the top of the unit was observed and described in both trenches. The degree of soil development represented by this now-buried argillic soil horizon as described in Trench 1b, combined with the age of the overlying surface soil, provides a minimum age for the mudflow deposits. This unit is estimated to be at least 8,000 years old (minimum age estimate), and possibly about 25,200 years old (median age estimate). The age of this unit could be older because the argillic soil horizon in Trench 1b that was used in the soil-age regressions has a loamy sand to sandy loam texture, whereas the argillic soil horizon preserved at the top of the mudflow unit in some portions of Trench 1a has a sandy clay loam texture. The finer-grained soil would give higher soil development index values that would return older age estimates.

3.1.7 Topsoil, Artificial Fill and Other Historical Deposits

We observed several near-surface deposits in both trenches, capping the older sediments described above. An organic-rich, dark brown, very dark brown to very dark grayish brown (10YR to 7.5YR hues) A soil horizon mantles the entire area. Starting at about Station 105 in Trench 1a, the A soil horizon is underlain by a weakly developed, dark brown (7.5YR hues) argillic soil horizon consisting of sandy clay loam. A similar, but more weakly developed argillic soil horizon was observed in Trench 1b, where we referred to it as a juvenile argillic (Btj) horizon (Photo 13). The modern soil is locally disturbed or mixed, the result of shallow excavations associated with the installation of plastic and metal irrigation pipes and concrete drainage pipes (Photo 14), and the felling of trees, leaving large roots behind. Large-sized fragments of charcoal were observed on top and within the A soil horizon. These are interpreted to be burnt fragments associated with a wildland fire that probably occurred in the past one or two decades in the site vicinity. Thick mats of organic debris consisting of horse manure and/or vegetation were exposed in the southern half of Trench 1a, starting at about Station 285. Finally, also predominantly in the southern portion of the site, as exposed in both trenches, the A soil horizon is covered with layers of light-colored soil that appear to have been imported or moved from elsewhere in the property.

Photo 13: Close-up view of the A and Btj soil horizons described in Trench 1b, at about Station 36. The top of the A soil horizon is defined by the 1-inch PVC pipe in the top center of the photo. The contact between the A and Btj horizons is etched into the trench wall, just above the pink level line.

Photo 14: View of the 2-foot wide concrete drain that we exposed at about Station 260 on the east wall of Trench 1a.

Because the historical deposits are not important to the conclusions of this investigation, we did not map them in great detail in our trench logs. The underlying surface soil, however, although weakly developed, has an argillic or juvenile argillic soil horizon that indicates the deposit that this soil is forming on has been at the surface for some time. Our estimates of the age of this soil, based on its characteristics as observed in Trench 1b, range from about 3,800 years (minimum) to 11,900 years (median). This age estimate is consistent with Crook et al.'s (1987) age estimate for their Qal2 deposit, which they mapped at the surface in the site vicinity, including the site proper (see Figure 4).

3.2 Soil-Age Estimates

Soil development, in the form of organic-rich A soil horizons, and clay-enriched, argillic (Btj and Bt) horizons were observed in the trenches excavated for this study. The presence of these soil horizons indicates that there have been relatively long periods of time, in the hundreds to thousands of years, when neither significant deposition nor erosion occurred on the valley floor, allowing these soils to develop. Essentially, these buried soils or paleosols represent prior surfaces of the valley floor, and the degree of soil development exhibited by each of these soils can be used to approximate the length of time that particular surface was exposed to soil-forming processes before it was buried by more recent alluvial fan, sheet-flood or debris flow deposition.

The soils we observed in the trenches developed within the stratified sequence of both fine- and coarse- grained sedimentary deposits described above. Soil formation within these deposits is represented by a stacked series of weak to moderately well developed soil profiles that rest one upon the other, locally separated by unaltered colluvial or alluvial sediments (the parent material). The soil age estimates we calculated provide a minimum age for the deposits that the soils formed into, especially in this environment, where portions of soil horizons, and sometimes even entire soil horizons appear to have been removed by erosion.

Trench 1b provided a fairly complete soil profile exposure that is also representative of the sediments and soils exposed in most of Trench 1a, as described in detail in Section 3.1 above. Not including the deposits assigned to the Duarte Conglomerate, the Saugus(?) Formation, and Older Alluvial Deposits described in Sections 3.1.1, 3.1.2 and 3.1.3, respectively, the site is underlain by sediments that, based on their soil characteristics, can be classified into four soils as follows: the soil currently at the surface that is actively developing, and three buried soils, each of which was at one time exposed at the surface. These soils, as observed in Trench 1b, are described further below, and their characteristics are summarized in Table 1.

The **surface soil** at the site has a weakly developed A/Btj profile. The A soil horizon has organic material mixed with the mineral fraction that gives it a dark brown, very dark brown, to very dark grayish brown color (with 10-7.5YR hues), especially when moist. Its texture varies from sandy loam to sandy clay loam. In many parts of the site, the A horizon has been modified by man-made activities associated with the past-uses of the site, such as the fruit orchard. Where this was apparent in the trenches, we labeled it as an Ap horizon in the logs (the "p" stands for plowed, but this suffix is also used for other man-made disturbances). The A horizon is typically about 40 cm (15 inches) thick.

The underlying juvenile argillic (Btj) horizon has a sandy loam, loam to sandy clay loam texture, dark brown to very dark brown (10YR to 7.5YR 3/2 to 2/2) colors, and common to many thin to moderately thick clay films. This horizon also has significant concentrations of organic matter, in addition to many roots and rootlets. The contact between this horizon and the underlying soil developed on an older surface is typically defined by a stoneline.

The presence of the juvenile argillic horizon indicates that this soil has been exposed to soil forming processes for at least a few thousand years, as it takes that long for an argillic soil horizon to develop in this region. Comparison with similar soils from southern California soils that have been dated indicates that this surface soil has been exposed to soil-forming processes for about 11,900 years (the average of the median ages computed using the soil's MHI, non-normalized SDI, and normalized SDI), with average minimum and maximum age estimates of 3,800 and 37,700 years, respectively (see Table 2).

The **first buried soil** observed in the trenches developed in a mudflow deposit (the unit described in Section 3.1.6). Only a section of an argillic soil horizon remained in Trench 1b (2Btb horizon). This horizon consists of loamy sand, sandy loam to sandy clay loam, dark brown to dark reddish brown in color (7.5YR hues), common to many thin and few moderately thick clay films, with rounded to subangular gravel, pebbles and cobbles weathered to Stages 2 to 3.

As above, the presence of an argillic horizon indicates that this soil was exposed to soil-forming processes at the ground surface for several thousands of years before it was buried. Comparison with similar soils that have been dated suggests that this soil took between about 4,200 (average of the minimum age estimates) and 13,300 (average of the median) years to develop before it was buried. By adding the age of the overlying soil to it, we estimate that the mudflow deposit that this soil formed in is between about 8,000 (minimum) and 25,200 (median) years old. The degree of weathering of the clasts is generally consistent with these age estimates.

The **second buried soil** observed in the trenches developed in a finer-grained sheet-flood deposit (described in Section 3.1.5). The soil that developed in this unit has a 3Ab/3Btb2/3BCb/4C_{lam} profile. In the trenches, this unit was characterized by the presence of subhorizontal, wavy clay-enriched lamellae (Bt lams) that extend laterally several feet. The A horizon capping this buried soil was observed in Trench 1b, and only locally in Trench 1a. The 3Ab horizon consists of very dark brown (7.5YR 2.5/3) sandy loam with weak subangular blocky and granular soil structure. This soil horizon has been overprinted by the overlying argillic soil horizon, and as a result, has common to many thin clay films. The underlying 3Btb2 horizon consists of dark brown to dark reddish brown (7.5-5YR ¾) sandy clay to clay, with moderate subangular blocky soil structure and common to continuous clay films. The underlying 3BCb horizon consists of dark brown to dark reddish brown sandy clay loam to sandy clay, with weak subangular blocky structure, many thin and few to common moderately thick clay films. A better-sorted fluvial deposit that is predominantly unaltered underlies the BC soil horizon in Trench 1b. We opted to group these units together, as the very limited soil development in the 4C_{lam} horizon contributed little to the overall age estimate for this second buried soil.

Table 1: Abbreviated Description of Soils Observed in Trench 1b

Horizon	Thickness (cm)	Texture	Color		Structure	Consistency				Clay Films	Comments
			Moist	Dry		Dry	Moist	Wet	Wet		
Surface Soil A	40	SL-L	7.5YR 3/2	10-7.5YR 5/4	sg	so-h	fri-slfi	so-ss	po-vsp	2nbr	Bioturbated, rootlets and root casts to 5mm
Btj	49	SL	7.5YR 3/2	7.5YR 4/2.5	1-2fsbk	sh	fr	so-ss	po-vsp	3-4ncl, 2npf, 3mkpo, 3n&2mkbr	Bioturbated; many roots and rootlets; lower boundary defined by stoneline
1st Buried Soil 2Btb	64	LS-SL	7.5YR 3/3 w/ 7.5YR 2.5/3 films	7.5YR 5/4 w/ 5YR 4/3 films	2-3csbk	sh	fr	so-ss	po	2ncl, 3nbr, 1npf, 2-3npo	Rootlets; cobbles weathered to stages 3-4
2nd Buried Soil 3Ab	52	SL	7.5YR 2.5/3	7.5YR 5/4 & 7.5YR 4/3	1fsbk-2fgr	so	Fri	so-ss	po	3n&2mkbr, 2npf, 2npo, 3-4ncl	Common randomly oriented pores to 3mm
3Btb2	46	SC-C	7.5-5YR 3/4	7.5YR 4.5/4	2msbk	vh-eh	slfi	s-vs	p	2mkpf, 4n&2mkbr, 3npo, 3ncl	Many randomly oriented pores to 3mm
3BCb	82	SCL-SC	7.5-5YR 3/3	7.5YR 3.5/4 w/ 5YR 4/3 films	1f-mbbk	vh-eh	fi	s	ps-p	3n&1mk-kpf, 3npo, 2k&3nbr	
4Clam	91	S	7.5YR 4/4	10-7.5YR 6/4	sg	lo	lo	so	po	1-2ncl	Few Bt lamellae
3rd Buried Soil 5Btb3	31+	SCL	7.5YR 4/4 w/ 5YR ¾ lams	10-7.5YR 5/4 w/ 5YR 3.5/4 lams	2mabk	h	fri	s	ps	2mkpf, 3n-mkbr, 2-3mkpo, 3ncl, 4mkbr in Bt lams	Mafic and dioritic clasts weathered to stage 3; few roots; pinhole-sized pores

ABBREVIATIONS:
TEXTURE: S = sand; LS = loamy sand; SL = sandy loam; L = loam; SCL = sandy clay loam; SC = sandy clay; CL = clay loam; Si = silt; SiL = silt loam; SiCL = silty clay loam; SiC = silty clay; C = clay. **STRUCTURE**: **Grade**: 1 = weak; 2 = moderate, 3 = strong. **Class**: 1f = very fine, f = fine, m = medium, c = coarse. **Type:** sg = single-grained; gr = granular, abk = angular blocky, sbk = subangular blocky. **CONSISTENCY**: **Dry**: lo = loose, so = soft, sh = slightly hard, h = hard, vh = very hard, eh = extremely hard. **Moist**: lo = loose, vfr = very friable, fr = friable, slfi = slightly firm; fi = firm, vfi = very firm, efi = extremely firm. **Wet**: ns = non-sticky, vss = very slightly sticky; ss = slightly sticky, s= sticky, vs = very sticky; np = non-plastic, vsp = very slightly plastic; sp = slightly plastic, p = plastic, vp = very plastic. **CLAY FILMS: Abundance:** 1 = few, 2 = common, 3 = many, 4 = continuous. **Thickness**: n = thin, mk = moderately thick, k = thick. **Location**: st = stains, cl = on clasts, clpo = on clast pockets, po = in pores, br = forming bridges between grains, pf = on ped faces.

This moderately developed and relatively well-preserved buried soil has characteristics that indicate that it was exposed to soil-forming processes for between about 8,500 (minimum) and 25,900 (median) years. Combined with the ages of the overlying soils, the sheet-flood deposit that this second buried soil developed in is estimated to be between about 15,500 and 51,100 years old. Longer periods of soil formation are possible, but we choose to emphasize the minimum and median age estimates provided by the soil-age regression equations to be conservative.

