City of Oakley
Planning Division

2480 Oakley Road Residential Development Project

Initial Study/Mitigated Negative Declaration

April 2020

Prepared by

RANEY PLANNING & MANAGEMENT, INC. 20 years
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Appendices

INITIAL STUDY

April 2020

A. BACKGROUND

1. Project Title: 2480 Oakley Road Residential Development Project (GPA 01-19, RZ 01-19, TM 01-19, DR 04-19)

2. Lead Agency Name and Address: City of Oakley, Planning Division, 3231 Main Street, Oakley, CA 94561

3. Contact Person and Phone Number: Ken Strelo, Principal Planner, (925) 625-7000

4. Project Location: 2480 Oakley Road, Oakley, CA 94561, APN 037-100-043-1

5. Project Sponsor's Name and Address: GKW Architects, Inc., 710 E McGlincy Lane, Suite 109, Campbell, CA 95008, (408) 315-2125

6. Existing General Plan Designation: Light Industrial (LI)

7. Proposed General Plan Designation: Single-Family Residential, High Density (SH)

8. Existing Zoning Designation: Light Industrial (LI)

9. Proposed Zoning Designation: Single-Family Residential (R-6)

10. Required Approvals from Other Public Agencies: None

11. Surrounding Land Uses and Setting:

The project site consists of approximately 4.6 acres, located at 2480 Oakley Road in the City of Oakley, California. Currently, the project site is undeveloped and consists of vacant land with ruderal vegetation and limited trees. The project site is bound by Oakley Road to the south, single-family residences to the east, single-family residences to the west, and Orchard Park Elementary School to the north. In addition, single-family residences are located to the south, across Oakley Road. The City of Oakley General Plan designates the project site as Light Industrial (LI) and the site is zoned Light Industrial (LI).

12. Project Description Summary:

    The 2480 Oakley Road Residential Development Project (proposed project) would include development of 22 single-family residences with four different floor plans ranging in size from 1,289-square feet (sf) to 2,399-sf. Primary access to the site would be provided from Oakley Road through construction of a new looped, private access roadway. The new roadway would provide internal access to the proposed residences. Additionally, the proposed project would include stormwater treatment areas, a new right-of-way dedication, and frontage improvements along Oakley Road. The project would require approval of a General Plan Amendment (GPA 01-19), Rezone (RZ 01-19), Tentative Map (TM 01-19), and Design Review (DR 04-19).

13. Status of Native American Consultation Pursuant to Public Resources Code Section 21080.3.1:

    In compliance with Assembly Bill (AB) 52 (Public Resources Code Section 21080.3.1) and Senate Bill (SB) 18, a project notification letter was distributed to the following tribes on April 2, 2019: the Amah Mutsun Tribal Band, Amah Mutsun Tribal Band of Mission San Juan Bautista, Indian Canyon Mutsun Band of Costanoan, North Valley Yokuts Tribe, The Ohline Indian Tribe, and Wilton Rancheria. One tribe requested a copy of the Phase I Literature Search and/or results of a foot survey of the project site.

B. SOURCES

The following documents are referenced information sources used for the purposes of this Initial Study:

1. Bay Area Air Quality Management District. *California Environmental Quality Act Air Quality Guidelines*. May 2017.
2. California Building Standards Commission. *California Green Building Standards Code*. 2019.
3. California Air Resources Board. *The 2017 Climate Change Scoping Plan Update.* January 20, 2017.
4. California Department of Conservation. *Contra Costa County Important Farmland Map.* 2016.
5. California Department of Finance. E-5 Population and Housing Estimates for Cities, Counties, and the State, 2011-2019, with 2010 Benchmark. Available at: http://www.dof.ca.gov/Forecasting/Demographics/Estimates/E-5/. Accessed February 2020.
6. California Department of Forestry and Fire Protection. Contra Costa *County, Fire Hazard Severity Zones in LRA*. November 7, 2009.
7. California Department of Resources Recycling and Recovery (CalRecycle). *Facility/Site Summary Details: Potrero Hill Landfill (48-AA-0075)*. Available at: https://www2.calrecycle.ca.gov/swfacilities/Directory/48-AA-0075/. Accessed February 2020.
8. Caltrans. *Transportation Related Earthborne Vibrations. TAV-02-01-R9601*. February 20, 2002.
9. City of Oakley. City of Oakley General Plan Environmental Impact Report. September 2002.
10. City of Oakley. *Oakley Municipal Code*. Updated January 14, 2020.
11. City of Oakley. *Oakley 2020 General Plan*. December 16, 2002.

12. City of Oakley. *Strategic Energy Plan*. Fall 2015.
13. City of Oakley Police Department. *2017 Annual Report*. 2017. Available at http://www.ci.oakley.ca.us/wp-content/uploads/2018/04/Annual-Report-2017-2-2.pdf. Accessed February 2020.
14. Contra Costa County Clean Water Program. *Stormwater C.3 Guidebook.* May 17, 2017.
15. Contra Costa County Flood Control District. *Contra Costa County Formed Drainage Areas.* February 7, 2008.
16. Department of Toxic Substances Control. *EnviroStor.* Available at: https://www.envirostor.dtsc.ca.gov/public/. Accessed February 2020.
17. Diablo Water District. *Final 2015 Urban Water Management Plan.* June 2016.
18. Federal Emergency Management Agency. *Flood Insurance Rate Map 06013C0355G.* Effective March 21, 2017.
19. Federal Highway Administration. *Roadway Construction Noise Model User's Guide.* January 2006.
20. Federal Transit Administration. *Transit Noise and Vibration Impact Assessment Guidelines.* May 2006.
21. Geo-Engineering Solutions, Inc. *Geotechnical Engineering Study.* August 27, 2018.
22. Gallaway Enterprises. *Planning Survey Report.* April 2019.
23. KD Anderson & Associates, Inc. *Traffic Impact Assessment for 22 Lot Subdivision Proposed at 2480 Oakley Road, Oakley, California.* April 30, 2019.
24. Tom Origer & Associates. *Cultural Resources Study of the Property at 2480 Oakley Road, Oakley, Contra Costa County, California.* February 18, 2020.

C. ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Less Than Significant with Mitigation Incorporated" or as indicated by the checklist on the following pages.

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

D. DETERMINATION

On the basis of this initial study:

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

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

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

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

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

Signature	Date
Ken Strelo, Principal Planner	City of Oakley
Printed Name	For

E. BACKGROUND AND INTRODUCTION

This Initial Study/Mitigated Negative Declaration (IS/MND) provides an environmental analysis pursuant to the California Environmental Quality Act (CEQA) for the proposed project. The applicant has submitted this application to the City of Oakley, which is the Lead Agency for the purposes of CEQA review. The IS/MND contains an analysis of the environmental effects of construction and operation of the proposed project.

In December 2002, the City of Oakley adopted the Oakley General Plan and the Oakley General Plan Environmental Impact Report (EIR). The General Plan EIR was a program-level EIR, prepared pursuant to Section 15168 of the CEQA Guidelines (Title 14, California Code of Regulations, Sections 15000 et seq.). The General Plan EIR analyzed full implementation of the Oakley General Plan and identified measures to mitigate the significant adverse project and cumulative impacts associated with the General Plan. Pursuant to CEQA Guidelines Section 15150(a), the City of Oakley General Plan and General Plan EIR are incorporated by reference. Both documents are available at the City of Oakley, 3231 Main Street, Oakley, CA 94561.

The impact discussions for each section of this IS/MND have been largely based on information in the Oakley General Plan and the Oakley General Plan EIR, as well as technical studies prepared for the proposed project.

The mitigation measures prescribed for environmental effects described in this IS/MND would be implemented in conjunction with the project, as required by CEQA, and the mitigation measures would be incorporated into the project. In addition, a project Mitigation Monitoring and Reporting Program (MMRP) would be adopted in conjunction with approval of the project.

F. PROJECT DESCRIPTION

The following section provides a comprehensive description of the proposed project in accordance with CEQA Guidelines.

Project Location and Setting

The project site consists of approximately 4.6 acres located at 2480 Oakley Road, in the City of Oakley, California (see Figure 1). The project site is bound by Oakley Road to the south, single-family residences to the east, single-family residences to the west, and Orchard Park Elementary School to the north (see Figure 2). In addition, single-family residences are located to the south, across Oakley Road. The site is located approximately 0.9-mile northeast of State Route (SR) 4 and approximately 0.8-mile east of SR 160. The site is identified by Assessor's Parcel Number (APN) 037-100-043-1.

Currently, the project site is undeveloped and consists of vacant land with ruderal vegetation and limited trees. Apart from the existing trees, the remaining portions of the site are composed of vacant ruderal grassland that appears to be regularly disked and heavily disturbed. The topography of the site is relatively flat and does not contain any hills. The project site is designated LI per the City's General Plan and is zoned LI.

Project Components

The proposed project would include the development of 22 single-family residences with lots ranging in size from 6,000-sf to 7,332-sf (see Figure 3). Each unit would have a private garage and driveway with access from the proposed roadway. A front, side, and rear private yard would be accessible from each unit.

Figure 1
Regional Project Location

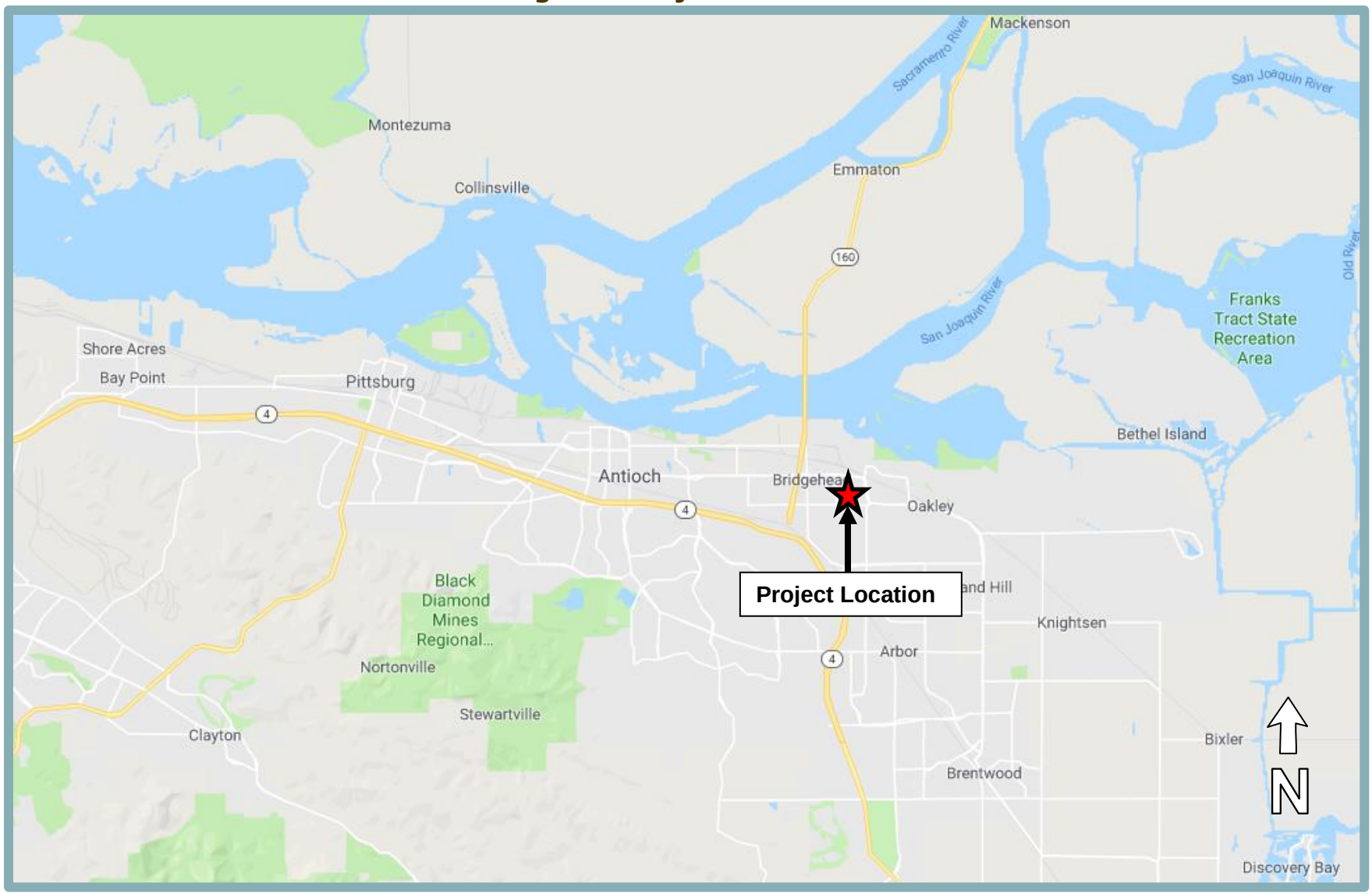
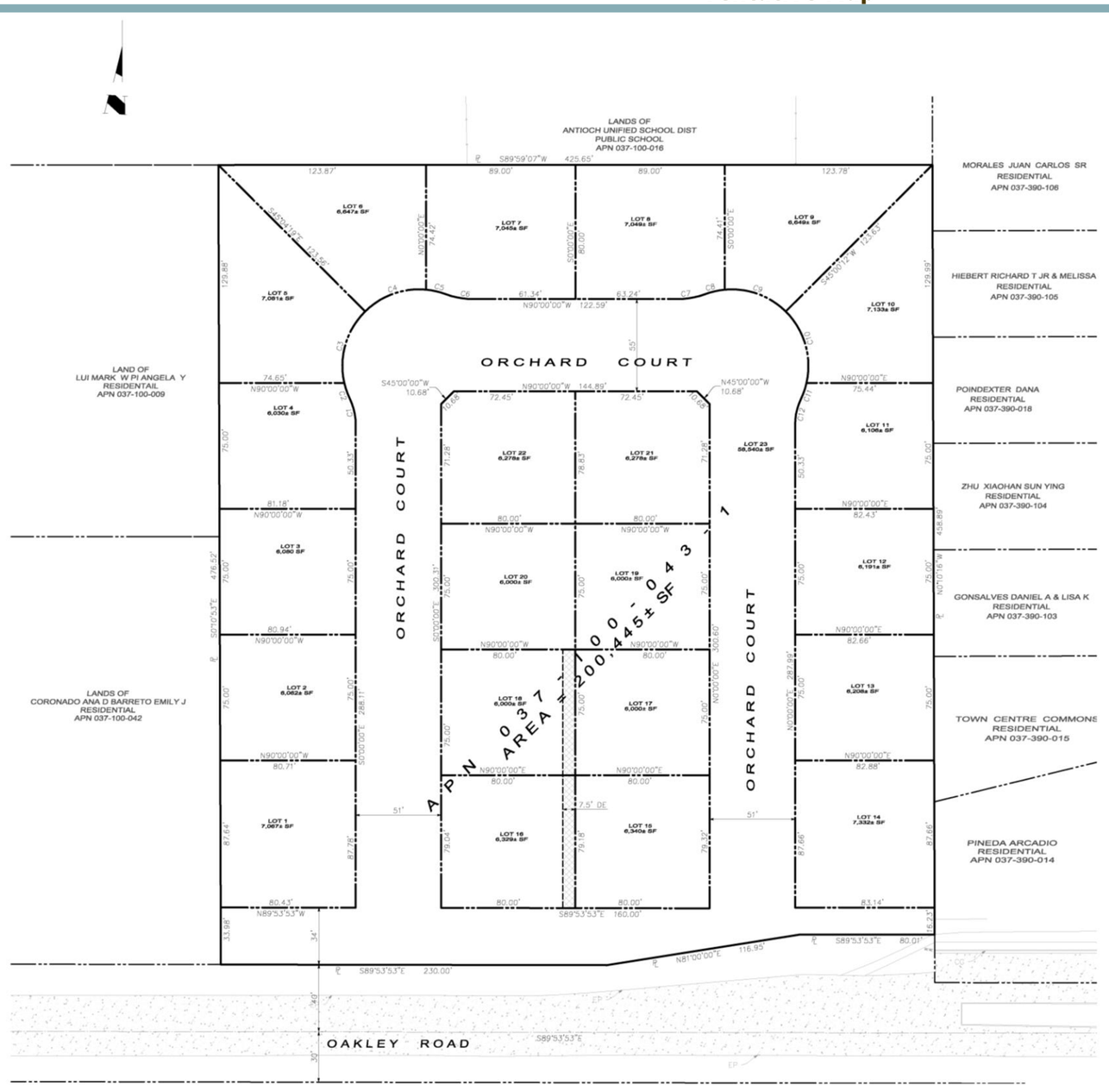