Table 2: Soil Development Age Estimates for Soils Observed in Trench 1b

Soil	Profile Index	Profile Index Value	Years Exposed to Soil Forming Processes	95% Predicted Age Confidence Interval		Approximate* Age of Section (years before present; minimum, median)
				Minimum (years)	Maximum (years)	
Surface Soil (A/Btj)	MHI	0.26	9,900	3,100	31,500	3,800; 11,900
	SDI (NN)	21.47	10,400	3,300	33,200	
	SDI (N-200)	46.15	15,400	4,900	48,500	
1st Buried Soil (2Btb)	MHI	0.28	11,400	3,600	35,700	8,000; 25,200
	SDI (NN)	18.49	9,900	3,100	31,700	
	SDI (N-200)	57.77	18,500	5,900	57,900	
2nd Buried Soil (3Ab/3Btb2/3BCb/4Clam)	MHI	0.48	32,500	11,000	94,900	16,500; 51,100
	SDI (NN)	71.53	23,100	7,400	71,500	
	SDI (N-200)	69.01	22,200	7,100	68,800	
3rd Buried Soil (5Btb3)	MHI	0.28	11,000	3,500	34,700	20,500; 63,700
	SDI (NN)	8.78	8,500	2,700	27,300	
	SDI (N-200)	56.67	18,200	5,800	56,900	
Estimated Age Entire Section	MHI		64,800	21,200	196,800	
	SDI (NN)		51,900	16,500	163,700	
	SDI (N-200)		74,300	23,700	232,100	

Abbreviations: MHI = Mean Horizon Index; SDI = Soil Development Index; NN = not normalized; N-200 = Normalized to 200 cm in thickness

* Approximate age calculated as an average of the three soil development indices calculated for each soil (that is, the average of the age calculated using the MHI, non-normalized SDI, and normalized SDI).

The **third** and deepest **buried soil** observed in both trenches developed in what we have referred to as the Older Debris Flow Deposit (described in Section 3.1.4). This unit was exposed at the bottom of both trenches, where it was easily recognized when we cleaned the trench walls because its high clay concentration made it significantly more resistant to scraping than the sediments above. Only a relatively thin portion of a truncated argillic soil horizon was exposed in Trench 1b, so the age estimates obtained for this unit are absolute minimums. The argillic soil horizon (5Btb3 horizon in Trench 1b) consists of brown (7.5YR 4/4) sandy clay loam with dark reddish brown (5YR ¾) lamellae, moderate angular blocky soil structure, with many thin and common to many moderately thick clay films. The clasts observed in this horizon were weathered to Stages 3 to 4, as described previously. The soil-age regressions suggest that this soil took between about 4,000 and 12,600 years to form (minimum and median age estimates, respectively). Combined with the ages of the overlying units, this deposit is estimated to be between 20,500 and 63,700 years old, but could be substantially older, as suggested by the weathered clasts.

4.0 INTERPRETATION AND CONCLUSIONS

Earth Consultants International conducted a fault study for the property at 1901 Royal Oaks Drive, in the city of Bradbury, to determine the potential for future surface fault rupture to impact the proposed re-development of the site. The site is within the Alquist-Priolo Earthquake Fault Zone (APEFZ) established by the California Geological Survey in 2014 for the Duarte fault, and as a result, this fault investigation was required before the site can be subdivided into eight residential lots. The Duarte fault is thought to be a southern element of the Sierra Madre Fault Zone, the principal fault at the base of the San Gabriel Mountains.

4.1 Interpretation of the Subsurface Conditions

To conduct this fault investigation we excavated and logged two trenches that extended in a southerly direction across the entire portion of the site that is to be developed, and at least 50 feet to the north of the most northerly proposed building footprint. The combined length of both trenches is approximately 540 feet. The trenches varied in depth between about 8.7 and 14.5 feet, with approximately 90% of the trench exposures exceeding 13 feet in depth.

The study area is underlain by a thick sequence of debris flow and fluvial (sheet-flood and channel) deposits consisting of poorly sorted gravelly to cobbly sand and loamy sand shed from the Bradbury piedmont and the San Gabriel Mountains to the north. Several discrete geologic units were recognized in the trenches, with the contacts between these units often defined by stonelines or soil horizons. The geologic deposits observed in the trenches extend unbroken across the area covered by this investigation. The contacts are typically wavy and clear. None of the contacts show evidence of shearing or gouge to suggest faulting.

Pleistocene-aged sediments were exposed in the bottom bench of both trenches, as determined from estimates of the age of the soils that have developed in them. The predominantly massive sheet-flood deposit observed along the bottom bench in both trenches is characterized by the presence of clay-enriched lamellae. We traced these lamellae laterally to look for evidence of fault-induced offsets or truncations that could have been otherwise masked in the massive sedimentary unit. We found no evidence for offsets or truncations in the lamellae. The contact between this massive unit and the overlying coarser-grained mudflow deposit is wavy, as expected given the high-energy environment of deposition, but again, this contact extends unbroken across the entire area investigated.

Older consolidated deposits possibly Plio-Pleistocene in age were exposed at the northern end of Trench 1a, at the base of the hillside that forms the northern portion of the site. These consolidated deposits, including the unit assigned to the Duarte Conglomerate that was exposed in the northernmost reach of Trench 1a, are not sheared, broken, tilted, or faulted; the beds in the Duarte Conglomerate and the Older Alluvial deposits at the bottom of the trench north of Station 30 are horizontal to subhorizontal. These observations indicate that these units have not been tectonically deformed in the site vicinity, contrary to the mapping by Crook et al. (1987) and Dibblee (1998) that show steep south-dipping beds of the Duarte Conglomerate to the north and west of the site. It is possible that deformation of the Bradbury piedmont is occurring to the north of this site, along some of the faults mapped by Treiman (2013) that are internal to the elevated surface. It is also possible, and the geomorphology suggests it, that the faults presumed to be responsible for uplift of the Bradbury piedmont are no longer active.

4.2 Conclusions

Based on the data presented above, we conclude the following:

- The study area is underlain by a thick sequence of debris flow and alluvial fan deposits of Holocene and late Pleistocene age. Conservatively, the sediments exposed in the bottom bench of our trenches are at least 20,000 years old, and most likely about 64,000 years old (Pleistocene in age). The sediments exposed in the middle bench could also be Pleistocene (16,500 to 51,000 years old). Thus, our trenches were deep enough to assess the potential for future surface fault rupture to impact the site, in accordance with standards of practice for fault investigations. These deposits, the contacts between them, and the soil horizons that have developed within these units are laterally continuous across the study area.

- The continuity of these primary and secondary layers indicates that there are no active faults underlying the area covered by this study, which includes the gently sloping portion of the site that is proposed for development, and the area at least 50 feet north of the northernmost proposed building footprint.

- Deposits at the base of the hillside that forms the northern portion of the site are thought to be older, possibly Plio-Pleistocene in age, and most likely correlative to the Duarte Conglomerate and possible Saugus Formation, as described by Crook et al. (1987). These deposits, where exposed in the northern portion of our Trench 1a, were not sheared, broken, tilted, or faulted, indicating that in this area, these sediments have not been tectonically deformed.

- Since Pleistocene-aged sediments in the study area are unbroken by faulting, it is our opinion that the potential for future surface fault rupture at the site (defined as the developable area of the project and the area 50 feet north of the northernmost proposed building footprint) is low to none. For this reason, structural setbacks to mitigate the hazard of surface fault rupture are not deemed necessary for the proposed project. The findings of this study apply only to the project depicted in Figure 2. Habitable structures should not be placed to the north of the area covered in this report without first conducting additional studies.

- Although the site is not impacted by faulting, it is located near several seismic sources that have the potential to generate strong ground shaking should they rupture in an earthquake. Moderate to strong levels of ground shaking should be considered in the design of the proposed structures, in accordance with the latest Building Code adopted by the City.

APPENDIX A: REFERENCES and SOURCES

APPENDIX A:
References and Sources

Birkeland, P.W., 1984, Soils and Geomorphology: Oxford University Press, New York, 372p.

Birkeland, P.W., 1999, Soils and Geomorphology, Oxford University Press, Inc., 3rd edition, 430p.

Bornyasz, M.S., and Rockwell, T.K., 1997, Towards A Multivariant Analysis of Over 150 Dated Soils From Central California to Northern Baja California: *Geological Society of America*, Abstracts with Programs, Vol. 29, No. 5, pp. 45.

Bryant, W.A. and Hart, E.W., 2007, Fault-rupture hazard zones in California: California Geological Survey Special Publication 42, 42p.
(available at ftp://ftp.consrv.ca.gov/pub/dmg/pubs/sp/Sp42.pdf).

California Department of Water Resources, 1966, Planned utilization of ground water basins, San Gabriel Valley, Appendix A: Geohydrology: California Department of Water Resources Bulletin No. 104-2, 230p., plus plates.

California Geological Survey (CGS), 2014, Earthquake Zones of Required Investigation, Azusa 7.5-Minute Quadrangle, Los Angeles County, California: Official Alquist-Priolo Earthquake Fault Zones Map released November 6, 2014.

Crook Jr., R., Allen, C.R., Kamb, B., Payne, C.M., and R.J. Proctor, 1987, Quaternary Geology and Seismic Hazard of the Sierra Madre and Associated Faults, Western San Gabriel Mountains, *in* Recent Reverse Faulting in the Transverse Ranges, California, U.S. Geological Survey Professional Paper 1339, pp. 27-63.

Dibblee, T.W., Jr., 1998, Geologic Map of the Mt. Wilson and Azusa Quadrangles, Los Angeles County, California, Dibblee Geological Foundation Map DF-67; Scale 1:24,000.

Dolan, J.F., Sieh, K., Rockwell, T.K., Guptill, P., and Miller, G., 1997, Active tectonics, paleoseismology, and seismic hazards of the Hollywood fault, northern Los Angeles basin, California: *Geological Society of America Bulletin*, Vol. 109, No. 12, pp. 1595-1616.

Dolan, J.F., Sieh, K., and Rockwell, T.K., 2000, Late Quaternary activity and seismic potential of the Santa Monica fault system, Los Angeles, California: *Geological Society of America Bulletin*, Vol. 112, No. 10, pp. 1559-1581.

Duco Engineering, Inc., 1989, Report of Soils Investigation, Tract Number 47642, City of Bradbury, California; Job No. 9-320, dated November 10, 1989.

Duco Engineering, Inc., 1991, Proposed Debris Basin, Tract No. 47642, Bradbury, California; Job No. 9-230 (sic), dated December 31, 1991.

Duco Engineering, Inc., 1992, Response to Geotechnical Review Sheet, Miscellaneous Transfer Drain No. 1338, Tract No. 47642, Bradbury, California; Job No. 9-320, dated February 28, 1992.

Eckis, R., 1934, Geology and ground water storage capacity of valley fill: California Department of Public Works, Division of Water Resources, Bulletin No. 45, South Coastal Basin Investigation, 279p., 6 plates. (as referenced in Treiman, 2013; not reviewed directly for this study)

Fuis, G.W., Ryberg, T., Godfrey, N.J., Okaya, D.A. and Murphy, J.M., 2001, Crustal structure and tectonics from the Los Angeles basin to the Mojave Desert, southern California: *Geology*, Vol. 29, pp.15-18, plus insert.

Geobase, Inc., 2005, Geotechnical investigation for Fine Arts/Communications, Citrus College, Glendora, California: unpublished consultant report, Project No. P.263.17.00, dated September 21, 2005. (as referenced in Treiman, 2013; not reviewed directly for this study)

Geobase, Inc., 2006a, Memorandum-Fine Arts, Citrus College, Glendora California: unpublished consultant memo summarizing findings of the fault rupture hazard study, Project No. P.263.17.00, dated July 25, 2006. (as referenced in Treiman, 2013; not reviewed directly for this study)

Geobase, Inc., 2006b, Results of Fault Rupture Hazard Study, Proposed Fine Arts Complex, 1000 West Foothill Boulevard, Citrus Community College, Glendora, California: unpublished consultant report, Project No. P.263.17.00, dated October 12, 2006. (as referenced in Treiman, 2013; not reviewed directly for this study)

Geobase, Inc., 2007, Engineering Geologic Report, Fault Rupture Hazard Study, Revised Site Plan, Proposed Fine Arts Center, 1000 West Foothill Boulevard, Citrus Community College, Glendora, California: unpublished consultant report, Project No. P.263.17.01, dated January 30, 2007. (as referenced in Treiman, 2013; not reviewed directly for this study)

Gonzalez, T., 1993, Use of soil lamellae as stratigraphic markers in fault investigations in the Los Angeles and Ventura Basins: Association of Engineering Geologists 36th Annual Meeting, Program and Abstracts, 9-16 October 1993, San Antonio, Texas, p. 50.