Figure 2
Project Site Boundaries

Figure 3
Tentative Map



CURVE TABLE				
CURVE #	LENGTH	RADIUS	DELTA	TANGENT
C1	15.63'	35.00	25°35'26"	7.95'
C2	10.14'	45.63	12°43'57"	5.09'
C3	46.36'	45.63	58°12'26"	25.40'
C4	39.89'	45.63	50°05'11"	21.32'
C5	12.01'	45.63	15°04'39"	6.04'
C6	16.34'	45.63	20°30'47"	8.26'
C7	16.34'	45.63	20°30'46"	8.26'
C8	12.10'	45.63	15°11'25"	6.08'
C9	39.86'	45.63	50°03'12"	21.30'
C10	46.29'	45.63	58°07'38"	25.36'
C11	10.14'	45.63	12°43'57"	5.09'
C12	15.63'	35.00	25°35'26"	7.95'

PERCENT OF LANDSCAPE COVERAGE

LOT #	LOT SIZE	BUILDING	DRIVEWAY & PARKING	LANDSCAPE AREA	PERCENT OF LANDSCAPE COVERAGE
1	7,067 SF	2,239 SF	905 SF	3,923 SF	55.51%
2	6,062 SF	1,999 SF	710 SF	3,353 SF	55.31%
3	6,080 SF	1,906 SF	1,053 SF	3,121 SF	51.33%
4	6,030 SF	1,474 SF	745 SF	3,811 SF	63.20%
5	7,081 SF	1,883 SF	756 SF	4,442 SF	62.73%
6	6,647 SF	1,474 SF	728 SF	4,445 SF	66.87%
7	7,045 SF	2,239 SF	800 SF	4,006 SF	56.86%
8	7,049 SF	2,239 SF	912 SF	3,898 SF	55.30%
9	6,649 SF	1,474 SF	827 SF	4,348 SF	65.39%
10	7,133 SF	1,999 SF	664 SF	4,470 SF	62.67%
11	6,106 SF	1,474 SF	859 SF	3,773 SF	61.79%
12	6,191 SF	1,906 SF	1,020 SF	3,265 SF	52.74%
13	6,208 SF	1,999 SF	710 SF	3,499 SF	56.36%
14	7,332 SF	2,239 SF	896 SF	4,197 SF	57.24%
15	6,340 SF	1,474 SF	682 SF	4,184 SF	65.99%
16	6,329 SF	1,474 SF	714 SF	4,141 SF	65.43%
17	6,000 SF	1,999 SF	764 SF	3,237 SF	53.95%
18	6,000 SF	1,906 SF	1,020 SF	3,074 SF	51.23%
19	6,000 SF	1,906 SF	1,160 SF	2,934 SF	48.90%
20	6,000 SF	1,474 SF	748 SF	3,778 SF	62.97%
21	6,278 SF	1,474 SF	748 SF	4,056 SF	64.61%
22	6,278 SF	1,474 SF	735 SF	4,069 SF	64.81%
23	58,540 SF		46,768 SF	11,772 SF	20.11%

Primary access to the site would be provided from Oakley Road through construction of a new looped, private access roadway. The new roadway would provide internal access to the proposed residences. Additionally, the proposed project would include stormwater treatment areas, a new right-of-way dedication, and frontage landscape improvements along Oakley Road. The project would require approval of a General Plan Amendment, Rezone, Tentative Map, and Design Review. The aforementioned project components are discussed in further detail below.

Proposed Residences

As discussed previously, the proposed single-family residences would be offered in four different layouts that all would include a two-car garage and a private driveway. Floorplans 1, 2, and 3 would include two-story residences and Floorplan 4 would include single-story residences. Units built with Floorplan 1 would contain three bedrooms. Units built with Floorplan 2 and Floorplan 3 would contain four bedrooms. Floorplan 4 would include single-story residences and contain three bedrooms. Additionally, as shown in Figure 4, each of the residences in the eastern and western portions of the site would be setback approximately 15 feet from the site boundary. The residences along the northern site boundary would be setback approximately 15 feet from the existing elementary school north of the site.

Access and Circulation

Access to the project site would be provided by two new entry points along Oakley Road through construction of a new looped, private access roadway (see Figure 4). The roadway would be two lanes and provide access to the proposed residences on the project site. Additionally, the new roadway would be approximately 32.82 feet wide before reaching the turns within the site, which would be designed as 90-degree elbow turns. The width of the street and elbow turns would allow for adequate emergency vehicle access at the project site.

Landscaping

As part of the proposed project, landscaping improvements would be included at the project site frontage, along Oakley Road (see Figure 5). A variety of trees and shrubs would be provided along the project frontage, as well as along the frontage of the residential lots. In addition, three bio-treatment areas would also be provided at the project site frontage. The bio-treatment areas would be landscaped with trees and shrubs, and would serve to treat stormwater on the project site.

Utilities

Water service for the proposed project would be provided by the Diablo Water District (DWD). The project would include construction of new water line extensions to connect to an existing water line within Oakley Road. The new water line extensions would run throughout the project site and would serve all units (see Figure 6). Sanitary sewer service is provided to the City of Oakley by the Ironhouse Sanitary District (ISD). The proposed project would include construction of new sanitary sewer extensions throughout the project site. The project would include connection of the proposed sanitary sewer lines within the site to an existing sewer line, located within Oakley Road.

Figure 4
Project Site Plan

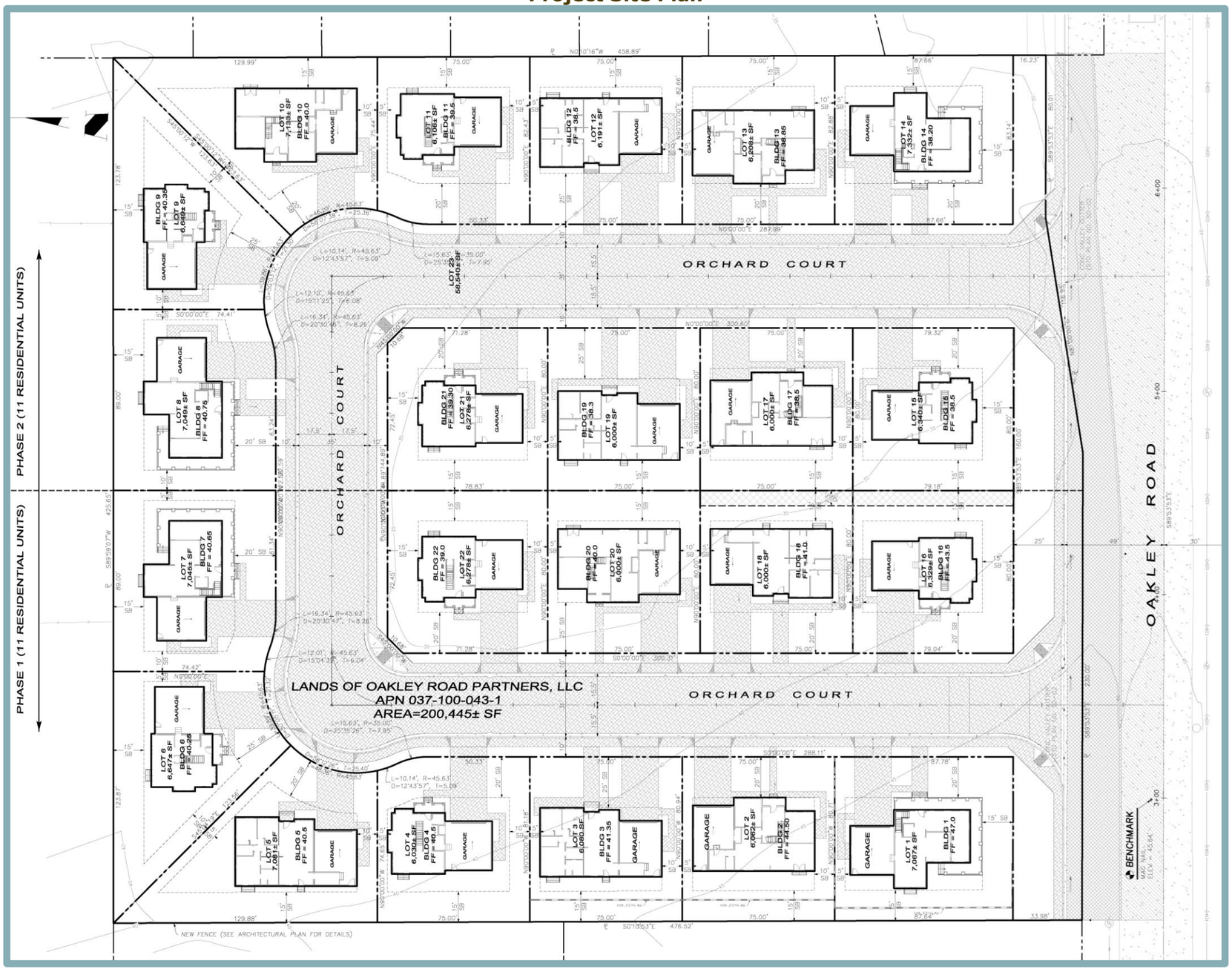
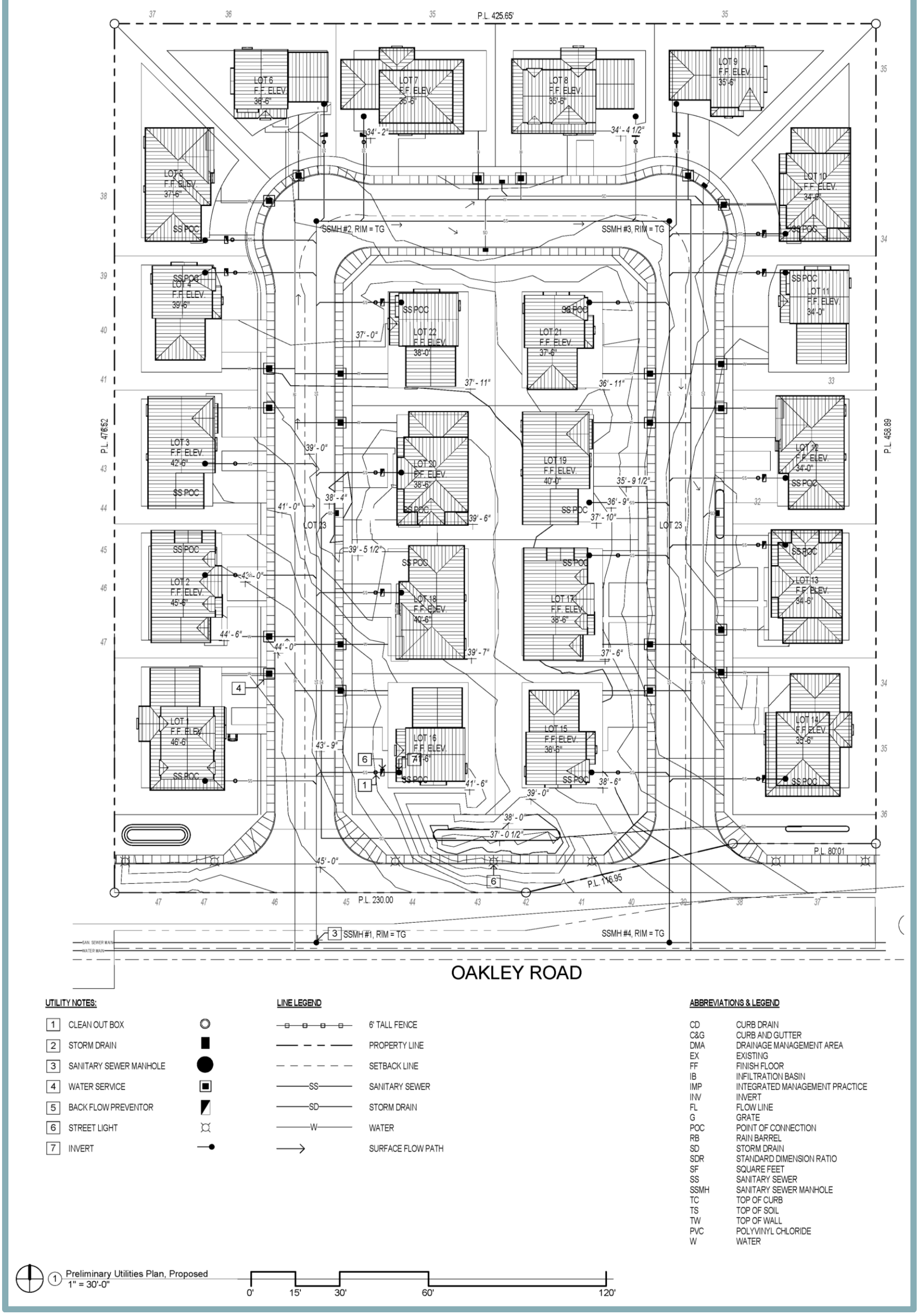


Figure 5
Landscape Plan

Figure 6
Preliminary Utility Plan



UTILITY NOTES:

1. CLEAN OUT BOX
2. STORM DRAIN
3. SANITARY SEWER MANHOLE
4. WATER SERVICE
5. BACK FLOW PREVENTOR
6. STREET LIGHT
7. INVERT

LINE LEGEND

- 6' TALL FENCE
- PROPERTY LINE
- SETBACK LINE
- SS — SANITARY SEWER
- SD — STORM DRAIN
- W — WATER
- SURFACE FLOW PATH

ABBREVIATIONS & LEGEND

CD	CURB DRAIN
C&G	CURB AND GUTTER
DMA	DRAINAGE MANAGEMENT AREA
EX	EXISTING
FF	FINISH FLOOR
IB	INFILTRATION BASIN
IMP	INTEGRATED MANAGEMENT PRACTICE
INV	INVERT
FL	FLOW LINE
G	GRATE
POC	POINT OF CONNECTION
RB	RAIN BARREL
SD	STORM DRAIN
SDR	STANDARD DIMENSION RATIO
SF	SQUARE FEET
SS	SANITARY SEWER
SSMH	SANITARY SEWER MANHOLE
TC	TOP OF CURB
TS	TOP OF SOIL
TW	TOP OF WALL
PVC	POLYVINYL CHLORIDE
W	WATER

① Preliminary Utilities Plan, Proposed
1" = 30'-0"

0' 15' 30' 60' 120'

Stormwater from impervious areas within the project site would be collected by a series of new storm drain inlets. Stormwater would then be conveyed to the proposed bio-treatment areas located at the project site frontage by way of drainage pipes. Stormwater would then be discharged into the City's storm drain system by connection to existing infrastructure within Oakley Road. Each bio-treatment area would be designed to properly treat stormwater on the project site prior to discharge into the City system.

General Plan Amendment

The proposed project would include a GPA to change the 4.6-acre project site from LI to Single-Family Residential, High Density (SH). The purpose of designating the site SH is to provide for moderately dense development that is consistent with existing suburban uses to the east. The designation allows for a minimum of 3.8 and maximum of 5.5 dwelling units per gross acre. The proposed project would include a density of approximately 4.78 dwelling units per acre, which is consistent with the SH land use designation.

Rezone

The proposed project would include a rezone of the project site from LI to Single-Family Residential (R-6). The purpose of the R-6 residential district regulation is to allow a designated area for single-family residential development. Approval of a rezone would ensure compatibility with surrounding land uses, and maintain substantial compliance with the City's General Plan following the amendment discussed above.

Design Review

Per Section 9.1.1604 of the City's Municipal Code, the proposed project would be subject to Design Review by the City. The proposed project would be reviewed based on the standards set forth in Section 9.1.1604. Specifically, the site plan would be analyzed based on elements of design, development location, arrangement of all structures, and design in harmony with surrounding facilities. The purpose of the regulations is to allow design review of all developments, signs, buildings, structures, and other facilities in order to further enhance the City's appearance, and the livability and usefulness of properties.

Discretionary Actions

The proposed project would require the following approvals from the City of Oakley:

- Adoption of the Initial Study/Mitigated Negative Declaration;
- Adoption of the Mitigation Monitoring and Reporting Program;
- General Plan Amendment of the 4.6-acre project site from LI to SH.
- Rezone of the site from LI to R-6;
- Tentative Subdivision Map; and
- Design Review of 22 single-family residences.

G. ENVIRONMENTAL CHECKLIST

The following checklist contains the environmental checklist form presented in Appendix G of the CEQA Guidelines. The checklist form is used to describe the impacts of the proposed project. A discussion follows each environmental issue identified in the checklist. For this checklist, the following designations are used:

Potentially Significant Impact: An impact that could be significant, and for which no mitigation has been identified. If any potentially significant impacts are identified, an EIR must be prepared.

Less Than Significant with Mitigation Incorporated: An impact that requires mitigation to reduce the impact to a less-than-significant level.

Less-Than-Significant Impact: Any impact that would not be considered significant under CEQA relative to existing standards.

No Impact: The project would not have any impact.

I. AESTHETICS. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Have a substantial adverse effect on a scenic vista?	☐	☐	✖	☐
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway?	☐	☐	✖	☐
c. In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	✖	☐
d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	✖	☐

Discussion

a. Examples of typical scenic vistas include mountain ranges, ridgelines, or bodies of water as viewed from a highway, public space, or other area designated for the express purpose of viewing and sightseeing. In general, a project's impact to a scenic vista would occur if development of the project would substantially change or remove a scenic vista. A scenic vista includes any such areas designated by a federal, state, or local agency. Scenic vistas in the City of Oakley, as defined by the City's General Plan, include natural landscape features such as the Delta, Dutch Slough, Marsh Creek, the Contra Costa Canal, agricultural and other open space lands, as well as views of Mount Diablo.[1] Views of the Delta, Dutch Slough, Marsh Creek, and the Contra Costa Canal are not available from the project site. Furthermore, the project site is located in a relatively urbanized area, and, thus, any potential views of Mount Diablo are blocked by surrounding development and existing vegetation.

The project site is currently designated by the City of Oakley General Plan as LI. While buildout of the site was not anticipated for residential uses, general development of the site has been anticipated, and development of residential uses would not result in greater impacts as compared to development of the site with industrial uses. As such, the proposed project is within the realm of what has been anticipated for the site and potential impacts to scenic resources resulting from development of the project have been analyzed in the General Plan EIR. Therefore, the proposed project would not have a substantial adverse effect on a scenic vista and a ***less-than-significant*** impact would occur.

b. According to the California Scenic Highway Mapping System, a portion of SR 4 and SR 160 are listed as eligible for State Scenic Highway designation. The project site is located approximately 0.9-mile east of SR 4 and approximately 0.8-mile east of SR 160. Views of the project site from either highway are not currently available due to the distance and surrounding urban development. Because the project site is not visible from either highway, the project would not have an adverse effect on the foregoing scenic resources from a State scenic highway.

[1] City of Oakley. *Oakley 2020 General Plan* [pg. 6-26]. December 16, 2002.

Therefore, development of the proposed project would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State Scenic Highway. Thus, a ***less-than-significant*** impact would occur.

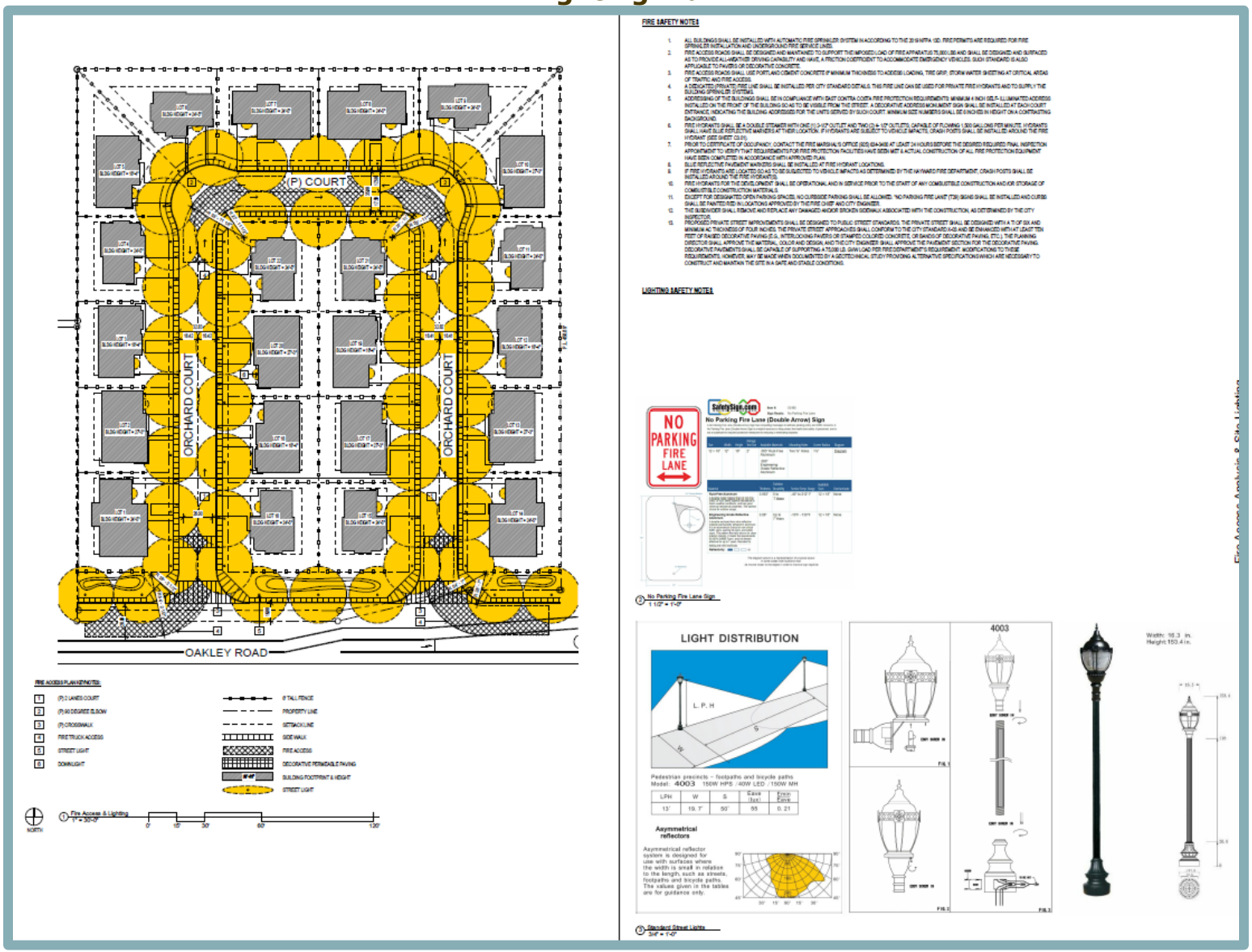
c. The project site is located within an urbanized area of the City. Currently, the project site is vacant and undeveloped, consisting of ruderal grasses and limited trees. The visual character of the site would be changed from the existing character; however, the single-family residences would be consistent with urban development in the surrounding area. Implementation of the proposed project would require Design Review.

Design Review would ensure that the aesthetic and architectural design of the development be compatible with surrounding development. The proposed project would include landscaping features at the project site frontage and within the project site that would be similar to existing features in the developments to the east of the site, along Oakley Road. As such, the residences would be designed in keeping with the surrounding residential land uses and, thus, would not substantially degrade the visual character of the project site or the surroundings and a ***less-than-significant*** impact would occur.

d. The project site does not contain any structures and, thus, does not currently emit any sources of light or glare. Development of the proposed residences would add new sources of light and glare to the site, where none currently exist. As shown in Figure 7, the proposed project would include street lights on the project site along the roadway and along the project site frontage. As previously discussed, the project site is surrounded by existing development including similar land uses. Light and glare associated with the proposed project would be expected to be similar to that of the surrounding area.

Furthermore, pursuant to Section 9.1.1604, the project would be required to undergo a design review to ensure that development of the project would be in compliance with the Residential Design Guidelines, including lighting standards therein, that establish the City's standard for residential street lights and limits residential lighting for security purposes. Therefore, any creation of new sources of light and glare by the future project would be considered a ***less-than-significant*** impact.

Figure 7
Lighting Plan



II. AGRICULTURE AND FOREST RESOURCES. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	✖	☐
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	✖
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	✖
d. Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	✖
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	✖	☐

Discussion

a,e. Per the Farmland Mapping and Monitoring Program, the project site is designated as "Farmland of Statewide Importance."[2] Farmland of Statewide Importance is defined as irrigated land that has a good combination of physical and chemical characteristics for the production of agricultural crops. However, according to the Department of Conservation, in order for land to be considered Farmland of Statewide Importance, the land must have been used for agricultural purposes within four years of the mapping date. Because the project site was mapped as Farmland of Statewide Importance in 2016, the site must have been used as agricultural land between 2012 and 2016 for the designation to be appropriate. Although the site appears to be regularly disked, the site does not appear to have been used for agricultural purposes in the recent past. As such, although the site is mapped Farmland of Statewide Importance, the designation does not accurately characterize the site.