Group Delta (GDC), 2015, Fault Activity Investigation, East and West Millennium Sites, 1733-1741 Argyle Avenue; 6236 and 6334 W. Yucca Street; 1720-1730, 1740, 1745-1760, and 1762-1770 N. Vine Street; 1746, 1748-1754, 1760, and 1764 and 1770 N. Ivar Avenue, Hollywood Area, City of Los Angeles, California: GDC Project No. LA-1191 A, dated March 6, 2015.

Harden, J.W., 1982, A quantitative index of soil development from field descriptions: Examples from a chronosequence in central California: *Geoderma*, Vol. 28, pp. 1-28.

Harden, J.W., and Taylor, E.M., 1983, A quantitative comparison of soil development in four climatic regimes: *Quaternary Research,* Vol. 28, pp. 342-359.

Harrison, J. B. J., McFadden, L. B., Weldon, R. J., 1990, Spatial Soil Variability in the Cajon Pass Chronosequence; Implications for the use of soils as a geochronological tool: *Geomorphology*, Vol. 3, pp. 399-416.

Jenny, H., 1941, Factors of Soil Formation: MacGraw-Hill, New York, 281p.

Jerry Kovacs and Associates, Inc., 1997, Fault rupture hazard study, proposed reconstruction of Royal Oaks Manor, 1763 Royal Oaks Drive North, Duarte, California for Southern California Presbyterian Homes: unpublished consultant report, File No. 16158-S, dated November 10, 1997. (as referenced in Treiman, 2013; not reviewed directly for this study)

LeRoy Crandall and Associates, 1989, Fault Rupture Hazard Study, Proposed Skilled Nursing/Personal Care Facility, Royal Oaks Manor, 1763 Royal Oaks Drive, Duarte, Los Angeles County, California for Southern California Presbyterian Homes: unpublished consultant report, Project No. E-88471, dated January 12, 1989. (as referenced in Treiman, 2013; not reviewed directly for this study)

Lutter, W.J., Fuis, G.S., Thurber, C.H., and Murphy, J., 1999, Tomographic images of the upper crust from the Los Angeles basin to the Mojave Desert, California: Results from the Los Angeles Region Seismic Experiment: *Journal of Geophysical Research*, Vol. 104, No. B11, pp. 25,543-25,565, November 10, 1999.

McFadden, L.D., 1982, The impacts of temporal and spatial climatic changes on alluvial soil genesis in southern California: Ph.D. Dissertation, University of Arizona, 430p.

McFadden, L.D., and Weldon, R. III, 1987, Rates and processes of soil development on Quaternary terraces in Cajon Pass, California: *Geological Society of America Bulletin*, Vol. 98, pp. 280-293.

Morton, D.M., and Miller, F.K., 2006, Geologic map of the San Bernardino and Santa Ana 30′ x 60′ quadrangles, California: U.S. Geological Survey Open-File Report 2006-1217 (online version 1.0), 194p., plus plates.

Munsell Color Charts, 2000, GretagMacbeth, 617 Little Britain Rd, New Windsor, NY 12553.

M&T Agra, Inc., 1993, Additional Geologic Exploration of Possible Duarte Fault, Citrus College Performing Arts Center, Citrus College, Glendora, California: unpublished consultant report, Job No. 193-006, dated April 26, 1993. (as referenced in Treiman, 2013; not reviewed directly for this study)

M&T Agra, Inc., 1994a, Foundation Study, Proposed East and West Additions to the Haugh Performing Arts Center, Citrus Community College, Glendora, California: unpublished consulting report Job No. 193-006, dated 12/20/93 and revised 1/13/94. (as referenced in Treiman, 2013; not reviewed directly for this study)

M&T Agra, Inc., 1994b, Geologic-Seismic Review, Proposed East and West Additions, Haugh Performing Arts Center, Citrus Community College, Glendora, California: unpublished consulting report Job No. 193-006, dated 12/20/93 and revised 1/13/94. (as referenced in Treiman, 2013; not reviewed directly for this study)

National Soil Survey Center, 2012, Field Book for Describing and Sampling Soils: U.S. Department of Agriculture, Natural Resources Conservation Service, Version 3.0.

Ponti, D. J., 1985, The Quaternary alluvial sequence of the Antelope Valley, California: *Geological Society of America Special Paper 203*, pp. 79-96.

Rockwell, T.K., Keller, E.A. and Clark, M.N., 1984, Chronology and rates of faulting of Ventura River terraces, California: *Geological Society of America Bulletin*, Vol. 95, pp. 1466-1474.

Rockwell, T.K., Johnson, D.L., Keller, E.A. and Dembroff, G.R., l985, A late Pleistocene-Holocene soil chronosequence in the central Ventura Basin, Southern California, U.S.A; *in* Richards, K., Arnett, R. and Ellis, S., (editors), Geomorphology and Soils: George Allen and Unwin, pp. 309-327.

Rockwell, T.K., Keller, E.A. and Clark, M.N., 1984, Chronology and rates of faulting of Ventura River terraces, California: *Geological Society of America Bulletin*, Vol. 95, pp. 1466-1474.

Rockwell, T., Loughman, C., and Merifield, P., 1990, Late Quaternary rate of slip along the San Jacinto fault zone near Anza, southern California: *Journal of Geophysical Research*, Vol. 95, No. B6, pp. 8593-8605.

Shelton, J.S., 1946, Geology of northeast margin of San Gabriel basin, Los Angeles County, California: U.S. Geological Survey, Oil and Gas Investigations, Preliminary Map 63, 1:24,000.

Soil Survey Staff, 1975, Soil Taxonomy: US Department of Agriculture Handbook #436: US Government Printing Office, Washington, DC.

Soil Survey Staff, 1992, Keys to Soil Taxonomy: SMSS Technical Monograph #19: Pocahontas Press, Inc., Blacksberg, Virginia, 5th edition, 556p.

McFadden, L.D., Tinsley, J.C., and Bull, W.B., 1982, Late Quaternary Pedogenesis and Alluvial Chronologies of the Los Angeles Basin and San Gabriel Mountains Areas, Southern California; in Tinsley, J.C., Matti, J.C. and McFadden, L.D., 1982, (editors), Late Quaternary Pedogenesis and Alluvial Chronologies of the Los Angeles and San Gabriel Mountains Area, Southern California and Holocene Faulting and Alluvial Stratigraphy within the Cucamonga Fault Zone: A Preliminary Review: Guidebook, 78th Annual Meeting of the Cordilleran Section of the Geological Society of America, Anaheim, California, April 19-21, 1982, pp 1-13.

Torrent, J., Nettleton, W.D., and Borst, G., 1980, Clay illuviation and lamella formation in a Psammentic Haploxeralf in Southern California: *Soil Science Society of America Journal*, Vol. 44, pp. 363-369.

Treiman, J.A., 2013, The Sierra Madre Fault Zone in the Azusa Quadrangle, Los Angeles County, California: California Geological Survey Fault Evaluation Report FER-249, 32p., + plates, dated December 20, 2013.

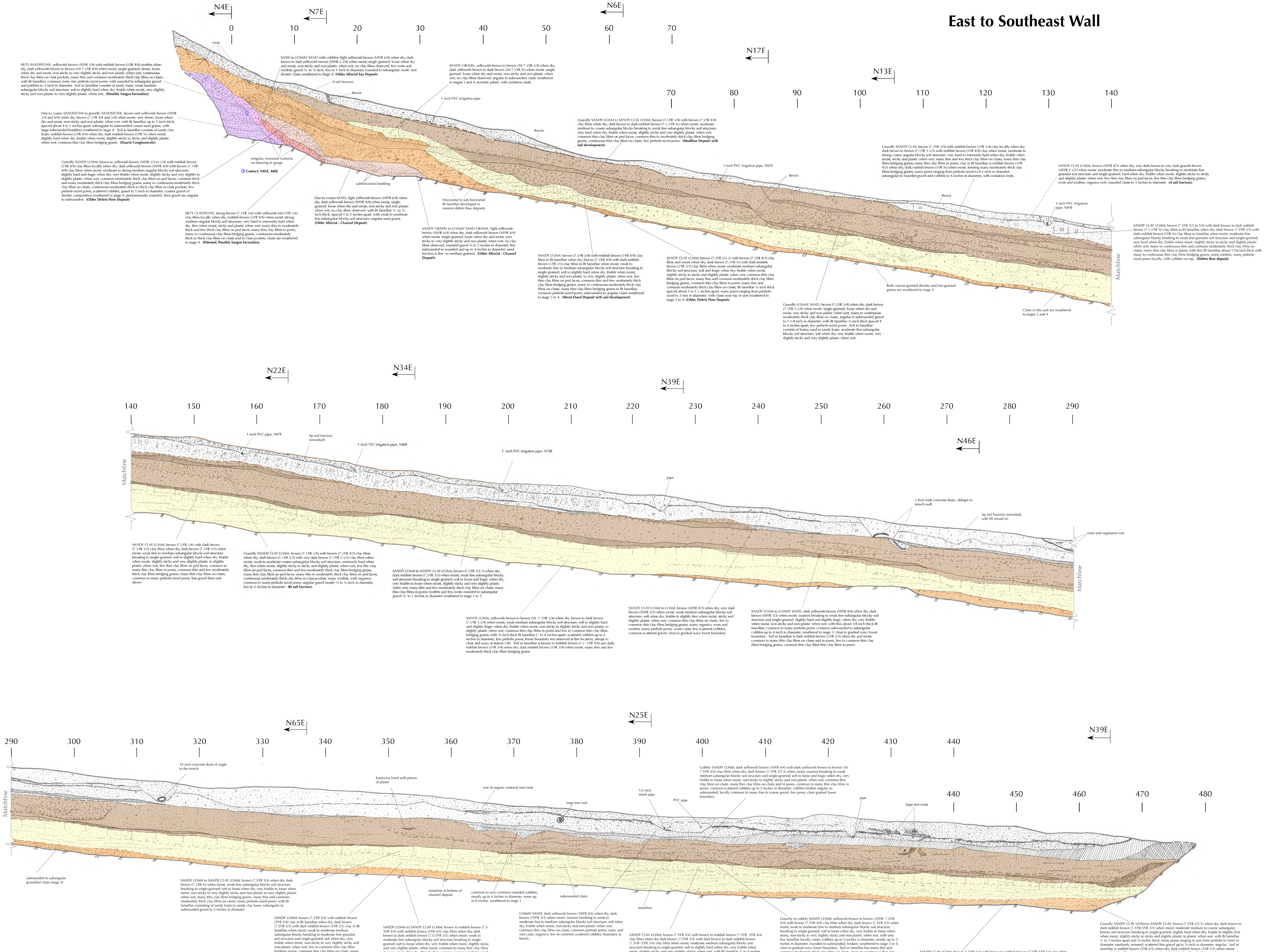
Treiman, J.A., 2014, The Sierra Madre Fault Zone in the Azusa Quadrangle, Los Angeles County, California: California Geological Survey Fault Evaluation Report FER-249 Supplement No. 1, 30p., + plates, dated December 20, 2013.

Tucker, A.Z., and Dolan, J.F., 2001, Paleoseismological evidence for a >8 Ka age of the most recent surface rupture on the eastern Sierra Madre fault, northern Los Angeles metropolitan region, California: *Bulletin of the Seismological Society of America*, Vol. 91, pp. 232-249.

Walls, C., Rockwell, T., Mueller, K., Bock, Y., Williams, S., Pfanner, J., and Fang, P., 1998, Escape Tectonics in the Los Angeles Metropolitan Region and Implications for Seismic Risk: *Nature*, Vol. 394, pp. 356-360.

Yeats, R.S., 2004, Tectonics of the San Gabriel Basin and surroundings, southern California: *Geological Society of America Bulletin*, Vol. 116, No. 9/10, pp. 1158-1182.

East to Southeast Wall



Symbols

Clay	Sharp contact	Clay-enriched lamellae
Silt	Approximate contact	Grussified clast
Sand	Uncertain contact	Soil development
Gravel and Pebbles	Gradational contact, typically for soils	Pipe
Cobbles	Trench bench	Animal burrow (krotovina)

Scale

0 5 10

1 inch = 5 feet

no vertical exaggeration

Log of Trench T-1a

1901 Royal Oaks Drive, Bradbury, California

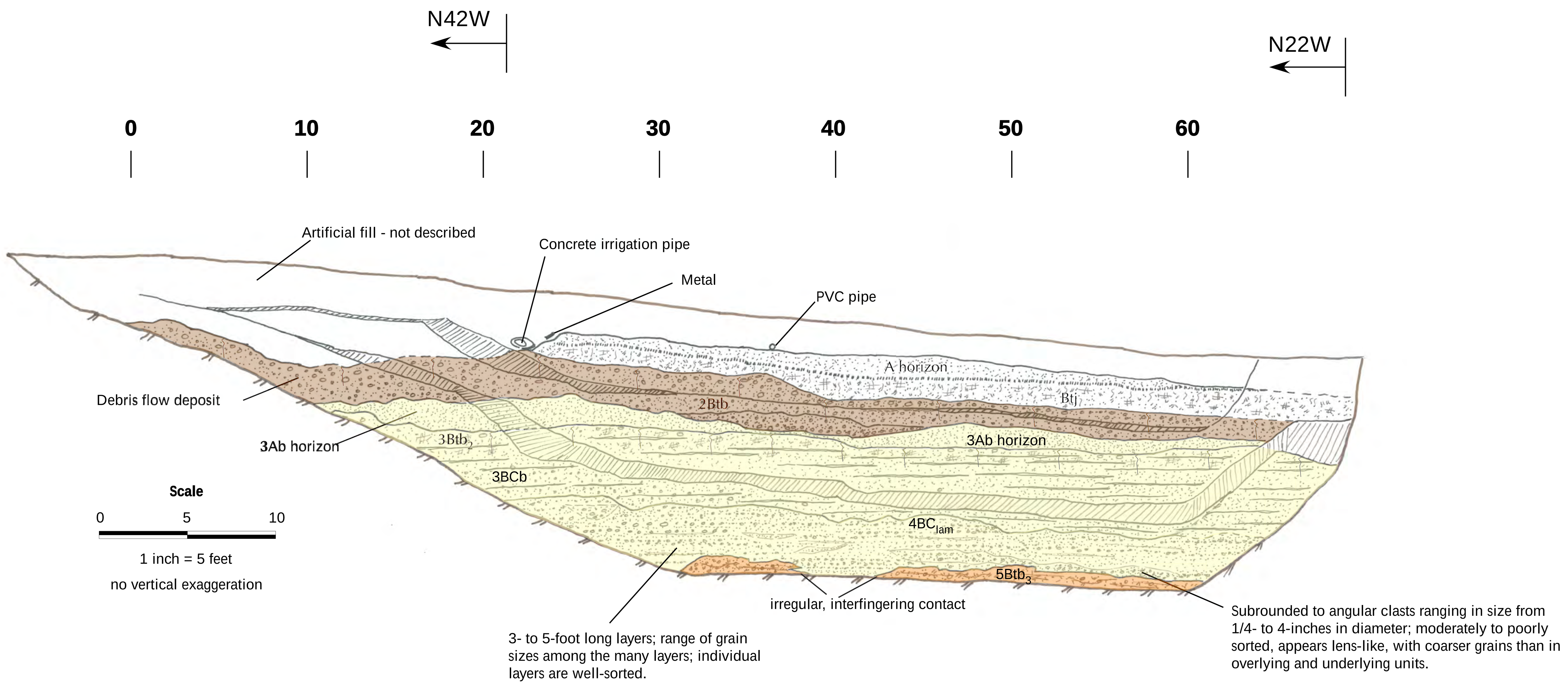
Earth Consultants International

Project Number: 3509
Date: 2015

Plate 1

Trench 1b

Northeast Wall



Photomosaic of Northeast Wall

ECI File No. 3509_Yihe_RoyalOaks
Mosaic created by MWP on 8/21/2015

Soil Descriptions

A horizon: SANDY LOAM to LOAM; brown to yellowish brown (10-7.5YR 5/4) when dry, dark brown (7.5YR 3/2) when moist; moderate medium subangular blocky breaking to moderate fine to medium granular soil structure; hard to soft when dry, friable to slightly firm when moist, non-sticky to slightly sticky and non-plastic to very slightly plastic when wet; common thin clay films bridging grains; bioturbated, with organics; common to many pinhole-sized pores; rootlets, few large root casts to 5mm in diameter; abrupt wavy lower boundary.

Btj horizon: SANDY LOAM; brown (7.5YR 4/2.5) when dry, dark brown (7.5YR 3/2) when moist; weak to moderate fine subangular blocky soil structure; slightly hard and fragic when dry, friable when moist, non-sticky to slightly sticky and non-plastic to very slightly plastic when wet; many to continuous thin clay films on clasts, common thin clay films on ped faces, many moderately thick clay films in pores, many thin and common moderately thick clay films bridging grains; bioturbated, many roots and rootlets; many fine pores; angular to subangular gravel to ¾-inch in diameter; clear wavy lower boundary defined by a stoneline.

2Btb horizon: LOAMY SAND to SANDY LOAM; brown (7.5YR 5/4) with reddish brown (5YR 4/3) clay films when dry, dark brown (7.5YR 3/3) with very dark brown (7.5YR 2.5/3) clay films when moist; moderate to strong coarse subangular block soil structure; slightly hard when dry, friable when moist, non-sticky to slightly sticky and non-plastic when wet; common thin clay films on clasts, many thin clay films bridging grains, few thin clay films on ped faces, common to many thin clay films in pores; common to many pores ranging from pinhole-sized up to 4 mm in diameter; rootlets; subangular to angular gravel to 2-inches in diameter, and large rounded to subangular cobbles up to 6-inches in diameter weathered to stages 3-4.

3Ab horizon: SANDY LOAM; brown (7.5YR 5/4 and 4/3) when dry, very dark brown (7.5YR 2.5/3) when moist; weak fine subangular blocky breaking to moderate fine granular soil structure; soft when dry, friable when moist, non-sticky to slightly sticky and non-plastic when wet; many thin and few moderately thick clay films bridging grains, common thin clay films on ped faces, common thin clay films in pores, many to continuous thin clay films coating clasts; common pores ranging from pinhole-sized to 3mm in diameter, randomly oriented; angular to rounded fine gravel; abrupt to clear and wavy lower boundary.

$3Btb_2$ horizon: SANDY CLAY to CLAY; brown (7.5YR 4.5/4) when dry, dark brown to dark reddish brown (7.5-5YR ¾) when moist; moderate medium subangular blocky soil structure; very hard to extremely hard when dry, slightly firm when moist, sticky to very sticky and plastic when wet; common moderately thick clay films on ped faces, continuous thin and common moderately thick clay films bridging grains, many thin clay films in pores, many thin clay films coating clasts; angular to subangular coarse sand and fine gravel to ½-inch in diameter; fining-upward; many pores ranging from pinhole-sized to 3mm in diameter, randomly oriented.

3BCb horizon: SANDY CLAY LOAM to SANDY CLAY; brown to dark brown (7.5YR 3.5/4) with few reddish brown (5YR 4/3) clay films when dry, dark brown to dark reddish brown (7.5-5YR 3/3) when moist; weak fine to medium subangular blocky structure; very hard to extremely hard when dry, firm when moist, sticky and slightly plastic to plastic when wet; many thin and few moderately thick to thick clay films on ped faces, many thin clay films in pores, common thick and many thin clay films bridging grains; common to many small pores; angular coarse sand and fine gravel to 1-inch in diameter; abrupt wavy lower boundary.

$4C_{lam}$ horizon: Fine to coarse SAND with GRAVEL beds and lenses; light yellowish brown to light brown (10-7.5YR 6/4) with yellowish red stains on clasts when dry, brown (7.5YR 4/4) when moist; single-grained; loose when dry and moist, non-sticky and non-plastic when wet; few Bt lamellae; few to common thin clay films on clasts; angular to rounded clasts; abrupt wavy to irregular lower boundary (Fluvial deposit).

$5Btb_3$ horizon: SANDY CLAY LOAM; brown to yellowish brown (10-7.5YR 5/4) when dry, brown (7.5YR 4/4) when moist; moderate medium angular blocky soil structure; hard and fragic when dry, friable when firm, sticky and slightly plastic when wet; with Bt lamellae that are dark reddish brown (5YR 3.5/4) when dry, dark reddish brown (5YR ¾) when moist; common moderately thick clay films on ped faces, many thin to moderately thick clay films bridging grains, common to many moderately thick clay films in pores, many thin clay films coating clasts, continuous moderately thick clay films bridging grains in Bt lamellae; angular coarse sand and gravel, mafic and dioritic clasts are weathered to stage 3; few roots; pinhole-sized pores; lower boundary not observed.

Symbols

Clay	Sharp contact	Clay-enriched lamellae
Silt	Approximate contact	Grussified clast
Sand	Uncertain contact	Soil development
Gravel and Pebbles	Gradational contact, typically for soils	Pipe
Cobbles	Trench bench	Animal burrow (krotovina)

Log of Trench T-1b

1901 Royal Oaks Drive, Bradbury, California

Earth Consultants International

Project Number: 3509
Date: 2015

Plate 2

APPENDIX B: SOIL COMPACTION REPORT
by Cal Land Engineering, Inc.

Cal Land Engineering, Inc.
dba Quartech Consultants
Geotechnical, Environmental, and Civil Engineering

September 22, 2015

Yihe California PTY, LTD
682 Deodar Lane
Bradbury, California 91008

Attention: Mr. Ken He

Subject: Soil Compaction Report, Trench Study Backfill,
1901 Royal Oaks Drive, APN: 8527-021-041, Bradbury, California
QCI Project No.: 13-034-007C

Gentlemen:

This report presents results of our field density tests performed on the trench backfill at the subject site. The trench was used for the evaluation of the fault trace at the site. The fault evaluation was performed by Earth Consultants International, Inc. The site conditions, field and laboratory test results, and post-grading recommendations are presented as follows:

SITE CONDITION

This report present result of our field density tests performed on the trench backfill. The trench was backfilled with the onsite-excavated soil. Backfilling was performed from August 19 through August 28, 2015. The bottom of the trench was approximately twelve feet below the adjacent grade. The soils within the trench backfill were brought to near optimum moisture content, placed in relatively thin lifts (8-inches bulk), then compacted to project standard. The approximate limits of the trench backfill are presented in the attached plate (Figure 1).

FIELD DENSITY TEST

1. Field density test was performed using the Nuclear Gauge Method (ASTM D-6938-10) and/or Sand Cone Method (ASTM D-1556-07). The field density test results are presented in Table I. Approximate locations of the test are shown on the enclosed Site Plan (Figure 1).

2. Field density tests were performed at random locations to check compaction effort provided by the contractor. The test results exceeded minimum required relative compaction of 90 percent. The test results herein are considered representative of the compacted area.

LABORATORY TESTING

The laboratory maximum dry density and optimum moisture content for the onsite soils were determined according to laboratory standard ASTM D-1557-09. The following table presents the test result of representative soil samples collected from the subject site:

TABLE II
LABORATORY TEST RESULTS

Soil Type	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
A- Medium brown silty sand	129.5	8.5
B-Light brown silty sand	128.5	9.0
C-Brown silty sand	132.0	8.0

POST-GRADING RECOMMENDATIONS

1. All utility backfill should be brought to near optimum moisture content and then compacted to obtain a minimum relative compaction of 90 percent of the laboratory standard.

2. Soils generated from footing excavations to be used on onsite should be compacted to 90 percent minimum relative compaction, whether it is to be placed in landscape areas or within areas to be improved. This material must not alter positive drainage patterns away from the structural areas.

3. All trench excavations should conform to CAL-OSHA and local safety codes.

REGULATORY COMPLIANCE

The field compaction tests were performed in accordance to the American Society for Testing and Materials (ASTM) standard procedures. The test results would not indicate the conditions of the subsurface materials underlying the fills. The engineering performance of the underlying materials and other materials are therefore not included in this report.

Our field observation and soil tests were conducted in conformance with generally accepted professional engineering practices, and no further warranty is implied nor made. This report is subjected to review by the controlling authorities of this project.

This opportunity to be of service is appreciated. If you should have any questions, please call the undersigned.