Additionally, the project site is currently designated as LI and zoned LI. The City of Oakley General Plan EIR analyzed the impacts of Farmland of Statewide Importance conversion that would result from buildouts and determined the results would be less-than-significant. Given that the City's General Plan EIR designated the site for development, the conversion of Farmland of Statewide Importance has already been anticipated by the General Plan EIR. Because the conversion of Farmland of Statewide importance has been analyzed and evaluated by the General Plan EIR and the project would not result in new or more severe impacts, the projects impacts would be ***less-than-significant***.

[2] California Department of Conservation. *Contra Costa County Important Farmland Map.* 2016.

b. The project site is currently designated LI per the City's General Plan and is currently zoned LI; thus, the site is not zoned for agricultural use. Additionally, the site is not under a Williamson Act contract. Therefore, the proposed project would not conflict with existing zoning for agricultural use or conflict with a Williamson Act contract, and ***no impact*** would occur.

c,d. The project area is not considered forest land (as defined in Public Resources Code section 12220[g]), timberland (as defined by Public Resources Code section 4526), and is not zoned Timberland Production (as defined by Government Code section 51104[g]). Therefore, the proposed project would have ***no impact*** with regard to conversion of forest land or any potential conflict with forest land, timberland, or Timberland Production zoning.

III. AIR QUALITY. *Would the project:*	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
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?	☐	☐	✖	☐

Discussion

a,b. The City of Oakley is located in the San Francisco Bay Area Air Basin (SFBAAB), which is under the jurisdiction of the Bay Area Air Quality Management District (BAAQMD). The SFBAAB area is currently designated as a nonattainment area for State and federal ozone, State and federal fine particulate matter 2.5 microns in diameter ($PM_{2.5}$), and State respirable particulate matter 10 microns in diameter (PM_{10}) ambient air quality standards (AAQS). The SFBAAB is designated attainment or unclassified for all other AAQS. It should be noted that on January 9, 2013, the U.S. Environmental Protection Agency (USEPA) issued a final rule to determine that the Bay Area has attained the 24-hour $PM_{2.5}$ federal AAQS. Nonetheless, the Bay Area must continue to be designated as nonattainment for the federal $PM_{2.5}$ AAQS until such time as the BAAQMD submits a redesignation request and a maintenance plan to the USEPA, and the USEPA approves the proposed redesignation.

In compliance with regulations, due to the nonattainment designations of the area, the BAAQMD periodically prepares and updates air quality plans that provide emission reduction strategies to achieve attainment of the AAQS, including control strategies to reduce air pollutant emissions through regulations, incentive programs, public education, and partnerships with other agencies. The current air quality plans are prepared in cooperation with the Metropolitan Transportation Commission and the Association of Bay Area Governments (ABAG).

The most recent federal ozone plan is the 2001 Ozone Attainment Plan, which was adopted on October 24, 2001 and approved by the California Air Resources Board (CARB) on November 1, 2001. The plan was submitted to the USEPA on November 30, 2001 for review and approval. The most recent State ozone plan is the 2017 Clean Air Plan (CAP), adopted on April 19, 2017. The 2017 CAP was developed as a multi-pollutant plan that provides an integrated control strategy to reduce ozone, PM, toxic air contaminants (TACs), and greenhouse gases (GHGs). Although a plan for achieving the State PM_{10} standard is not required, the BAAQMD has prioritized measures to reduce PM in developing the control strategy for the 2017 CAP. The control strategy serves as the backbone of the BAAQMD's current PM control program.

The aforementioned air quality plans contain mobile source controls, stationary source controls, and transportation control measures to be implemented in the region to attain the State and federal AAQS within the SFBAAB. Adopted BAAQMD rules and regulations, as

well as the thresholds of significance, have been developed with the intent to ensure continued attainment of AAQS, or to work towards attainment of AAQS for which the area is currently designated nonattainment, consistent with applicable air quality plans. The BAAQMD's established significance thresholds associated with development projects for emissions of the ozone precursors reactive organic gases (ROG) and oxides of nitrogen (NO_x), as well as for PM_{10} and $PM_{2.5}$, expressed in pounds per day (lbs/day) and tons per year (tons/yr), are listed in Table 1. By exceeding the BAAQMD's mass emission thresholds for ROG, NO_X, PM_{10}, or $PM_{2.5}$, a project would be considered to conflict with or obstruct implementation of the BAAQMD's air quality planning efforts.

Table 1
BAAQMD Thresholds of Significance

	Construction	Operational	
Pollutant	**Average Daily Emissions (lbs/day)**	**Average Daily Emissions (lbs/day)**	**Maximum Annual Emissions (tons/year)**
ROG	54	54	10
NO_x	54	54	10
PM_{10} (exhaust)	82	82	15
$PM_{2.5}$ (exhaust)	54	54	10

Source: BAAQMD, CEQA Guidelines, May 2017.

The proposed project's construction and operational emissions were quantified using the California Emissions Estimator Model (CalEEMod) software version 2016.3.2 – a statewide model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify air quality emissions, including GHG emissions, from land use projects. The model applies inherent default values for various land uses, including construction data, vehicle mix, trip length, average speed, compliance with the 2016 California Building Standards Code (CBSC), etc. Where project-specific information is available, such information should be applied in the model. Accordingly, the proposed project's modeling assumes the following project and/or site-specific information:

- Construction would begin in May 2020;
- Construction would occur over an approximately two-year period;
- A total of 4.604 acres of the site would be graded;
- On-site renewable energy systems would be used to generate 100 percent of anticipated electricity use per the 2019 CBSC; and
- An average vehicle trip rate of 9.44 was applied based on project-specific information provided by KD Anderson & Associates, Inc.

The proposed project's estimated emissions associated with construction and operations are presented and discussed in further detail below. A discussion of the proposed project's contribution to cumulative air quality conditions is provided below as well. All CalEEMod results are included as Appendix A to this IS/MND.

Construction Emissions

According to the CalEEMod results, the proposed project would result in maximum unmitigated construction criteria air pollutant emissions as shown in Table 2. As shown in

the table, the proposed project's construction emissions would be below the applicable thresholds of significance.

Table 2
Maximum Unmitigated Construction Emissions (lbs/day)

Pollutant	Proposed Project Emissions	Threshold of Significance	Exceeds Threshold?
ROG	31.20	54	**NO**
NO_X	42.46	54	**NO**
PM_{10} (exhaust)	2.20	82	**NO**
PM_{10} (fugitive)	18.21	None	**N/A**
$PM_{2.5}$ (exhaust)	2.02	54	**NO**
$PM_{2.5}$ (fugitive)	9.97	None	**N/A**

Source: CalEEMod, February 2020 (see Appendix A).

All projects under the jurisdiction of the BAAQMD are required to implement all of the BAAQMD's Basic Construction Mitigation Measures, which include the following:

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
4. All vehicle speeds on unpaved roads shall be limited to 15 mph.
5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
6. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator.
8. Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

The proposed project's required implementation of the BAAQMD's Basic Construction Mitigation Measures listed above would help to further minimize construction-related emissions.

Because the proposed project would be below the applicable thresholds of significance for construction emissions, project construction would not result in a significant air quality impact.

Operational Emissions

According to the CalEEMod results, the proposed project would result in maximum unmitigated operational criteria air pollutant emissions as shown in Table 3.

Table 3
Unmitigated Maximum Operational Emissions

Pollutant	Proposed Project Emissions		Threshold of Significance		Exceeds Threshold?
	lbs/day	tons/yr	lbs/day	tons/yr	
ROG	24.21	0.37	54	10	**NO**
NO_X	2.04	0.29	54	10	**NO**
PM_{10} (exhaust)	4.20	0.03	82	15	**NO**
PM_{10} (fugitive)	1.07	0.18	None	None	**N/A**
$PM_{2.5}$ (exhaust)	4.20	0.03	54	10	**NO**
$PM_{2.5}$ (fugitive)	0.29	0.05	None	None	**N/A**

Source: CalEEMod, February 2020 (see Appendix A).

As shown in the table, the proposed project's operational emissions would be below the applicable thresholds of significance. Thus, the proposed project would not be considered to conflict with air quality plans during project operations.

Cumulative Emissions

Past, present, and future development projects contribute to the region's adverse air quality impacts on a cumulative basis. By nature, air pollution is largely a cumulative impact. A single project is not sufficient in size to, by itself, result in nonattainment of AAQS. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's contribution to the cumulative impact is considerable, then the project's impact on air quality would be considered significant. In developing thresholds of significance for air pollutants, BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. The thresholds of significance presented in Table 1 represent the levels at which a project's individual emissions of criteria air pollutants or precursors would result in a cumulatively considerable contribution to the SFBAAB's existing air quality conditions. If a project exceeds the significance thresholds presented in Table 1, the proposed project's emissions would be cumulatively considerable, resulting in significant adverse cumulative air quality impacts to the region's existing air quality conditions. Because the proposed project would result in emissions below the applicable thresholds of significance, the project would not be expected to result in a cumulatively considerable contribution to the region's existing air quality conditions.

Conclusion

As stated previously, the applicable regional air quality plans include the 2001 Ozone Attainment Plan and the 2017 CAP. According to BAAQMD, if a project would not result in significant and unavoidable air quality impacts, after the application of all feasible mitigation, the project may be considered consistent with the air quality plans. Because the proposed project would result in emissions below the applicable thresholds of significance, the project would not be considered to conflict with or obstruct implementation of regional air quality plans.

Because the proposed project would not conflict with or obstruct implementation of the applicable air quality plans, violate any air quality standards or contribute substantially to an existing or projected air quality violation, or result in a cumulatively considerable net increase in any criteria air pollutant, impacts would be considered ***less than significant***.

c. Some land uses are considered more sensitive to air pollution than others, due to the types of population groups or activities involved. Heightened sensitivity may be caused by health problems, proximity to the emissions source, and/or duration of exposure to air pollutants. Children, pregnant women, the elderly, and those with existing health problems are especially vulnerable to the effects of air pollution. Sensitive receptors are typically defined as facilities where sensitive receptor population groups (i.e., children, the elderly, the acutely ill, and the chronically ill) are likely to be located. Accordingly, land uses that are typically considered to be sensitive receptors include residences, schools, playgrounds, childcare centers, retirement homes, convalescent homes, hospitals, and medical clinics. The nearest existing sensitive receptor would be the single-family residences located to the east and west, as well as the elementary school to the north.

The major pollutant concentrations of concern are localized carbon monoxide (CO) emissions, toxic air contaminant (TAC), and criteria pollutant emissions, which are addressed in further detail below.

Localized CO Emissions

Localized concentrations of CO are related to the levels of traffic and congestion along streets and at intersections. High levels of localized CO concentrations are only expected where background levels are high, and traffic volumes and congestion levels are high. Emissions of CO are of potential concern, as the pollutant is a toxic gas that results from the incomplete combustion of carbon-containing fuels such as gasoline or wood.

In order to provide a conservative indication of whether a project would result in localized CO emissions that would exceed the applicable threshold of significance, BAAQMD has established screening criteria for localized CO emissions. According to BAAQMD, a proposed project would result in a less-than-significant impact related to localized CO emission concentrations if all of the following conditions are true for the project:

- The project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, regional transportation plan, and local congestion management agency plans;
- The project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour; and
- The project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, underpass, etc.).

Based on intersection volumes in the project area, the proposed project would not increase traffic volumes at an affected intersection to more than 44,000 vehicles per hour.[3] Furthermore, areas where vertical and/or horizontal mixing is limited due to tunnels, underpasses, or similar features do not exist in the project area. Therefore, based on the

[3] KD Anderson & Associates, Inc. *Traffic Impact Assessment for 22 Lot Subdivision Proposed at 2480 Oakley Road, Oakley, California.* April 30, 2019.

BAAQMD's screening criteria for localized CO emissions, the proposed project would not be expected to result in substantial levels of localized CO at surrounding intersections or generate localized concentrations of CO that would exceed standards or cause health hazards.

TAC Emissions

Another category of environmental concern is TACs. The CARB's *Air Quality and Land Use Handbook: A Community Health Perspective* (Handbook) provides recommended setback distances for sensitive land uses from major sources of TACs, including, but not limited to, freeways and high traffic roads, distribution centers, and rail yards. The CARB has identified diesel particulate matter (DPM) from diesel-fueled engines as a TAC; thus, high volume freeways, stationary diesel engines, and facilities attracting heavy and constant diesel vehicle traffic are identified as having the highest associated health risks from DPM. Health risks associated with TACs are a function of both the concentration of emissions and the duration of exposure, where the higher the concentration and/or the longer the period of time that a sensitive receptor is exposed to pollutant concentrations would correlate to a higher health risk. The nearest sensitive receptors to the project site are the single-family residences located to the east and west, as well as the elementary school to the north.

The proposed project does not include any operations that would be considered a substantial source of TACs. Accordingly, operations of the proposed project would not expose sensitive receptors to excess concentrations of TACs.

Short-term, construction-related activities could result in the generation of TACs, specifically DPM, from on-road haul trucks and off-road equipment exhaust emissions. However, as discussed above, construction is temporary and occurs over a relatively short duration in comparison to the operational lifetime of the proposed project. Health risks are typically associated with exposure to high concentrations of TACs over extended periods of time (e.g., 30 years or greater), whereas the construction period associated with the proposed project would likely be limited to approximately two years. All construction equipment and operation thereof would be regulated per the In-Use Off-Road Diesel Vehicle Regulation, which is intended to help reduce emissions associated with off-road diesel vehicles and equipment, including DPM. Project construction would also be required to comply with all applicable BAAQMD rules and regulations, particularly associated with permitting of air pollutant sources.