Respectfully submitted,
CalLand Engineering, Inc. (CLE)
dba Quartech Consultants (QCI)

REGISTERED PROFESSIONAL ENGINEER
JACK C. LEE
No. 2153
Exp. 5/2017
GEOTECHNICAL
STATE OF CALIFORNIA

Jack C. Lee, GE 2153
Principal Engineer

John Thurlo
Project Engineer

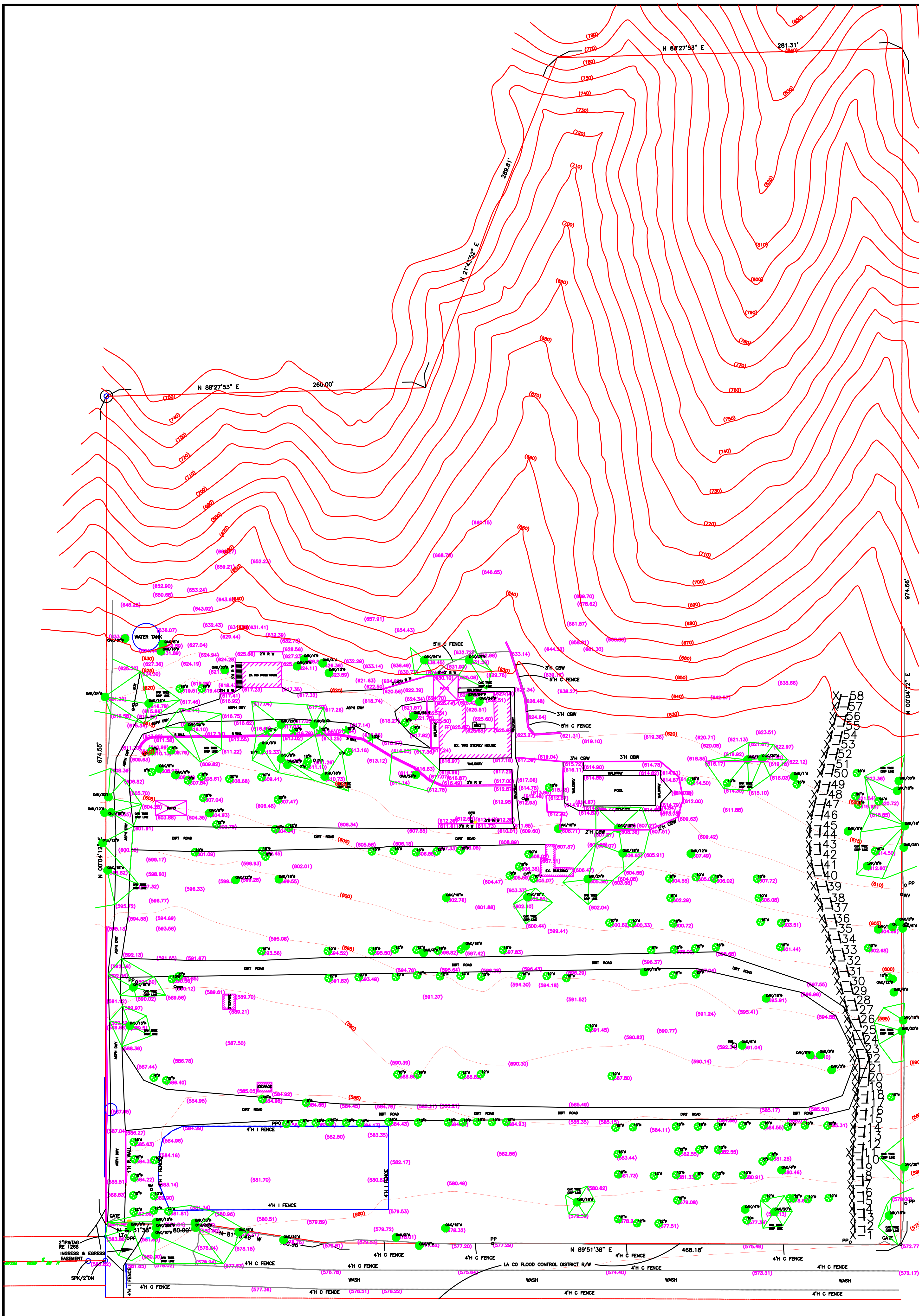
Encl.: Figure I – Site Plan
Dist: (4) Addressee

TABLE I
FIELD DENSITY TEST SUMMARY

Test NO.	Test Date	Test Location	Depth Below FS (ft)	Moisture Content (%)	Dry Density (pcf)	Relative Compaction (%)	Soil Type
X-1	8-19-15	Trench	FS	6.9	116.6	90.0	A
X-2	8-19-15	Trench	10	10.2	116.8	90.2	A
X-3	8-19-15	Trench	8	9.3	118.9	91.8	A
X-4	8-19-15	Trench	6	7.9	123.0	95.0	A
X-5	8-20-15	Trench	10	8.4	120.4	93.7	B
X-6	8-20-15	Trench	8	6.8	120.2	93.5	B
X-7	8-20-15	Trench	6	7.9	118.0	91.8	B
X-8	8-20-15	Trench	4	7.3	117.6	91.5	B
X-9	8-20-15	Trench	2	8.1	118.5	92.2	B
X-10	8-20-15	Trench	FS	8.6	121.3	94.4	B
X-11	8-20-15	Trench	10	8.2	116.2	90.4	B
X-12	8-20-15	Trench	8	8.6	119.4	92.9	B
X-13	8-20-15	Trench	6	7.9	117.3	91.3	B
X-14	8-20-15	Trench	4	7.6	116.5	90.7	B
X-15	8-20-15	Trench	2	8.4	119.0	92.6	B
X-16	8-20-15	Trench	FS	8.1	118.2	92.0	B
X-17	8-24-15	Trench	10	8.6	120.5	93.8	B
X-18	8-24-15	Trench	8	8.4	116.8	90.9	B
X-19	8-24-15	Trench	6	7.9	117.8	91.7	B
X-20	8-24-15	Trench	4	8.9	118.7	92.4	B
X-21	8-24-15	Trench	2	8.3	117.3	91.3	B
X-22	8-24-15	Trench	FS	8.7	116.9	91.0	B
X-23	8-24-15	Trench	10	6.4	120.2	93.5	B
X-24	8-24-15	Trench	8	6.9	119.6	93.1	B
X-25	8-24-15	Trench	6	7.3	118.5	92.2	B
X-26	8-24-15	Trench	4	7.0	116.7	90.8	B
X-27	8-24-15	Trench	2	6.8	117.8	91.7	B
X-28	8-24-15	Trench	FS	7.2	117.2	91.2	B
X-29	8-25-15	Trench	10	8.9	120.4	93.7	B

Test NO.	Test Date	Test Location	Depth Below FS (ft)	Moisture Content (%)	Dry Density (pcf)	Relative Compaction (%)	Soil Type
X-30	8-25-15	Trench	8	11.4	116.3	90.5	B
X-31	8-25-15	Trench	6	8.6	118.1	91.9	B
X-32	8-25-15	Trench	4	9.3	119.0	92.6	B
X-33	8-25-15	Trench	2	10.8	116.2	90.4	B
X-34	8-25-15	Trench	FS	9.5	117.1	91.1	B
X-35	8-26-15	Trench	10	9.6	118.2	92.0	B
X-36	8-26-15	Trench	8	7.3	121.2	94.3	B
X-37	8-26-15	Trench	6	6.9	119.1	92.7	B
X-38	8-26-15	Trench	4	7.4	117.3	91.3	B
X-39	8-26-15	Trench	2	8.2	116.0	90.3	B
X-40	8-26-15	Trench	FS	7.9	116.7	90.8	B
X-41	8-27-15	Trench	4	10.0	122.1	92.5	C
X-42	8-27-15	Trench	7	8.8	118.8	90.0	C
X-43	8-27-15	Trench	2	8.4	120.1	91.0	C
X-44	8-27-15	Trench	5	7.9	122.2	92.6	C
X-45	8-27-15	Trench	3	9.1	123.4	93.5	C
X-46	8-27-15	Trench	1	8.8	121.0	91.7	C
X-47	8-27-15	Trench	6	8.1	122.1	92.5	C
X-48	8-28-15	Trench	4	8.3	119.2	90.3	C
X-49	8-28-15	Trench	2	9.0	120.9	91.6	C
X-50	8-28-15	Trench	FS	10.4	119.3	90.4	C
X-51	8-28-15	Trench	6	9.7	121.2	91.8	C
X-52	8-28-15	Trench	4	10.3	118.8	90.0	C
X-53	8-28-15	Trench	2	11.0	121.3	91.9	C
X-54	8-28-15	Trench	FS	8.4	119.6	90.8	C
X-55	8-28-15	Trench	6	8.6	119.9	90.6	C
X-56	8-28-15	Trench	4	9.1	120.4	91.2	C
X-57	8-28-15	Trench	2	8.1	119.5	90.5	C
X-58	8-28-15	Trench	FS	8.0	119.1	90.2	C

Note: FS = Finish Surface



LEGEND

X-1 Approxmiate Field Density Test Location

— — — Approxmiate Limit of Compacted Fill Placed Under Purview of This Report

N

SCALE AS SHOWN

CalLand Engineering, Inc.
dba Quartech Consultants

Geotechnical, Enviromental & Civil Engineering Services

Project Address:

APN: 8527-021-041
1901 Royal Oaks Drive
Bradbury, California

SITE PLAN

9/15

FIGURE 1

Appendix D

Greenhouse Gas Data

1901 Royal Oaks

Los Angeles-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	6.00	Dwelling Unit	6.07	31,000.00	17

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2022
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Project description.

Construction Phase - Estimated schedule.

Grading - No soil import/export.

Trips and VMT - Added worker trips.

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	20.00	22.00
tblConstructionPhase	NumDays	230.00	396.00
tblConstructionPhase	NumDays	20.00	44.00
tblConstructionPhase	NumDays	20.00	22.00
tblConstructionPhase	PhaseEndDate	3/24/2022	9/8/2022
tblConstructionPhase	PhaseEndDate	1/27/2022	9/8/2022
tblConstructionPhase	PhaseEndDate	3/11/2021	3/3/2021
tblConstructionPhase	PhaseEndDate	2/24/2022	8/9/2022
tblConstructionPhase	PhaseStartDate	2/25/2022	8/10/2022
tblConstructionPhase	PhaseStartDate	3/12/2021	3/4/2021
tblConstructionPhase	PhaseStartDate	2/12/2021	1/1/2021
tblConstructionPhase	PhaseStartDate	1/28/2022	7/11/2022
tblGrading	AcresOfGrading	22.00	6.07
tblLandUse	LandUseSquareFeet	10,800.00	31,000.00
tblLandUse	LotAcreage	1.95	6.07
tblTripsAndVMT	WorkerTripNumber	2.00	10.00
tblTripsAndVMT	WorkerTripNumber	0.00	10.00

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	0.2631	2.4510	2.2037	3.7600e-003	0.1519	0.1297	0.2816	0.0775	0.1214	0.1989	0.0000	325.3122	325.3122	0.0798	0.0000	327.3059
2022	0.2691	1.5474	1.6879	2.8400e-003	0.0134	0.0797	0.0931	3.5700e-003	0.0749	0.0785	0.0000	245.5834	245.5834	0.0574	0.0000	247.0192
Maximum	**0.2691**	**2.4510**	**2.2037**	**3.7600e-003**	**0.1519**	**0.1297**	**0.2816**	**0.0775**	**0.1214**	**0.1989**	**0.0000**	**325.3122**	**325.3122**	**0.0798**	**0.0000**	**327.3059**

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	0.2631	2.4510	2.2037	3.7600e-003	0.0773	0.1297	0.2069	0.0372	0.1214	0.1587	0.0000	325.3119	325.3119	0.0798	0.0000	327.3056
2022	0.2691	1.5474	1.6879	2.8400e-003	0.0134	0.0797	0.0931	3.5700e-003	0.0749	0.0785	0.0000	245.5831	245.5831	0.0574	0.0000	247.0189
Maximum	**0.2691**	**2.4510**	**2.2037**	**3.7600e-003**	**0.0773**	**0.1297**	**0.2069**	**0.0372**	**0.1214**	**0.1587**	**0.0000**	**325.3119**	**325.3119**	**0.0798**	**0.0000**	**327.3056**

	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**	**45.16**	**0.00**	**19.92**	**49.65**	**0.00**	**14.51**	**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	1-1-2021	3-31-2021	0.7963	0.7963
2	4-1-2021	6-30-2021	0.6339	0.6339
3	7-1-2021	9-30-2021	0.6409	0.6409
4	10-1-2021	12-31-2021	0.6412	0.6412
5	1-1-2022	3-31-2022	0.5622	0.5622
6	4-1-2022	6-30-2022	0.5682	0.5682
7	7-1-2022	9-30-2022	0.6816	0.6816
		Highest	0.7963	0.7963

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	0.1432	2.2700e-003	0.1001	1.0000e-004		6.0700e-003	6.0700e-003		6.0700e-003	6.0700e-003	0.6373	1.3258	1.9631	2.0000e-003	4.0000e-005	2.0259
Energy	8.9000e-004	7.6000e-003	3.2300e-003	5.0000e-005		6.1000e-004	6.1000e-004		6.1000e-004	6.1000e-004	0.0000	24.4889	24.4889	8.2000e-004	3.0000e-004	24.5973
Mobile	0.0177	0.0930	0.2436	8.9000e-004	0.0735	7.4000e-004	0.0743	0.0197	6.9000e-004	0.0204	0.0000	82.1413	82.1413	4.2200e-003	0.0000	82.2469
Waste						0.0000	0.0000		0.0000	0.0000	1.4149	0.0000	1.4149	0.0836	0.0000	3.5052
Water						0.0000	0.0000		0.0000	0.0000	0.1240	2.4943	2.6183	0.0128	3.2000e-004	3.0353
Total	**0.1618**	**0.1028**	**0.3469**	**1.0400e-003**	**0.0735**	**7.4200e-003**	**0.0809**	**0.0197**	**7.3700e-003**	**0.0271**	**2.1762**	**110.4503**	**112.6265**	**0.1035**	**6.6000e-004**	**115.4107**

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	0.1432	2.2700e-003	0.1001	1.0000e-004		6.0700e-003	6.0700e-003		6.0700e-003	6.0700e-003	0.6373	1.3258	1.9631	2.0000e-003	4.0000e-005	2.0259
Energy	8.9000e-004	7.6000e-003	3.2300e-003	5.0000e-005		6.1000e-004	6.1000e-004		6.1000e-004	6.1000e-004	0.0000	24.4889	24.4889	8.2000e-004	3.0000e-004	24.5973
Mobile	0.0177	0.0930	0.2436	8.9000e-004	0.0735	7.4000e-004	0.0743	0.0197	6.9000e-004	0.0204	0.0000	82.1413	82.1413	4.2200e-003	0.0000	82.2469
Waste						0.0000	0.0000		0.0000	0.0000	1.4149	0.0000	1.4149	0.0836	0.0000	3.5052
Water						0.0000	0.0000		0.0000	0.0000	0.1240	2.4943	2.6183	0.0128	3.2000e-004	3.0353
Total	**0.1618**	**0.1028**	**0.3469**	**1.0400e-003**	**0.0735**	**7.4200e-003**	**0.0809**	**0.0197**	**7.3700e-003**	**0.0271**	**2.1762**	**110.4503**	**112.6265**	**0.1035**	**6.6000e-004**	**115.4107**

	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	Grading	Grading	1/1/2021	3/3/2021	5	44	
2	Building Construction	Building Construction	3/4/2021	9/8/2022	5	396	
3	Paving	Paving	7/11/2022	8/9/2022	5	22	
4	Architectural Coating	Architectural Coating	8/10/2022	9/8/2022	5	22	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 6.07

Acres of Paving: 0

Residential Indoor: 62,775; Residential Outdoor: 20,925; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Grading	Excavators	1	8.00	158	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	130	0.42
Paving	Rollers	2	8.00	80	0.38
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Paving	Paving Equipment	2	8.00	132	0.36
Building Construction	Welders	1	8.00	46	0.45

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
Grading	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	10.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	10.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 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					0.1357	0.0000	0.1357	0.0732	0.0000	0.0732	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0504	0.5442	0.3489	6.5000e-004		0.0255	0.0255		0.0235	0.0235	0.0000	57.3181	57.3181	0.0185	0.0000	57.7816
Total	**0.0504**	**0.5442**	**0.3489**	**6.5000e-004**	**0.1357**	**0.0255**	**0.1612**	**0.0732**	**0.0235**	**0.0967**	**0.0000**	**57.3181**	**57.3181**	**0.0185**	**0.0000**	**57.7816**

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	1.4200e-003	1.1100e-003	0.0125	4.0000e-005	3.6200e-003	3.0000e-005	3.6500e-003	9.6000e-004	3.0000e-005	9.9000e-004	0.0000	3.2634	3.2634	1.0000e-004	0.0000	3.2658
Total	**1.4200e-003**	**1.1100e-003**	**0.0125**	**4.0000e-005**	**3.6200e-003**	**3.0000e-005**	**3.6500e-003**	**9.6000e-004**	**3.0000e-005**	**9.9000e-004**	**0.0000**	**3.2634**	**3.2634**	**1.0000e-004**	**0.0000**	**3.2658**

3.2 Grading - 2021

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					0.0611	0.0000	0.0611	0.0329	0.0000	0.0329	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0504	0.5442	0.3489	6.5000e-004		0.0255	0.0255		0.0235	0.0235	0.0000	57.3181	57.3181	0.0185	0.0000	57.7815
Total	**0.0504**	**0.5442**	**0.3489**	**6.5000e-004**	**0.0611**	**0.0255**	**0.0866**	**0.0329**	**0.0235**	**0.0564**	**0.0000**	**57.3181**	**57.3181**	**0.0185**	**0.0000**	**57.7815**

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	1.4200e-003	1.1100e-003	0.0125	4.0000e-005	3.6200e-003	3.0000e-005	3.6500e-003	9.6000e-004	3.0000e-005	9.9000e-004	0.0000	3.2634	3.2634	1.0000e-004	0.0000	3.2658
Total	**1.4200e-003**	**1.1100e-003**	**0.0125**	**4.0000e-005**	**3.6200e-003**	**3.0000e-005**	**3.6500e-003**	**9.6000e-004**	**3.0000e-005**	**9.9000e-004**	**0.0000**	**3.2634**	**3.2634**	**1.0000e-004**	**0.0000**	**3.2658**

3.3 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	0.2063	1.8914	1.7984	2.9200e-003		0.1040	0.1040		0.0978	0.0978	0.0000	251.3265	251.3265	0.0606	0.0000	252.8423
Total	**0.2063**	**1.8914**	**1.7984**	**2.9200e-003**		**0.1040**	**0.1040**		**0.0978**	**0.0978**	**0.0000**	**251.3265**	**251.3265**	**0.0606**	**0.0000**	**252.8423**

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	3.4000e-004	0.0107	2.9000e-003	3.0000e-005	6.8000e-004	2.0000e-005	7.1000e-004	2.0000e-004	2.0000e-005	2.2000e-004	0.0000	2.6745	2.6745	1.6000e-004	0.0000	2.6786
Worker	4.6700e-003	3.6300e-003	0.0410	1.2000e-004	0.0119	1.0000e-004	0.0120	3.1600e-003	9.0000e-005	3.2500e-003	0.0000	10.7298	10.7298	3.2000e-004	0.0000	10.7376
Total	**5.0100e-003**	**0.0143**	**0.0439**	**1.5000e-004**	**0.0126**	**1.2000e-004**	**0.0127**	**3.3600e-003**	**1.1000e-004**	**3.4700e-003**	**0.0000**	**13.4042**	**13.4042**	**4.8000e-004**	**0.0000**	**13.4162**

3.3 Building Construction - 2021

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	0.2063	1.8914	1.7984	2.9200e-003		0.1040	0.1040		0.0978	0.0978	0.0000	251.3262	251.3262	0.0606	0.0000	252.8420
Total	**0.2063**	**1.8914**	**1.7984**	**2.9200e-003**		**0.1040**	**0.1040**		**0.0978**	**0.0978**	**0.0000**	**251.3262**	**251.3262**	**0.0606**	**0.0000**	**252.8420**

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	3.4000e-004	0.0107	2.9000e-003	3.0000e-005	6.8000e-004	2.0000e-005	7.1000e-004	2.0000e-004	2.0000e-005	2.2000e-004	0.0000	2.6745	2.6745	1.6000e-004	0.0000	2.6786
Worker	4.6700e-003	3.6300e-003	0.0410	1.2000e-004	0.0119	1.0000e-004	0.0120	3.1600e-003	9.0000e-005	3.2500e-003	0.0000	10.7298	10.7298	3.2000e-004	0.0000	10.7376
Total	**5.0100e-003**	**0.0143**	**0.0439**	**1.5000e-004**	**0.0126**	**1.2000e-004**	**0.0127**	**3.3600e-003**	**1.1000e-004**	**3.4700e-003**	**0.0000**	**13.4042**	**13.4042**	**4.8000e-004**	**0.0000**	**13.4162**

3.3 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	0.1527	1.3976	1.4645	2.4100e-003		0.0724	0.0724		0.0681	0.0681	0.0000	207.3941	207.3941	0.0497	0.0000	208.6362
Total	**0.1527**	**1.3976**	**1.4645**	**2.4100e-003**		**0.0724**	**0.0724**		**0.0681**	**0.0681**	**0.0000**	**207.3941**	**207.3941**	**0.0497**	**0.0000**	**208.6362**

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	2.6000e-004	8.3900e-003	2.2700e-003	2.0000e-005	5.6000e-004	2.0000e-005	5.8000e-004	1.6000e-004	2.0000e-005	1.8000e-004	0.0000	2.1868	2.1868	1.3000e-004	0.0000	2.1900
Worker	3.6100e-003	2.7100e-003	0.0312	9.0000e-005	9.8100e-003	8.0000e-005	9.8900e-003	2.6000e-003	7.0000e-005	2.6800e-003	0.0000	8.5397	8.5397	2.4000e-004	0.0000	8.5456
Total	**3.8700e-003**	**0.0111**	**0.0335**	**1.1000e-004**	**0.0104**	**1.0000e-004**	**0.0105**	**2.7600e-003**	**9.0000e-005**	**2.8600e-003**	**0.0000**	**10.7265**	**10.7265**	**3.7000e-004**	**0.0000**	**10.7356**

3.3 Building Construction - 2022

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	0.1527	1.3976	1.4645	2.4100e-003		0.0724	0.0724		0.0681	0.0681	0.0000	207.3939	207.3939	0.0497	0.0000	208.6360
Total	**0.1527**	**1.3976**	**1.4645**	**2.4100e-003**		**0.0724**	**0.0724**		**0.0681**	**0.0681**	**0.0000**	**207.3939**	**207.3939**	**0.0497**	**0.0000**	**208.6360**

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	2.6000e-004	8.3900e-003	2.2700e-003	2.0000e-005	5.6000e-004	2.0000e-005	5.8000e-004	1.6000e-004	2.0000e-005	1.8000e-004	0.0000	2.1868	2.1868	1.3000e-004	0.0000	2.1900
Worker	3.6100e-003	2.7100e-003	0.0312	9.0000e-005	9.8100e-003	8.0000e-005	9.8900e-003	2.6000e-003	7.0000e-005	2.6800e-003	0.0000	8.5397	8.5397	2.4000e-004	0.0000	8.5456
Total	**3.8700e-003**	**0.0111**	**0.0335**	**1.1000e-004**	**0.0104**	**1.0000e-004**	**0.0105**	**2.7600e-003**	**9.0000e-005**	**2.8600e-003**	**0.0000**	**10.7265**	**10.7265**	**3.7000e-004**	**0.0000**	**10.7356**

3.4 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	0.0121	0.1224	0.1604	2.5000e-004		6.2500e-003	6.2500e-003		5.7500e-003	5.7500e-003	0.0000	22.0303	22.0303	7.1300e-003	0.0000	22.2084
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0121**	**0.1224**	**0.1604**	**2.5000e-004**		**6.2500e-003**	**6.2500e-003**		**5.7500e-003**	**5.7500e-003**	**0.0000**	**22.0303**	**22.0303**	**7.1300e-003**	**0.0000**	**22.2084**