In addition, the general westerly flow of the winds from the Carquinez Strait tends to move pollutants east. Prevailing winds in the region are generally strong, and would act to dilute pollutants and transport them away from the area, so that emissions released in the project area would have a low potential to affect any single receptor. The westerly pattern of air movement would generally disperse pollutants released within the project site, away from the elementary school, and toward the existing residences to the east of the project site. However, according to BAAQMD, research conducted by CARB indicates that DPM is highly dispersive in the atmosphere and is reduced by 70 percent at a distance of approximately 500 feet. Thus, emissions at the project site would be substantially dispersed at nearby sensitive receptors.

Furthermore, because construction equipment on-site would not operate for long periods of time and would be used at varying locations within the site, associated emissions of DPM would not occur at the same location (or be evenly spread throughout the entire

project site) for long periods of time. Due to the temporary nature of construction and the relatively short duration of potential exposure to associated emissions, the potential for any one sensitive receptor in the area to be exposed to concentrations of pollutants for a substantially extended period of time would be low. Therefore, construction of the proposed project would not be expected to expose nearby sensitive receptors to substantial pollutant concentrations.

Criteria Pollutants

The BAAQMD thresholds of significance were established with consideration given to the health-based air quality standards established by the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS), and are designed to aid the district in achieving attainment of the NAAQS and CAAQS,[4] for which the SFBAAB is in nonattainment, but the thresholds of significance do not represent a level above which individual project-level emissions would directly result in public health impacts. Rather, the thresholds of significance represent emissions levels that would ensure that project-specific emissions would not inhibit attainment of regional NAAQS and CAAQS. Considering that implementation of the proposed project would not result in short-term construction-related or long-term operational emissions of criteria pollutants that would exceed BAAQMD standards, the proposed project would not inhibit attainment of regional NAAQS and CAAQS.

Conclusion

Based on the above discussion, the proposed project would not expose any sensitive receptors to substantial concentrations of pollutants, including localized CO, TACs, or criteria pollutants, during construction or operation. Therefore, the proposed project would result in a ***less-than-significant*** impact related to the exposure of sensitive receptors to substantial pollutant concentrations.

d. Emissions such as those leading to odor have the potential to adversely affect people. Emissions of principal concern include emissions leading to odors, emission that have the potential to cause dust, or emissions considered to constitute air pollutants. Air pollutants have been discussed in sections “a” through “c” above. Therefore, the following discussion focuses on emissions of odors and dust.

Per the BAAQMD CEQA Guidelines, odors are generally regarded as an annoyance rather than a health hazard.[5] Manifestations of a person’s reaction to odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache). The presence of an odor impact is dependent on a number of variables including: the nature of the odor source; the frequency of odor generation; the intensity of odor; the distance of odor source to sensitive receptors; wind direction; and sensitivity of the receptor.

Due to the subjective nature of odor impacts, the number of variables that can influence the potential for an odor impact, and the variety of odor sources, quantitative analysis to determine the presence of a significant odor impact is difficult. Typical odor-generating land uses include, but are not limited to, wastewater treatment plants, landfills, and composting facilities. The proposed project would not introduce any such land uses and is not located in the vicinity of any such existing or planned land uses.

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4 Bay Area Air Quality Management District. *California Environmental Quality Act Air Quality Guidelines*. May 2017.
5 Bay Area Air Quality Management District. *California Environmental Quality Act Air Quality Guidelines*. May 2017.

Construction activities often include diesel-fueled equipment and heavy-duty trucks, which could create odors associated with diesel fumes that may be considered objectionable. However, construction activities would be temporary, and hours of operation for construction equipment would be restricted to the hours of 7:30 AM and 5:30 PM on Monday through Friday per Section 4.2.208 of the City of Oakley Municipal Code. Project construction would also be required to comply with all applicable BAAQMD rules and regulations, particularly associated with permitting of air pollutant sources. The aforementioned regulations would help to minimize emissions, including emissions leading to odors. Accordingly, substantial objectionable odors would not be expected to occur during construction activities.

It should be noted that BAAQMD regulates objectionable odors through Regulation 7, Odorous Substances, which does not become applicable until the Air Pollution Control Officer (APCO) receives odor complaints from ten or more complainants within a 90-day period. Once effective, Regulation 7 places general limitation on odorous substances and specific emission limitations on certain odorous compounds, which remain effective until such time that citizen complaints have been received by the APCO for one year. The limits of Regulation 7 become applicable again when the APCO receives odor complaints from five or more complainants within a 90-day period. Thus, although not anticipated, if odor complaints are made after the proposed project is developed, the BAAQMD would ensure that such odors are addressed and any potential odor effects are minimized or eliminated.

With respect to dust, as noted previously, all projects under the jurisdiction of BAAQMD are required to implement the BAAQMD's Basic Construction Mitigation Measures. While the project may require movement of material to and from the site, all haul trucks with loose material are required to be covered, which would ensure that material from the site would not create significant amounts of dust during transport. Additionally, the Construction Mitigation Measures limit vehicle speeds within the project site and require removal of all mud or dirt tracked on to adjacent roads, which would ensure that construction of the proposed project does not result in substantial emissions of dust. Following project construction, vehicles operating within the project site would be limited to paved areas of the site, and non-paved areas would be landscaped. Thus, project operations would not include sources of dust that could adversely affect a substantial number of people.

For the aforementioned reasons, construction and operation of the proposed project would not result in emissions (such as those leading to odors) adversely affecting a substantial number of people, and a ***less-than-significant*** impact would result.

IV. BIOLOGICAL RESOURCES. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
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, and regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?	☐	☐	✖	☐
c. Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	✖	☐
d. Interfere substantially with the movement of any resident or migratory fish or wildlife species or with established resident or migratory wildlife corridors, or impede the use of 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 Conservation Community Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	✖	☐

Discussion

The following discussion based primarily on a Planning Survey Report (PSR), prepared by Gallaway Enterpries for the proposed project.[6] The PSR is included within Appendix B to this IS/MND.

a. Currently, the project site is undeveloped and consists of vacant land with ruderal vegetation and limited trees. The project site also appears to have been subject to previous disturbance and is regularly disked.

Special-status species include those plant and wildlife species that have been formally listed, are proposed as endangered or threatened, or are candidates for such listing under the federal and State Endangered Species Acts. Both acts afford protection to listed and proposed species. In addition, California Department of Fish and Wildlife (CDFW) Species of Special Concern, which are species that face extirpation in California if current population and habitat trends continue, U.S. Fish and Wildlife Service (USFWS) Birds of Conservation Concern, sensitive species included in USFWS Recovery Plans, and CDFW special-status invertebrates are all considered special-status species. Although CDFW Species of Special Concern generally do not have special legal status, they are given special consideration under CEQA. In addition to regulations for special-status species,

[6] Gallaway Enterprises. *Planning Survey Report.* April 2019.

most birds in the U.S., including non-status species, are protected by the Migratory Bird Treaty Act (MBTA) of 1918. Under the MBTA, destroying active nests, eggs, and young is illegal. Species that meet the definition of rare, threatened, or endangered under Section 15380 of the CEQA guidelines are also considered special-status species. In addition, plant species on California Native Plant Society (CNPS) categories 1A, 1B, 2B, 3, and 4 are considered special-status plant species and are protected under CEQA.

The project site is located within the boundaries of the East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan (ECCCHCP/NCCP), which is intended to provide an effective framework to protect natural resources in the County, including special-status species. In compliance with the ECCCHCP/NCCP, a PSR was prepared for the proposed project by Gallaway Enterprises. Per the PSR, approximately 3.00 acres of the site are categorized by the Grassland (Ruderal) land cover type and 1.60 acres of the site are considered Developed (Urban). Based on the land cover types found on-site, Gallaway Enterprises conducted planning-level surveys on the project site for San Joaquin kit fox, western burrowing owl, Swainson's hawk, and golden eagle.

In addition, Gallaway Enterprises conducted a search of the California Natural Diversity Database (CNDDB) for the project site quadrangle, Brentwood, as well as three surrounding quadrangles (Jersey Island, Antioch North, and Antioch South). The intent of the database review was to identify documented occurrences of special-status species in the vicinity of the project area, to determine their locations relative to the project site, and to evaluate whether the site meets the habitat requirements of such species. Based on the results of the CNDDB search, four special-status plant species and four special-status wildlife species warranted further consideration.

The potential for species covered by the ECCCHCP/NCCP and other special-status species to occur on the project site is discussed in further detail below.

Special-Status Plants

Special-status plants generally occur in relatively undisturbed areas within vegetation communities such as vernal pools, marshes and swamps, chenopod scrub, seasonal wetlands, riparian scrub, chaparral, alkali playa, dunes, and areas with unusual soil characteristics.

Based on the results of the CNDDB search, four plant species warranted further consideration given the presence of marginal or suitable habitat within the project site. The four plant species include diamond-petaled poppy, large-flowered fiddleneck, round-leaved filaree, and showy madia. As a result, Gallaway Enterprises conducted a field survey of the site to assess potentially suitable habitat for special-status plants and whether special-status plants are present on-site. The site was systematically searched by walking throughout the site. The field survey did not indicate the presence of any special-status plant species within the project site.

Due to the absence of special-status plants within the site, construction activities associated with the proposed project would not result in adverse effects to special-status plant species.

Special-Status Wildlife

As noted previously, the PSR concluded that four special-status wildlife species required further planning surveys. The surveys were conducted in accordance with Section 6.3.1 of the ECCCHCP/NCCP and focused on identifying and evaluating potentially suitable habitat for the covered species and the presence of suitable habitat features that could suggest past or current inhabitance of the site that may have been disturbed through regular disking.

Despite the low quality of the existing habitat within the project site, the on-site ruderal grassland and nearby trees provide potential habitat for San Joaquin kit fox (*Vulpes macrotis mutica*) western burrowing owl (*Athene cunnicularia*), Swainson's hawk (*Buteo swainsoni*), and golden eagle (*Aquila chrysaetos*). Furthermore, other avian species protected by the MBTA could use the existing grassland as foraging and potential nesting habitat.

San Joaquin Kit Fox

San Joaquin kit fox can often be found in chenopod scrub and valley or foothill grassland. The project site contains ruderal grassland within the range of San Joaquin kit fox. CNDDB contains one record of the species approximately eight miles from the project site. San Joaquin kit fox have been known to breed and forage in ruderal land-cover; however, the survey results indicated that the project site does not provide suitable denning habitat. In addition, the area likely does not provide suitable foraging habitat due to the lack of nearby occurrences. Therefore, the proposed project would not result in any significant adverse effects to San Joaquin kit fox.

Western Burrowing Owl

The primary habitat requirement for western burrowing owls is small mammal burrows that the species uses for nesting. Typically, the species uses abandoned ground squirrel burrows, but western burrowing owls have been known to dig burrows in softer soils. In urban areas, western burrowing owls may use pipes, culverts, and piles of material as artificial burrows. Western burrowing owls breed semi-colonially from March through August.

The project site contains ruderal grassland within the range of western burrowing owl. CNDDB contains a record of the species within one mile of the project site. As part of the planning survey, the site was inspected for burrowing owls and ground squirrel burrows with evidence of burrowing owl occupancy (i.e., white wash, pellets, feathers). Burrowing owls or burrows with evidence of burrowing owl occupancy were not observed during the survey. Therefore, the proposed project would not result in any significant adverse effects to western burrowing owl.

Swainson's Hawk

Per the PSR, the CNDDB records show that a breeding pair of Swainson's hawks were located within a mile of the site in 2012. As part of the PSR, trees on the site, and visible from the site, were inspected for raptor stick nests. Raptor stick nests were not observed in the on-site trees or in trees visible from the site. In addition, Swainson's hawks were not observed during the field survey; however, Swainson's hawk could use the ruderal land-cover found within the site to forage, should an occupied nest be located nearby.

Given that the site is located near the Swainson's hawk nesting range, the species could nest in trees located within 1,000 feet of the site. Therefore, pre-construction surveys for Swainson's hawk are required by the ECCCHCP/NCCP to confirm presence or absence of the species. If the species does occur on or near the project site, implementation of the proposed project could result in direct take or nest abandonment, which would be considered significant adverse impacts.

Golden Eagle

The project site contains ruderal grassland that is located within the range of the golden eagle. The CNDDB does not identify any occurrences of golden eagle within 0.5-mile of the site. In addition, the species typically nests more often on cliffs in remote natural areas than in trees near urban areas. Nonetheless, pre-construction surveys for golden eagle are required by the ECCCHCP/NCCP to confirm presence or absence of the species. If golden eagle is present on or near the project site, the proposed project could result in significant adverse impacts to the species.

Nesting Raptors and Migratory Birds

The project site contains existing trees that could be used by raptors and other migratory birds protected by the MBTA for nesting. Such trees would be removed as part of the proposed project. Construction activities that adversely affect the nesting success of raptors and migratory birds (i.e., lead to the abandonment of active nests) or result in mortality of individual birds constitute a violation of State and federal laws. Thus, in the event that such species occur on or near the project site during the breeding season, project construction activities could result in an adverse effect to species protected under the MBTA.

Conclusion

Based on the above, the field survey did not identify any special-status species within the project site and the site is considered low-quality habitat. Special-status species are unlikely to occur on-site during construction of the proposed project. However, per the ECCCHCP/NCCP, pre-construction surveys are required for Swainson's hawk and golden eagle. In addition, the site and surrounding area contains suitable nest trees for nesting raptors and migratory birds protected by the MBTA. Thus, the proposed project could have an adverse effect, either directly or through habitat modifications, on species identified as special-status species in local or regional plans, policies, or regulations, or by the CDFW or the USFWS, and a ***potentially significant*** impact could result.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above impact to a *less-than-significant* level.