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	6.7000e-004	5.0000e-004	5.7500e-003	2.0000e-005	1.8100e-003	1.0000e-005	1.8200e-003	4.8000e-004	1.0000e-005	4.9000e-004	0.0000	1.5744	1.5744	4.0000e-005	0.0000	1.5754
Total	**6.7000e-004**	**5.0000e-004**	**5.7500e-003**	**2.0000e-005**	**1.8100e-003**	**1.0000e-005**	**1.8200e-003**	**4.8000e-004**	**1.0000e-005**	**4.9000e-004**	**0.0000**	**1.5744**	**1.5744**	**4.0000e-005**	**0.0000**	**1.5754**

3.4 Paving - 2022

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	0.0121	0.1224	0.1604	2.5000e-004		6.2500e-003	6.2500e-003		5.7500e-003	5.7500e-003	0.0000	22.0303	22.0303	7.1300e-003	0.0000	22.2084
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0121**	**0.1224**	**0.1604**	**2.5000e-004**		**6.2500e-003**	**6.2500e-003**		**5.7500e-003**	**5.7500e-003**	**0.0000**	**22.0303**	**22.0303**	**7.1300e-003**	**0.0000**	**22.2084**

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	6.7000e-004	5.0000e-004	5.7500e-003	2.0000e-005	1.8100e-003	1.0000e-005	1.8200e-003	4.8000e-004	1.0000e-005	4.9000e-004	0.0000	1.5744	1.5744	4.0000e-005	0.0000	1.5754
Total	**6.7000e-004**	**5.0000e-004**	**5.7500e-003**	**2.0000e-005**	**1.8100e-003**	**1.0000e-005**	**1.8200e-003**	**4.8000e-004**	**1.0000e-005**	**4.9000e-004**	**0.0000**	**1.5744**	**1.5744**	**4.0000e-005**	**0.0000**	**1.5754**

3.5 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	0.0970					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.2500e-003	0.0155	0.0200	3.0000e-005		9.0000e-004	9.0000e-004		9.0000e-004	9.0000e-004	0.0000	2.8086	2.8086	1.8000e-004	0.0000	2.8132
Total	**0.0992**	**0.0155**	**0.0200**	**3.0000e-005**		**9.0000e-004**	**9.0000e-004**		**9.0000e-004**	**9.0000e-004**	**0.0000**	**2.8086**	**2.8086**	**1.8000e-004**	**0.0000**	**2.8132**

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	4.4000e-004	3.3000e-004	3.8300e-003	1.0000e-005	1.2100e-003	1.0000e-005	1.2200e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	1.0496	1.0496	3.0000e-005	0.0000	1.0503
Total	**4.4000e-004**	**3.3000e-004**	**3.8300e-003**	**1.0000e-005**	**1.2100e-003**	**1.0000e-005**	**1.2200e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**	**0.0000**	**1.0496**	**1.0496**	**3.0000e-005**	**0.0000**	**1.0503**

3.5 Architectural Coating - 2022

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	0.0970					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.2500e-003	0.0155	0.0200	3.0000e-005		9.0000e-004	9.0000e-004		9.0000e-004	9.0000e-004	0.0000	2.8086	2.8086	1.8000e-004	0.0000	2.8132
Total	**0.0992**	**0.0155**	**0.0200**	**3.0000e-005**		**9.0000e-004**	**9.0000e-004**		**9.0000e-004**	**9.0000e-004**	**0.0000**	**2.8086**	**2.8086**	**1.8000e-004**	**0.0000**	**2.8132**

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	4.4000e-004	3.3000e-004	3.8300e-003	1.0000e-005	1.2100e-003	1.0000e-005	1.2200e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	1.0496	1.0496	3.0000e-005	0.0000	1.0503
Total	**4.4000e-004**	**3.3000e-004**	**3.8300e-003**	**1.0000e-005**	**1.2100e-003**	**1.0000e-005**	**1.2200e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**	**0.0000**	**1.0496**	**1.0496**	**3.0000e-005**	**0.0000**	**1.0503**

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	0.0177	0.0930	0.2436	8.9000e-004	0.0735	7.4000e-004	0.0743	0.0197	6.9000e-004	0.0204	0.0000	82.1413	82.1413	4.2200e-003	0.0000	82.2469
Unmitigated	0.0177	0.0930	0.2436	8.9000e-004	0.0735	7.4000e-004	0.0743	0.0197	6.9000e-004	0.0204	0.0000	82.1413	82.1413	4.2200e-003	0.0000	82.2469

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	57.12	59.46	51.72	193,694	193,694
Total	57.12	59.46	51.72	193,694	193,694

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
Single Family Housing	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876

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	15.6920	15.6920	6.5000e-004	1.3000e-004	15.7482
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	15.6920	15.6920	6.5000e-004	1.3000e-004	15.7482
NaturalGas Mitigated	8.9000e-004	7.6000e-003	3.2300e-003	5.0000e-005		6.1000e-004	6.1000e-004		6.1000e-004	6.1000e-004	0.0000	8.7969	8.7969	1.7000e-004	1.6000e-004	8.8492
NaturalGas Unmitigated	8.9000e-004	7.6000e-003	3.2300e-003	5.0000e-005		6.1000e-004	6.1000e-004		6.1000e-004	6.1000e-004	0.0000	8.7969	8.7969	1.7000e-004	1.6000e-004	8.8492

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					
Single Family Housing	164848	8.9000e-004	7.6000e-003	3.2300e-003	5.0000e-005		6.1000e-004	6.1000e-004		6.1000e-004	6.1000e-004	0.0000	8.7969	8.7969	1.7000e-004	1.6000e-004	8.8492
Total		**8.9000e-004**	**7.6000e-003**	**3.2300e-003**	**5.0000e-005**		**6.1000e-004**	**6.1000e-004**		**6.1000e-004**	**6.1000e-004**	**0.0000**	**8.7969**	**8.7969**	**1.7000e-004**	**1.6000e-004**	**8.8492**

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					
Single Family Housing	164848	8.9000e-004	7.6000e-003	3.2300e-003	5.0000e-005		6.1000e-004	6.1000e-004		6.1000e-004	6.1000e-004	0.0000	8.7969	8.7969	1.7000e-004	1.6000e-004	8.8492
Total		**8.9000e-004**	**7.6000e-003**	**3.2300e-003**	**5.0000e-005**		**6.1000e-004**	**6.1000e-004**		**6.1000e-004**	**6.1000e-004**	**0.0000**	**8.7969**	**8.7969**	**1.7000e-004**	**1.6000e-004**	**8.8492**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	49249.7	15.6920	6.5000e-004	1.3000e-004	15.7482
Total		**15.6920**	**6.5000e-004**	**1.3000e-004**	**15.7482**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	49249.7	15.6920	6.5000e-004	1.3000e-004	15.7482
Total		**15.6920**	**6.5000e-004**	**1.3000e-004**	**15.7482**

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	0.1432	2.2700e-003	0.1001	1.0000e-004		6.0700e-003	6.0700e-003		6.0700e-003	6.0700e-003	0.6373	1.3258	1.9631	2.0000e-003	4.0000e-005	2.0259
Unmitigated	0.1432	2.2700e-003	0.1001	1.0000e-004		6.0700e-003	6.0700e-003		6.0700e-003	6.0700e-003	0.6373	1.3258	1.9631	2.0000e-003	4.0000e-005	2.0259

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	9.7000e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1120					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0197	1.5600e-003	0.0381	1.0000e-004		5.7300e-003	5.7300e-003		5.7300e-003	5.7300e-003	0.6373	1.2247	1.8620	1.9000e-003	4.0000e-005	1.9224
Landscaping	1.8700e-003	7.1000e-004	0.0619	0.0000		3.4000e-004	3.4000e-004		3.4000e-004	3.4000e-004	0.0000	0.1011	0.1011	1.0000e-004	0.0000	0.1035
Total	**0.1432**	**2.2700e-003**	**0.1001**	**1.0000e-004**		**6.0700e-003**	**6.0700e-003**		**6.0700e-003**	**6.0700e-003**	**0.6373**	**1.3258**	**1.9631**	**2.0000e-003**	**4.0000e-005**	**2.0259**

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	9.7000e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1120					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0197	1.5600e-003	0.0381	1.0000e-004		5.7300e-003	5.7300e-003		5.7300e-003	5.7300e-003	0.6373	1.2247	1.8620	1.9000e-003	4.0000e-005	1.9224
Landscaping	1.8700e-003	7.1000e-004	0.0619	0.0000		3.4000e-004	3.4000e-004		3.4000e-004	3.4000e-004	0.0000	0.1011	0.1011	1.0000e-004	0.0000	0.1035
Total	**0.1432**	**2.2700e-003**	**0.1001**	**1.0000e-004**		**6.0700e-003**	**6.0700e-003**		**6.0700e-003**	**6.0700e-003**	**0.6373**	**1.3258**	**1.9631**	**2.0000e-003**	**4.0000e-005**	**2.0259**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	2.6183	0.0128	3.2000e-004	3.0353
Unmitigated	2.6183	0.0128	3.2000e-004	3.0353

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	0.390924 / 0.246452	2.6183	0.0128	3.2000e-004	3.0353
Total		**2.6183**	**0.0128**	**3.2000e-004**	**3.0353**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	0.390924 / 0.246452	2.6183	0.0128	3.2000e-004	3.0353
Total		**2.6183**	**0.0128**	**3.2000e-004**	**3.0353**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	1.4149	0.0836	0.0000	3.5052
Unmitigated	1.4149	0.0836	0.0000	3.5052

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	6.97	1.4149	0.0836	0.0000	3.5052
Total		**1.4149**	**0.0836**	**0.0000**	**3.5052**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	6.97	1.4149	0.0836	0.0000	3.5052
Total		**1.4149**	**0.0836**	**0.0000**	**3.5052**

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

Appendix E

Noise Monitoring Data

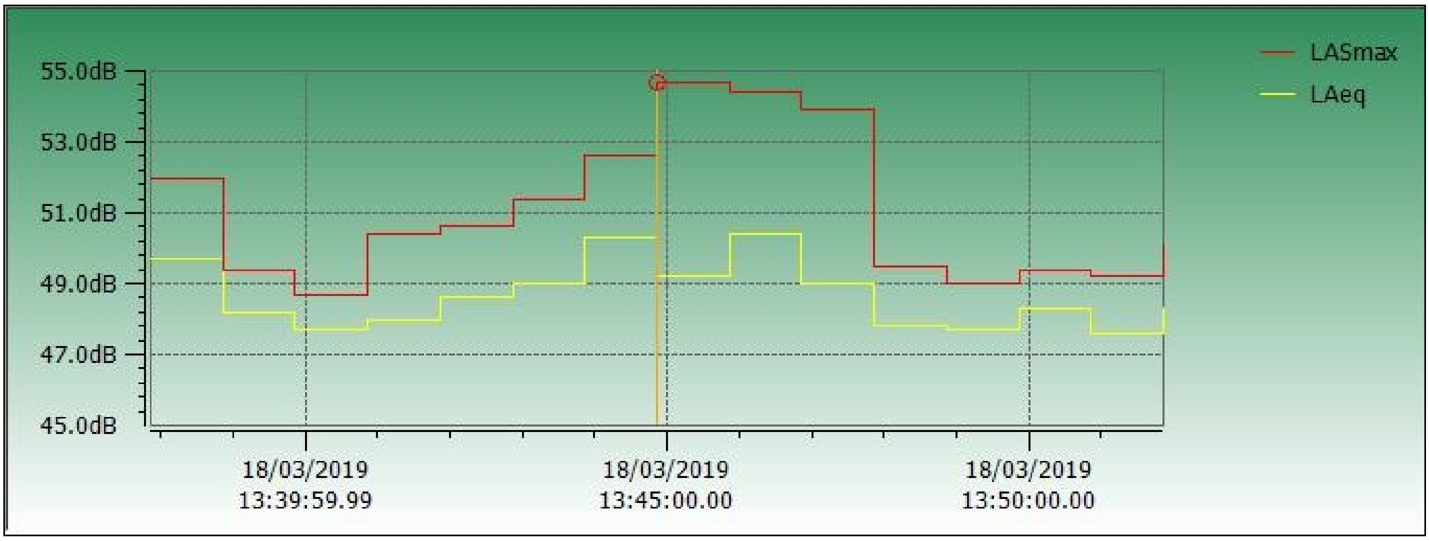
POMEROY ENVIRONMENTAL SERVICES

Noise Monitoring and
Sensitive Receptor Location Map

Report On CEL-63X

1901 Royal Oaks Dr - Location 1

Instrument Model	**CEL-633C**		
Duration	00:15:00 HH:MM:SS	LASmax	54.7 dB
End Date & Time	3/18/2019 1:52:51 PM	LASmin	46.5 dB
Run Number	12	LApeak	71.5 dB
Start Date & Time	3/18/2019 1:37:51 PM	LAeq	48.8 dB
Calibration (Before) Date	3/18/2019 1:37:19 PM	Criterion Time	00:15:00 HH:MM:SS