IV-1. *Prior to the approval of a grading permit, the developer shall pay the applicable ECCCHCP/NCCP per-acre fee in effect for the applicable zone in compliance with Section 9.2.712 of the Oakley Municipal Code.*

Swainson's Hawk

IV-2. *Prior to any ground disturbance related to activities covered under the ECCCHCP/NCCP, which are conducted during the nesting season (March 15 to September 15), a qualified biologist shall conduct a preconstruction survey no more than one month prior to construction in order to establish*

whether occupied Swainson's hawk nests are located within 1,000 feet of the project site. A written summary of the survey results shall be submitted to the City of Oakley Planning Division. If occupied nests are not found during the survey, further mitigation is not required.

IV-3. *If potentially occupied nests within 1,000 feet are off the project site, then their occupancy will be determined by observation from public roads or by observations of Swainson's hawk activity (e.g., foraging) near the project site. If nests are occupied, minimization measures and construction monitoring are required (see below).*

During the nesting season (March 15 to September 15), covered activities within 1,000 feet of occupied nests or nests under construction shall be prohibited to prevent nest abandonment. If site-specific conditions or the nature of the covered activity (e.g., steep topography, dense vegetation, limited activities) indicate that a smaller buffer could be used, the project applicant shall coordinate with CDFW/USFWS to determine the appropriate buffer size. If young fledge prior to September 15, covered activities may proceed normally. If the active nest site is shielded from view and noise from the project site by other development, topography, or other features, the project applicant may apply to the City of Oakley Planning Division for a waiver of this avoidance measure. Any waiver must also be approved by USFWS and CDFW. While the nest is occupied, activities outside the buffer may take place.

All active nest trees shall be preserved on site, if feasible. Nest trees, including non-native trees, lost to covered activities shall be mitigated by the project proponent according to the requirements below.

Golden Eagle

IV-4. *Prior to implementation of covered activities, a qualified biologist shall conduct a preconstruction survey to establish whether nests of golden eagles are occupied. If nests are occupied minimization requirements and construction monitoring shall be required. If occupied nests are not found during the survey, further mitigation is not required. A written summary of the survey results shall be submitted to the City of Oakley Planning Division.*

IV-5. *If nests are occupied, minimization requirements and construction monitoring shall be required.*

Covered activities shall be prohibited within 0.5-mile of active nests. Nests can be built and active at almost any time of the year, although mating and egg incubation occurs late January through August, with peak activity in March through July. If site-specific conditions or the nature of the covered activity (e.g., steep topography, dense vegetation, limited activities) indicate that a smaller buffer could be appropriate or that a larger buffer should be implemented, the project applicant shall coordinate with CDFW/USFWS to determine the appropriate buffer size.

Construction monitoring shall focus on ensuring that covered activities do not occur within the buffer zone established around an active nest. Although known golden eagle nest sites do not occur within or near the Urban Limit Line (ULL), covered activities inside and outside of the Preserve System have the potential to disturb golden eagle nest sites. Construction monitoring shall ensure that direct effects to golden eagles are minimized.

Nesting Raptors and Migratory Birds

IV-6. *Prior to any ground disturbance related to covered activities during the nesting season (March 15 to September 15), a qualified biologist shall conduct a preconstruction survey 30 days or less prior to construction in order to establish whether occupied migratory bird and/or raptor nests are located within 250 feet of the project site. A written summary of the survey results shall be submitted to the City of Oakley Planning Division. If occupied nests occur on-site or within 250 feet of the project site, then Mitigation Measure IV-7 shall be implemented. If occupied nests are not found, further mitigation is not necessary.*

IV-7. *During the nesting season (March 15 to September 15), if occupied nests occur on-site or within 250 feet of the project site, covered activities within 250 feet of occupied nests or nests under construction shall be prohibited to prevent nest abandonment. If site-specific conditions, or the nature of the covered activity (e.g., dense vegetation, limited activities) indicate that a smaller buffer could be used, the project applicant may coordinate with CDFW/USFWS to determine the appropriate buffer size. If young fledge prior to September 15, covered activities can proceed normally.*

b,c. According to the PSR, the site consists of ruderal grassland habitats that support upland grasses and weeds. The project site does not contain riparian habitat or other sensitive natural communities, including wetlands, or potentially jurisdictional waters of the State. Therefore, the proposed project would not have a substantial adverse effect on riparian habitat, sensitive natural communities, or federally protected wetlands, and a ***less-than-significant*** impact would occur.

d. The project site is located in an urbanized area and is bordered by existing residential to the east and west, an elementary school to the north, and Oakley Road to the south. Thus, the project site does not support any substantial wildlife movement corridors. As such, the project would not interfere substantially with the movement of any resident or migratory fish or wildlife species or with established resident or migratory wildlife corridors, or impede the use of wildlife nursery sites, and a ***less-than-significant*** impact would occur.

e. According to the PSR a grouping of non-native trees along the western site boundary would be removed. The trees consist of mostly trees of heaven, a few almond trees, and a single black walnut tree.

Section 9.1.1112 of the Municipal Code defines protected trees and heritage trees, and establishes requirements governing the removal of such. Section 9.1.1112 defines a protected tree as any tree adjacent to or part of a riparian habitat, foothill woodland, or oak savanna that measures twenty inches or larger and an indigenous tree that measures forty inches or larger. In addition, Section 9.1.1112 defines a heritage tree as a California native

oak that measures at least 50 inches in circumference. The on-site trees do not meet the City's definition of protected or heritage tress. Because the trees located on the project site would not be considered a protected tree or heritage tree, the removal of the on-site trees and vegetation would not be significant.

Based on the above, the proposed project would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance, and a ***less-than-significant*** impact would occur.

f. The project site is located within the boundaries of the ECCCHCP/NCCP, which establishes an effective framework to protect natural resources in eastern Contra Costa County, while improving and streamlining the environmental permitting process for impacts on endangered species and provides guidance for the mitigation of impacts to covered species. As noted previously, the site is within the range of potential habitat for several wildlife species covered under the ECCCHCP/NCCP. The PSR and field survey for the proposed project were conducted in adherence with requirements of the ECCCHCP/NCCP. Applicable Avoidance and Minimization Measures for Swainson's hawk, golden eagle, and nesting and migratory birds, as adapted from Chapter 6 of the ECCCHCP/NCCP, have been included in Mitigation Measures IV-2 through IV-7 of this IS/MND. Additionally, the proposed project would be subject to pay all applicable fees according to the Fee Zone Map of the ECCCHCP/NCCP prior to construction (Mitigation Measure IV-1). The developer would be required to pay the appropriate fees based on the applicable fee calculator at the time of development. Therefore, the proposed project would not conflict with the applicable provisions of the ECCCHCP/NCCP and a ***less-than-significant*** impact would occur related to conflicts with an adopted HCP, NCCP, or other approved local, regional, or State HCP.

V. CULTURAL RESOURCES. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?	☐	✖	☐	☐
b. Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to Section 15064.5?	☐	✖	☐	☐
c. Disturb any human remains, including those interred outside of dedicated cemeteries.	☐	✖	☐	☐

Discussion

The following is primarily based on a Cultural Resources Study prepared for the proposed project by Tom Origer & Associates.[7]

a. The Cultural Resources Study consisted of a literature review to identify any previously recorded cultural resources and a field survey, conducted on February 13, 2020, of the entire project site. The field survey included surface examination and excavation using a hand-auger. On February 4, 2020, a records search of the California Historic Resources Information System (CHRIS) was completed for cultural resources site records and survey reports in Contra Costa County by the North West Information Center. The literature review did not reveal any new information about the project site as the site has not been subject to any previous cultural studies. Three studies have been conducted within a quarter mile of the site; however, cultural resources are not known to exist in the project area.

The field survey identified scattered pieces of lumber in the northwest corner of the project site. In addition, agricultural equipment was found at the project site and presumed to have been placed there in recent decades. In order to determine whether the lumber and agricultural equipment are historically significant, the features were evaluated using the National Register of Historic Places (NRHP) and the California Register of Historic Resources (CRHR) eligibility criteria.

The NRHP and CRHR eligibility criteria include the following:

(1)/(A) It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the U.S.;
(2)/(B) It is associated with the lives of persons important to local, California, or national history;
(3)/(C) It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or
(4)/(D) It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

[7] Tom Origer & Associates. *Cultural Resources Study of the Property at 2480 Oakley Road, Oakley, Contra Costa County, California.* February 18, 2020.

In addition, the resources must retain integrity. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. The resource must be at least 50 years old, except in exceptional circumstances.

According to the Cultural Resources Study, the pieces of lumber in the northwest corner of the site are likely remnants of the fence that was removed from the site in 2010. Given that the original fence was removed in 2010, the resource would not be considered to have retained the integrity, as is necessary for listing under the NRHP and CRHR. As such, the pieces of lumber are not considered eligible for listing under the NRHP and CRHR.

As noted above, agricultural equipment was also found to be located on the project site. While the project site may have been used for agricultural purposes in the past, the Cultural Resources Study indicates that the equipment was placed on the site in recent decades. Because the agricultural equipment was placed there recently, the features would not be 50 years old, as is necessary for listing under the NRHP and CRHR. Therefore, the agricultural equipment is not considered eligible for listing under the NRHP and CRHR.

Based on the above, development of the site would cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5, and a ***less-than-significant*** impact would occur.

b,c. As noted above, the Cultural Resources Study prepared for the proposed project included a record search of the CHRIS. In addition, on January 31, 2020, Tom Origer & Associates requested a search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF). The results on the CHRIS search and NAHC SLF search indicated that historical, archaeological, and other cultural resources are not known to be present in the project vicinity. In addition, the field survey and auguring that was conducted as part of the Cultural Resources Study did not indicate the presence of any archaeological resources.

According to the Cultural Resources Study, the study area has been subject to ground disturbance associated with past agricultural activities and regular disking. As a result of past disturbance, the Cultural Resources Study determined that the project site has a low potential for buried resources to occur within the project site. Nonetheless, unknown archaeological resources, including human remains, have the potential to be uncovered during ground-disturbing construction and excavation activities at the subject property. If previously unknown resources are encountered during construction activities, the proposed project could cause a substantial adverse change in the significance of a unique archaeological resource pursuant to CEQA Guidelines Section 15064.5 and/or disturb human remains, including those interred outside of dedicated cemeteries. Therefore, impacts could be considered ***potentially significant***.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above potential impact to a *less-than-significant* level.

V-1. *Prior to grading permit issuance, the developer shall submit plans to the Planning Division for review and approval which indicate (via notation on the improvement plans) that if historic and/or cultural resources are*

encountered during site grading or other site work, all such work shall be halted immediately within 100 feet and the developer shall immediately notify the Planning Division of the discovery. In such case, the developer shall be required, at their own expense, to retain the services of a qualified archaeologist meeting the Secretary of the Interior's Professional Qualification Standards for prehistoric and historic archaeologist for the purpose of recording, protecting, or curating the discovery as appropriate. The archaeologist shall be required to submit to the Planning Division for review and approval a report of the findings and method of curation or protection of the resources. Further grading or site work within the area of discovery shall not be allowed until the preceding work has occurred.

V-2. *If human remains, or remains that are potentially human, are found during construction, a professional archeologist shall ensure reasonable protection measures are taken to protect the discovery from disturbance. The archaeologist shall notify the Sacramento County Coroner (per §7050.5 of the State Health and Safety Code). The provisions of §7050.5 of the California Health and Safety Code, §5097.98 of the California Public Resources Code, and Assembly Bill 2641 will be implemented. If the Coroner determines the remains are Native American and not the result of a crime scene, then the Coroner will notify the Native American Heritage Commission (NAHC), which then will designate a Native American Most Likely Descendant (MLD) for the project (§5097.98 of the Public Resources Code). The designated MLD will have 48 hours from the time access to the property is granted to make recommendations concerning treatment of the remains. If the applicant does not agree with the recommendations of the MLD, the NAHC can mediate (§5097.94 of the Public Resources Code). If an agreement is not reached, the qualified archaeologist or most likely descendent must rebury the remains where they will not be further disturbed (§5097.98 of the Public Resources Code). This will also include either recording the site with the NAHC or the appropriate Information Center, using an open space or conservation zoning designation or easement, or recording a reinternment document with the county in which the property is located (AB 2641). Work cannot resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the treatment measures have been completed to their satisfaction.*

VI. ENERGY. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Result in 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?	☐	☐	✖	☐

Discussion

a,b. The main forms of available energy supply are electricity, natural gas, and oil. A description of the 2019 California Green Building Standards Code (CAL Green Code) and the Building Energy Efficiency Standards, with which the proposed project would be required to comply, as well as discussions regarding the proposed project's potential effects related to energy demand during construction and operations are provided below.

California Green Building Standards Code

The 2019 CAL Green Code is a portion of the California Building Standards Code (CBSC), otherwise known as the CAL Green Code (CCR Title 24, Part 11), which became effective on January 1, 2020.[8] The purpose of the CAL Green Code is to improve public health, safety, and general welfare by enhancing the design and construction of buildings through the use of building concepts having a reduced negative impact or positive environmental impact and encouraging sustainable construction practices. The CAL Green standards regulate the method of use, properties, performance, types of materials used in construction, alteration repair, improvement and rehabilitation of a structure or improvement to property. The provisions of the code apply to the planning, design, operation, construction, use, and occupancy of every newly constructed building or structure throughout California. Requirements of the CAL Green Code include, but are not limited to, the following measures:

- Compliance with relevant regulations related to future installation of Electric Vehicle charging infrastructure in residential and non-residential structures;
- Indoor water use consumption is reduced through the establishment of maximum fixture water use rates;
- Outdoor landscaping must comply with the California Department of Water Resources' Model Water Efficient Landscape Ordinance (MWELO), or a local ordinance, whichever is more stringent, to reduce outdoor water use;
- Diversion of 65 percent of construction and demolition waste from landfills; and
- Mandatory use of low-pollutant emitting interior finish materials such as paints, carpet, vinyl flooring, and particle board.
- For some single-family and low-rise residential development developed after January 1, 2020, mandatory on-site solar energy systems capable of producing 100 percent of the electricity demand created by the residence(s). Certain residential developments, including those developments that are subject to substantial shading, rendering the use of on-site solar photovoltaic systems infeasible, are exempted from the foregoing requirement.

[8] California Building Standards Commission. *California Green Building Standards Code*. 2019.

Building Energy Efficiency Standards

The 2019 Building Energy Efficiency Standards is a portion of the CBSC, which expands upon energy efficiency measures from the 2016 Building Energy Efficiency Standards resulting in a seven percent reduction in energy consumption from the 2016 standards for residential structures. Energy reductions relative to previous Building Energy Efficiency Standards are achieved through various regulations including requirements for the use of high efficacy lighting, improved water heating system efficiency, and high-performance attics and walls. In addition, rooftop solar electricity generation would also be required for the proposed project. Rooftop solar electricity generation would ensure residences that are built under the 2019 standard further reduce energy consumption and result in about 53 percent less energy use than those residences built under the 2016 Building Energy Efficiency Standards.

Construction Energy Use

Construction of the proposed project would involve on-site energy demand and consumption related to use of oil in the form of gasoline and diesel fuel for construction worker vehicle trips, hauling and materials delivery truck trips, and operation of off-road construction equipment. In addition, diesel-fueled portable generators may be necessary to provide additional electricity demands for temporary on-site lighting, welding, and for supplying energy to areas of the site where energy supply cannot be met via a hookup to the existing electricity grid. Project construction is not anticipated to involve the use of natural gas appliances or equipment.

Even during the most intense period of construction, due to the different types of construction activities (e.g., site preparation, grading, building construction), only portions of the project site would be disturbed at a time, with operation of construction equipment occurring at different locations on the project site, rather than a single location. In addition, all construction equipment and operation thereof would be regulated per the CARB In-Use Off-Road Diesel Vehicle Regulation. The In-Use Off-Road Diesel Vehicle Regulation is intended to reduce emissions from in-use, off-road, heavy-duty diesel vehicles in California by imposing limits on idling, requiring all vehicles to be reported to CARB, restricting the addition of older vehicles into fleets, and requiring fleets to reduce emissions by retiring, replacing, or repowering older engines, or installing exhaust retrofits. In addition, as a means of reducing emissions, construction vehicles are required to become cleaner through the use of renewable energy resources. The In-Use Off-Road Diesel Vehicle Regulation would therefore help to improve fuel efficiency for equipment used in construction of the proposed project. Technological innovations and more stringent standards are being researched, such as multi-function equipment, hybrid equipment, or other design changes, which could help to further reduce demand on oil and limit emissions associated with construction.

The CARB prepared the 2017 Climate Change Scoping Plan Update (2017 Scoping Plan),[9] which builds upon previous efforts to reduce GHG emissions and is designed to continue to shift the California economy away from dependence on fossil fuels. Appendix B of the 2017 Scoping Plan includes examples of local actions (municipal code changes, zoning changes, policy directions, and mitigation measures) that would support the State's climate goals. The examples provided include, but are not limited to, enforcing idling time restrictions for construction vehicles, utilizing existing grid power for electric energy rather

[9] California Air Resources Board. *The 2017 Climate Change Scoping Plan Update.* January 20, 2017.

than operating temporary gasoline/diesel-powered generators, and increasing use of electric and renewable fuel-powered construction equipment. The regulation described above, with which the proposed project must comply, would be consistent with the intention of the 2017 Scoping Plan and the recommended actions included in Appendix B of the 2017 Scoping Plan.

Based on the above, the temporary increase in energy use occurring during construction of the proposed project would not result in a significant increase in peak or base demands or require additional capacity from local or regional energy supplies. In addition, the proposed project would be required to comply with all applicable regulations related to energy conservation and fuel efficiency, which would help to reduce the temporary increase in demand.

Operational Energy Use

Following implementation of the proposed project, PG&E would provide electricity and natural gas to the project site. Energy use associated with operation of the proposed project would be typical of residential uses, requiring electricity and natural gas for interior and exterior building lighting, heating, ventilation, and air conditioning (HVAC), electronic equipment, machinery, refrigeration, appliances, security systems, and more. Maintenance activities during operations, such as landscape maintenance, would involve the use of electric or gas-powered equipment. In addition to on-site energy use, the proposed project would result in transportation energy use associated with vehicle trips generated by the proposed residential development.

The proposed project would be subject to all relevant provisions of the most recent update of the CBSC, including the CAL Green Code and the Building Energy Efficiency Standards. Adherence to the most recent CAL Green Code and the Building Energy Efficiency Standards would ensure that the proposed structures would consume energy efficiently through the incorporation of such features as efficient water heating systems, high performance attics and walls, and high efficacy lighting. In addition, California has set energy-use reduction goals targeting zero-net-energy use in all new homes by 2020. The CALGreen Code requires that new buildings use a combination of energy efficiency and distributed renewable energy generation to meet all annual energy needs. As such, the proposed residences would be constructed to rely on 100 percent renewable energy resources. Required compliance with the CBSC would ensure that the building energy use associated with the proposed project would not be wasteful, inefficient, or unnecessary.

With regard to transportation energy use, the proposed project would comply with all applicable regulations associated with vehicle efficiency and fuel economy. In addition, as discussed in Section XVII, Transportation, of this IS/MND, the project site is located in an urban area with access to several public transit lines. Transit would provide access to several grocery stores, restaurants, banks, and schools within close proximity to the project site. The site's access to public transit and proximity to such uses would reduce VMT and, consequently, fuel consumption associated with the proposed project, thereby providing for increased pedestrian connectivity with the surrounding area and resulting in reduced vehicle use.

Strategic Energy Plan (SEP)

The City of Oakley adopted a Strategic Energy Plan (SEP) in fall of 2015.[10] The City's SEP was prepared to help meet State mandates for required energy use and GHG emission reductions. The proposed project would be consistent with the goals of the SEP, as the proposed project would comply with the latest CBSC standards regarding energy conservation, renewable energy resources, and green building standards.

Conclusion

Based on the above, construction and operations of the proposed residences, the proposed project would not result in wasteful, inefficient, or unnecessary consumption of energy resources or conflict with or obstruct a state or local plan for renewable energy or energy efficiency. Thus, a ***less-than-significant*** impact would occur.

[10] City of Oakley. *Strategic Energy Plan*. Fall 2015.

VII. GEOLOGY AND SOILS. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
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 18-1B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	✖	☐
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	✖
f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	✖	☐	☐

Discussion

ai-ii. A Geotechnical Engineering Study was prepared for the proposed project by Geo-Engineering Solutions, Inc (see Appendix C).[11] According to the *Geotechnical Engineering Study*, major faults located in the project area include the Concord-Green Valley Fault located approximately 10 miles to the west, the Hayward Fault located about 28 miles to the west, the Calaveras Fault located about 20 miles to the southwest, and the San Andreas Fault located about 47 miles to the west. However, active fault traces do not exist in the project vicinity. Given that known surface expressions of fault traces do not exist within the project vicinity, including the site, fault rupture hazard is not a significant geologic hazard at the site. In addition, Alquist-Priolo Earthquake Fault Zones are not known to exist near the project site.

According to the *Geotechnical Engineering Study*, an earthquake of moderate to high magnitude generated by the above faults could cause seismic ground shaking at the

[11] Geo-Engineering Solutions, Inc. *Geotechnical Engineering Study.* August 27, 2018.

project site. However, proper engineering of the proposed buildings in compliance with the existing standards of the CBSC would ensure that the proposed project would not be subject to substantial risks related to seismic ground shaking. Projects designed in accordance with the CBSC should be able to: 1) resist minor earthquakes without damage, 2) resist moderate earthquakes without structural damage but with some nonstructural damage, and 3) resist major earthquakes without collapse but with some structural as well as nonstructural damage. Conformance with the design standards is enforced through building plan review and approval by the City. Based on the above, a ***less-than-significant*** impact would occur related to seismic surface rupture and strong seismic ground shaking.

aiii,aiv,
c. The proposed project's potential effects related to liquefaction, landslides, lateral spreading, and subsidence/settlement are discussed in detail below.

Liquefaction and Settlement

Liquefaction is the temporary transformation of loose, saturated granular sediments from a solid state to a liquefied state as a result of seismic ground shaking. In the process, the soil undergoes transient loss of strength, which commonly causes ground displacement or ground failure to occur. Because saturated soils are a necessary condition for liquefaction, soil layers in areas where the groundwater table is near the surface have higher liquefaction potential than those in which the water table is located at greater depths. Additionally, loose unsaturated sandy soils have the potential to settle during strong seismic shaking. Liquefaction can often result in subsidence or settlement.

The *Geotechnical Engineering Study* included an evaluation of the potential for soil liquefaction and settlement to occur during a seismic event. The study used a LiqSVs1.0 – SPT & Vs Liquefaction Analysis Software (Geologismiki) to perform liquefaction and dynamic compaction analysis. The estimated liquefaction and dynamic compaction induced vertical settlement during a design earthquake event. Based on the evaluation, differential settlement caused by a seismic event is estimated to range from ¾-inch to an inch. While the estimated amount of settlement is relatively low, due to the seismicity of the area, the possibility still exists for liquefaction and settlement to occur. Therefore, without implementation of relevant design standards, the proposed project could expose people or structures to potential risk of loss, injury, or death involving liquefaction and settlement.

Landslides

Seismically-induced landslides are triggered by earthquake ground shaking. The risk of landslide hazard is greatest in areas with steep, unstable slopes. The project site is relatively flat and is not located near any slopes. Therefore, landslides would not represent a likely hazard at the site.

Lateral Spreading

Lateral spreading is horizontal/lateral ground movement of relatively flat-lying soil deposits towards a free face such as an excavation, channel, or open body of water; typically, lateral spreading is associated with liquefaction of one or more subsurface layers near the bottom of the exposed slope. Given that the project site does not contain any free faces, lateral spreading would not present a likely hazard at the site.

Conclusion

Based on the above, the proposed project would not be subject to substantial risks related to landslides or lateral spreading. However, the potential exists for liquefaction or settlement to occur at the project site. Without implementation of the necessary minimization measures, the proposed project could cause substantial adverse effects related to such. Thus, a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above impact to a *less-than-significant* level.

VII-1. *All grading and foundation plans for the development shall be designed by a Civil and Structural Engineer and reviewed and approved by the Director of Public Works/City Engineer, Chief Building Official, and a qualified Geotechnical Engineer prior to issuance of grading and building permits to ensure that all geotechnical recommendations specified in the geotechnical report prepared for the proposed project by Geo-Engineering Solutions, Inc. are properly incorporated and utilized in the project design.*

b. The proposed project would include grading of the project site prior to construction of the proposed residences. During construction activities, topsoil would be moved and graded, leading to disturbed soils. Such disturbed soils could suffer from wind and water erosion while the topsoil is exposed. Following development of the site, all exposed soils would be covered with impervious surfaces or landscaping, and, thus, long-term erosion would not occur.

Per the City of Oakley Municipal Code Sections 6.9.308 and 6.11.212, preparation of an Erosion Control Plan and Stormwater Pollution Prevention Plan (SWPPP) prior to construction activities and implementation of Best Management Practices (BMPs) during construction is required. The erosion control measures required by both the SWPPP and the Erosion Control Plan would ensure that the proposed project would not result in substantial soil erosion or the loss of topsoil. Therefore, the proposed project would not result in substantial soil erosion or the loss of topsoil, and, thus, a ***less than significant*** would occur.

d. Expansive soils can undergo significant volume changes with changes in moisture content. Specifically, such soils shrink and harden when dried and expand and soften when wetted. If structures are underlain by expansive soils, foundation systems must be capable of withstanding the potential damaging movements of the soil. Per the Geotechnical Engineering Study prepared for the proposed project, expansive soils were not encountered at the site. Because the project site is not located on expansive soil, as defined in Table 18-1B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property, a ***less-than-significant*** impact would occur.

e. The proposed project would connect to existing City sewer services. Thus, the construction or operation of septic tanks or other alternative wastewater disposal systems is not included as part of the project. Therefore, ***no impact*** regarding the capability of soil to adequately support the use of septic tanks or alternative wastewater disposal systems would occur.

f. The City's General Plan does not note the existence of any unique geologic features within the City. Consequently, implementation of the proposed project would not be anticipated to have the potential to result in direct or indirect destruction of unique geologic features. The City's General Plan indicates that few paleontological resources are known to occur within the City Planning Area.

In addition, the majority of the surrounding area is developed and paleontological resources have not been encountered in the vicinity. Thus, existing paleontological resources are not expected to occur on the site. Nonetheless, the potential exists for previously unknown paleontological resources could exist within the project site. Ground-disturbing activity such as grading, trenching, or excavating associated with implementation of the proposed project would have the potential to disturb or destroy such resources if present. Therefore, the proposed project could result in the direct or indirect destruction of a unique paleontological resource, and a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above impact to a *less-than-significant* level.

VII-2. Implement Mitigation Measures V-1 and V-2.

VIII. GREENHOUSE GAS EMISSIONS. *Would the project:*	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
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 gasses?	☐	☐	✖	☐

Discussion

a,b. Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors. Therefore, the cumulative global emissions of GHGs contributing to global climate change can be attributed to every nation, region, and city, and virtually every individual on Earth. An individual project's GHG emissions are at a micro-scale level relative to global emissions and effects to global climate change; however, an individual project could result in a cumulatively considerable incremental contribution to a significant cumulative macro-scale impact. As such, impacts related to emissions of GHG are inherently considered cumulative impacts.

Implementation of the proposed project would cumulatively contribute to increases of GHG emissions. Estimated GHG emissions attributable to future development would be primarily associated with increases of carbon dioxide (CO_2) and, to a lesser extent, other GHG pollutants, such as methane (CH_4) and nitrous oxide (N_2O) associated with area sources, mobile sources or vehicles, utilities (electricity and natural gas), water usage, wastewater generation, and the generation of solid waste. The primary source of GHG emissions for the project would be mobile source emissions. The common unit of measurement for GHG is expressed in terms of annual metric tons of CO_2 equivalents ($MTCO_2e$/yr).