NOISE MONITORING FIELD REPORT

Project Name: **1901 Royal Oaks**

Monitoring Address: 1849-1901 Royal Oaks Drive

Date: 3/18/19 Site Number: 1

Measured By: Holly Galbreath

Weather Conditions: 84°, Sunny, 0% cloud

Wind Speed: 5 mph Wind Direction: From SSW

Measurement Start Time: 1:37 pm

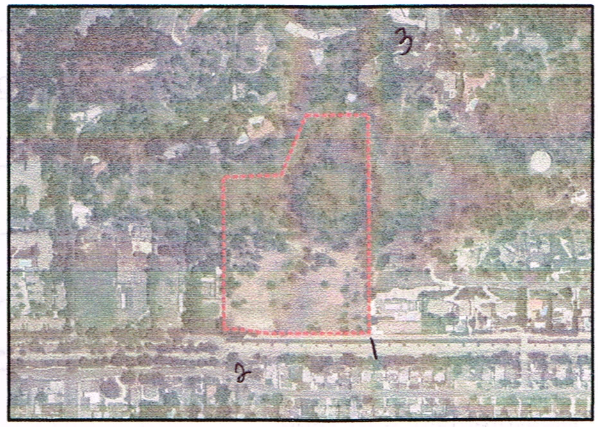
Measurement End Time: 1:52 pm Total Measurement Time: 15 min

Noise Meter Model: Casella CEL-633 Calibration: 114.0 (dBA)

Meter Setting: A-Weighted Sound Level (SLOW) Session File Name: 12

Primary Noise Sources: Pedestrian activity, traffic - Royal Oaks Dr.

Site Map



Data Summary

Noise Scale	Noise Level (dBA)
L_{eq}	48.8
L_{max}	54.7
L_{min}	46.5

Other Noise Sources During Monitoring

1. ______ Time: ______
2. ______ Time: ______
3. ______ Time: ______
4. ______ Time: ______
5. ______ Time: ______

Additional Notes:

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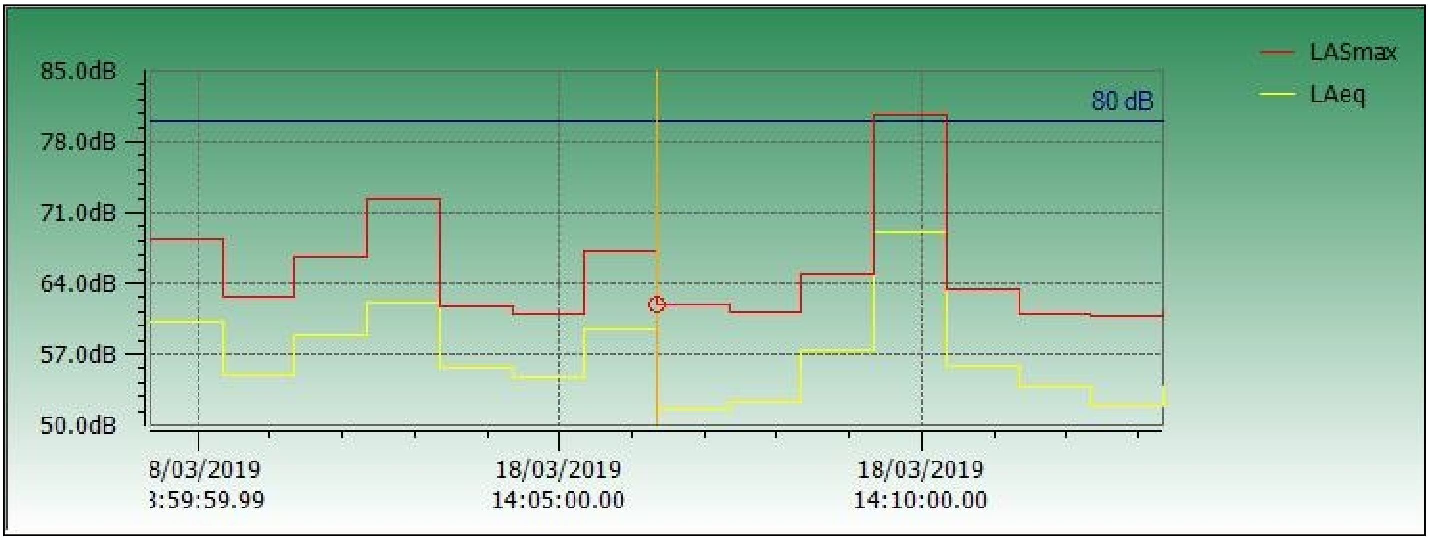
(661)-388-2422

1901 Royal Oaks Dr - Location 2

Report On CEL-63X

Instrument Model	**CEL-633C**		
Duration	00:15:00 HH:MM:SS	LASmax	80.7 dB
End Date & Time	3/18/2019 2:14:20 PM	LASmin	43.6 dB
Run Number	13	LApeak	93.4 dB
Start Date & Time	3/18/2019 1:59:20 PM	LAeq	60.1 dB
Calibration (Before) Date	3/18/2019 1:58:55 PM	Criterion Time	00:15:00 HH:MM:SS



NOISE MONITORING FIELD REPORT

Project Name: 1901 Royal Oaks

Monitoring Address: 1849-1901 Royal Oaks Drive

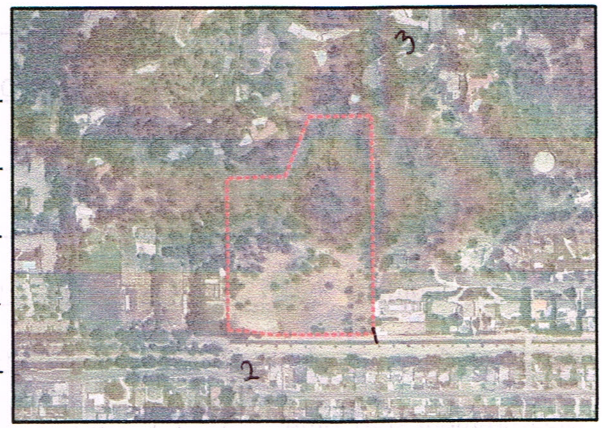
Date: 3/18/19 Site Number: 2

Measured By: Holly Galbreath

Weather Conditions: 84°, Sunny, 0% cloud

Wind Speed: 5 mph Wind Direction: From SSW

Site Map



Measurement Start Time: 1:59 pm

Measurement End Time: 2:14 pm Total Measurement Time: 15 min

Noise Meter Model: Casella CEL-633 Calibration: 114.0 (dBA)

Meter Setting: A-Weighted Sound Level (SLOW) Session File Name: 13

Primary Noise Sources: Pedestrian activity, traffic - Royal Oaks Dr.

Data Summary

Noise Scale	Noise Level (dBA)
L_{eq}	60.1
L_{max}	80.7
L_{min}	43.6

Other Noise Sources During Monitoring

1. Time:
2. Time:
3. Time:
4. Time:
5. Time:

Additional Notes:

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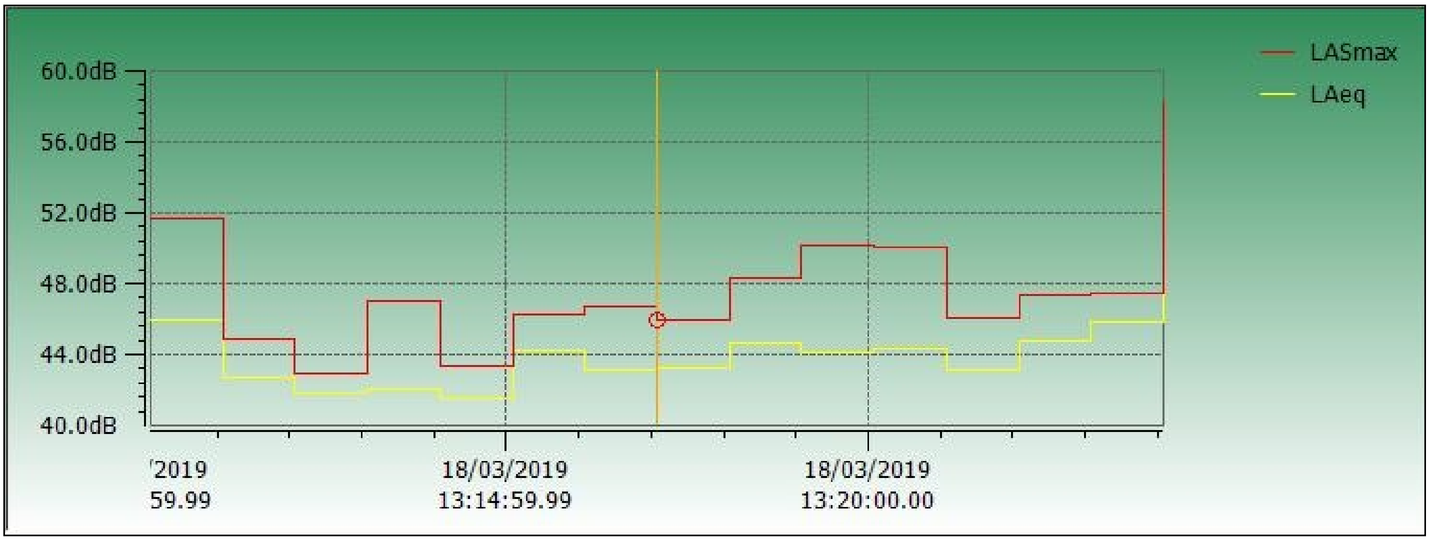
1901 Royal Oaks Dr - Location 3

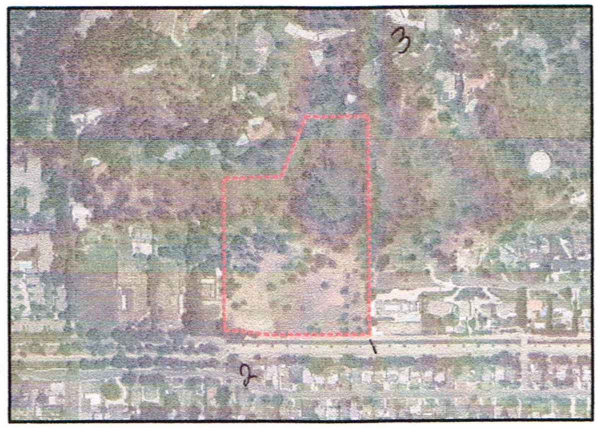
Report On CEL-63X

Instrument Model	**CEL-633C**		
Duration	00:15:00 HH:MM:SS	LASmax	58.3 dB
End Date & Time	3/18/2019 1:25:04 PM	LASmin	38.9 dB
Run Number	11	LApeak	72.4 dB
Start Date & Time	3/18/2019 1:10:04 PM	LAeq	44.4 dB
Calibration (Before) Date	3/18/2019 1:08:58 PM	Criterion Time	00:15:00 HH:MM:SS



NOISE MONITORING FIELD REPORT

Site Map



Project Name: 1901 Royal Oaks

Monitoring Address: 1849-1901 Royal Oaks Drive

Date: 3/18/19 Site Number: 3

Measured By: Holly Galbreath

Weather Conditions: 84°, Sunny, 0% cloud

Wind Speed: 5 mph Wind Direction: From SSW

Measurement Start Time: 1:10 pm

Measurement End Time: 1:25 pm Total Measurement Time: 15 min

Noise Meter Model: Casella CEL-633 Calibration: 114.0 (dBA)

Meter Setting: A-Weighted Sound Level (SLOW) Session File Name: 11

Primary Noise Sources: Residential, traffic activity

Data Summary

Noise Scale	Noise Level (dBA)
L_{eq}	44.4
L_{max}	58.3
L_{min}	38.9

Other Noise Sources During Monitoring

1. ______ Time: ______
2. ______ Time: ______
3. ______ Time: ______
4. ______ Time: ______
5. ______ Time: ______

Additional Notes:

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