The proposed project is located within the jurisdictional boundaries of BAAQMD. BAAQMD's approach to developing a threshold of significance for GHG emissions is to identify the emissions level for which a project would not be expected to substantially conflict with existing California legislation adopted to reduce statewide GHG emissions needed to move towards climate stabilization. If a project would generate GHG emissions above the threshold level, the project would be considered to generate significant GHG emissions and conflict with applicable GHG regulations. The BAAQMD threshold of significance for project-level operational GHG emissions is 1,100 $MTCO_2e$/yr.

A series of recent court cases have called into question the BAAQMD's thresholds of significance for GHG emissions. However, because the BAAQMD's thresholds of significance are supported by substantial evidence and remain the best available option, the City, as lead agency, has chosen to use the BAAQMD's thresholds of significance for evaluation of the proposed project. In recognition of the current uncertainty regarding BAAQMD's thresholds for GHG emissions, the project's consistency with applicable plans and policies for GHG emissions reductions is provided below in addition to an analysis of project-related emissions.

Neither BAAQMD nor the City has adopted thresholds of significance for construction-related GHG emissions. Nevertheless, GHG emissions resulting from construction and operations of the proposed project were modeled using the CalEEMod emissions model under the same assumptions as discussed in Section III, Air Quality, of this IS/MND. In order to evaluate the project's consistency with California's goals, the CO_2 intensity factor within CalEEMod was adjusted to reflect PG&E's progress towards achieving the State's Renewable Portfolio Standard (RPS) goals for the operational year of 2022. In addition, CalEEMod assumed the use of 100 percent renewable energy resources, as required by the 2019 CALGreen Code. All modeling outputs are included in Appendix A to this IS/MND.

According to the CalEEMod results, the proposed project would result in unmitigated operational GHG emissions of 243.63 $MTCO_2e$/yr, which is below the 1,100 $MTCO_2e$/yr threshold of significance. Construction GHG emissions are a one-time release and are, therefore, not typically expected to generate a significant contribution to global climate change. Construction would occur over approximately two years and result in total GHG emissions of 217.14 $MTCO_2e$. If the total construction emissions are added to the annual operational emissions, the project's total GHG emissions would equal 460.77 $MTCO_2e$/yr, which remains below BAAQMD's threshold of significance for operational emissions. Accordingly, neither construction nor operations of the proposed project would be anticipated to result in significant emissions of GHGs.

Consistency with Greenhouse Gas Reduction Plans

As discussed in Section VI. Energy, of this IS/MND, the City of Oakley adopted a SEP to help the City meet State mandates for required energy use and GHG emission reductions. The proposed project would be consistent with the goals of the SEP as the proposed project would comply with the latest CBSC standards regarding energy conservation and green building standards.

Absent any other local or regional Climate Action Plan, the proposed project was analyzed for consistency with the goals of AB 32, the AB 32 Scoping Plan, Executive Order B-30-15, SB 32, and AB 197.

AB 32 is aimed at reducing GHG emissions to 1990 levels by 2020. AB 32 requires CARB to prepare a Scoping Plan that outlines the main State strategies for meeting the 2020 deadline and to reduce GHGs that contribute to global climate change. The AB 32 Scoping Plan has a range of GHG reduction actions, which include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market-based mechanisms such as a cap-and-trade system, and an AB 32 implementation fee to fund the program.

Executive Order B-30-15 added the immediate target of reducing GHG emissions to 40 percent below 1990 levels by 2030. CARB released a second update to the Scoping Plan, the 2017 Scoping Plan,[12] to reflect the 2030 target set by Executive Order B-30-15 and codified by SB 32. SB 32 affirms the importance of addressing climate change by codifying into statute the GHG emissions reductions target of at least 40 percent below 1990 levels by 2030 contained in Executive Order B- 30-15. SB 32 builds on AB 32 and keeps the State on the path toward achieving the year 2050 objective of reducing emissions to 80 percent below 1990 levels. The companion bill to SB 32, AB 197, provides additional

[12] California Air Resources Board. *California's 2017 Climate Change Scoping Plan*. January 20, 2017.

direction to the CARB related to the adoption of strategies to reduce GHG emissions. Additional direction in AB 197 intended to provide easier public access to air emissions data that are collected by CARB was posted in December 2016.

As identified above, the AB 32 Scoping Plan contains GHG reduction measures that work towards reducing GHG emissions, consistent with the targets set by AB 32, Executive Order B-30-15 and codified by SB 32 and AB 197. The measures applicable to the proposed project include energy efficiency measures, water conservation and efficiency measures, and transportation and motor vehicle measures, as discussed below.

Energy efficiency measures are intended to maximize energy efficiency building and appliance standards, pursue additional efficiency efforts including new technologies and new policy and implementation mechanisms, and pursue comparable investment in energy efficiency from all retail providers of electricity in California. In addition, such measures are designed to expand the use of green building practices to reduce the carbon footprint of California's new and existing inventory of buildings. As identified above, the proposed project would comply with the latest CBSC requirements, including the requirements related to energy conservation, green building standards, and 100 percent renewable energy resources. Therefore, the proposed project would comply with applicable energy efficiency measures.

Water conservation and efficiency measures are intended to contribute to efficiency programs and use cleaner energy sources to move and treat water. Increasing the efficiency of water transport and reducing water use would reduce GHG emissions. As noted above, the project would be required to comply with the latest CBSC, which includes a variety of measures related to water use efficiency, including reduction of water use and reduction of wastewater production. In addition, the proposed project would be required to comply with Title 4, Chapter 31, Water-Efficient Landscape Requirements, of the City's Municipal Code. Therefore, the proposed project would not conflict with any of the water conservation and efficiency measures.

The goal of transportation and motor vehicle measures is to develop regional GHG emissions reduction targets for passenger vehicles. Specific regional emission targets for transportation emissions would not directly apply to the proposed project. However, as a requirement of the CBSC, the proposed residences would be constructed with Electric Vehicle Charging (EVC) equipment. By including EVC equipment, residents would be encouraged to use electric vehicles, thereby reducing mobile-source emissions. Moreover, the proposed project is a residential project. By virtue of the location of the project site, future residents would be located in close proximity to commercial uses and transit stops, which would allow residents to walk or use alternative modes of transportation to access commercial uses. By encouraging walking and alternative modes of transportation in the project vicinity, the proposed project would reduce the use of passenger vehicles. Therefore, the proposed project would not conflict with the identified transportation and motor vehicle measures.

Considering the above, the proposed project would comply with existing State regulations adopted to achieve the overall GHG emissions reduction goals identified in AB 32, the AB 32 Scoping Plan, Executive Order B-30-15, SB 32, and AB 197 and would be consistent with applicable state plans and programs designed to reduce GHG emissions.

Conclusion

Based on the above, the proposed project would not be considered to generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, or conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs; and impacts would be considered ***less than significant***.

IX. HAZARDS AND HAZARDOUS MATERIALS. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
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 likely 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 the risk of loss, injury or death involving wildland fires?	☐	☐	✖	☐

Discussion

a. A significant hazard to the public or the environment could result from the routine transport, use, or disposal of hazardous materials. Future operations on the project site could involve the use of common household cleaning products, fertilizers, and herbicides on-site, any of which could contain potentially hazardous chemicals; however, such products would be expected to be used in accordance with label instructions. Due to the regulations governing use of such products and the amount that could reasonably be used on the site, routine use of such products would not represent a substantial risk to public health or the environment. Therefore, the proposed project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, and a ***less-than-significant*** impact would occur.

b. The following discussion provides an analysis of potential hazards related to the proposed construction activities and existing on-site conditions.

Construction Activities

Construction activities associated with the proposed project would involve the use of heavy equipment, which would contain fuels and oils, and the use of other products such

as concrete, paints, and adhesives. Small quantities of potentially toxic substances (e.g., petroleum and other chemicals used to operate and maintain construction equipment) would be used at the project site and transported to and from the site during construction. However, the project contractor would be required to comply with all California Health and Safety Codes and local City ordinances regulating the handling, storage, and transportation of hazardous and toxic materials. Thus, construction of the proposed project would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment.

Existing On-Site Conditions

As discussed previously, the project site consists of undeveloped, vacant land that appears to be regularly disked. Although not documented at the project site, past agricultural activities within the project site may have included the use of pesticides, fertilizers, or other chemicals. Agricultural uses could result in concentrations of residual chemicals being present in the near surface soil if use or storage of pesticides, fertilizers, or other chemicals has occurred. However, upon development of the project, the site would primarily be covered by pavement and other impervious surfaces, thereby limiting future upset of on-site soils. Nonetheless, issues related to contaminated soils could pose a risk to construction workers during ground disturbing activities. Therefore, analysis of on-site soils would be required in order to ensure that any existing soil contaminant concentrations are below the direct exposure Environmental Screening Levels (ESLs) for residential developments, which measures potential hazards to human health. Depending on the types of soil contaminants present, the primary source for ESLs is the California Department of Toxic Substances Control's (DTSC's) residential screening levels, which are recommended in the DTSC's Office of Human and Ecological Risk guidance document *Human Health Risk Assessment Note 3*. For parameters and compounds where DTSC residential screening levels are not established, any detected compounds may instead be compared to Regional Screening Levels (RSLs) established by the U.S. Environmental Protection Agency (USEPA) Region 9.

Conclusion

Based on the above, historical agricultural activities on-site may have included pesticide use, thereby contaminating soils within the subject property. Therefore, the proposed project could create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment and a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above potential impact to a *less-than-significant* level.

IX-1. *Prior to initiation of future demolition or construction activities on the proposed project site, the project applicant shall complete an analysis of on-site soils to determine whether substantial concentrations of organochloride pesticides or other soil contaminants are present above the applicable direct exposure Environmental Screening Levels (ESLs) set by the Regional Water Quality Control Board, the residential screening levels set by the Department of Toxic Substances Control's Human Health Risk*

Assessment Note 3, and/or the U.S. Environmental Protection Agency's Regional Screening Levels for Region 9. If contaminants are not detected above applicable ESLs/RSLs, then further mitigation is not required. If contaminants are detected above the applicable ESLs/RSLs, then the soils shall be remediated by off-hauling to a licensed landfill facility. Such remediation activities shall be performed by a licensed hazardous waste contractor (Class A) and contractor personnel that have completed 40-hour OSHA hazardous training. The results of soil sampling and analysis, as well as verification of proper remediation and disposal, shall be submitted to the Planning Division for review and approval.

c. The nearest school relative to the project site is Orchard Park Elementary School, which is located approximately 30 feet to the north of the site. As discussed under question 'b' above, construction of the proposed project could include the use of small quantities of potentially toxic substances (e.g., petroleum and other chemicals used to operate and maintain construction equipment); however, the project contractor would be required to comply with all State and local City ordinances regulating the use of such products. In addition, residential developments do not typically include the use of or emission of hazardous materials. Therefore, the proposed project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school, and a ***less-than-significant*** impact would occur.

d. According to the Department of Toxic Substance Control's Hazardous Waste and Substances Site List, the project site is not located on or near a site that is included a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5.[13] Therefore, the proposed project would have ***no impact*** with respect to being located on a hazardous materials site.

e. The nearest airport to the project site is the Byron Airport located approximately 12.65 miles southeast of the project site. Therefore, the project site is not located within two miles of any public airports and does not fall within an airport land use plan area. Accordingly, ***no impact*** would occur related to a safety hazard or excessive noise for people residing or working in the project area.

f. During operation, the proposed project would provide adequate access for emergency vehicles and would not interfere with potential evacuation or response routes used by emergency response teams. During construction of the proposed project, all construction equipment would be staged on-site so as to prevent obstruction of local and regional travel routes in the City that could be used as evacuation routes during emergency events. In addition, the proposed project would not substantially alter the existing circulation system in the surrounding area. As noted in Section XVII, Transportation, of this IS/MND, the proposed project would provide adequate sight distance at the proposed access points at Oakley Road and would generate minimal traffic. As a result, the proposed project would have a ***less-than-significant*** impact with respect to impairing the implementation of or physically interfering with an adopted emergency response plan or emergency evacuation plan.

[13] Department of Toxic Substances Control. *EnviroStor.* Available at: https://www.envirostor.dtsc.ca.gov/public/. Accessed February 2020.

g. According to the California Department of Forestry and Fire Protection (CAL FIRE) Fire and Resource Assessment Program, the project site is not located within a Very High or High Fire Hazard Severity Zone (FHSZ).[14] In addition, the site is located in an urbanized area of the City and is predominantly surrounded by existing development. Therefore, the proposed project would not expose people or structures to the risk of loss, injury or death involving wildland fires, and a ***less-than-significant*** impact would occur.

[14] California Department of Forestry and Fire Protection. *Contra Costa County, Very High Fire Hazard Severity Zones in LRA*. November 7, 2007.

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

Discussion

a, ci-ciii. The following discussion provides a summary of the proposed project's potential to violate water quality standards/waste discharge requirement, alter the drainage pattern of the site resulting in erosion or siltation, increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site, contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems, or otherwise degrade water quality during construction and operation.

Construction

During the early stages of construction activities, topsoil would be exposed due to grading and excavation of the site. After grading and prior to overlaying the ground with impervious surfaces and structures, the potential exists for wind and water to discharge sediment and/or urban pollutants into stormwater runoff, which could adversely affect water quality.

The State Water Resources Control Board (SWRCB) regulates stormwater discharges associated with construction activities where clearing, grading, or excavation results in land disturbance of one or more acres. The City's National Pollutant Discharge Elimination System (NPDES) permit requires applicants to show proof of coverage under the State's

General Construction Permit prior to receipt of any construction permits. The State's General Construction Permit requires a SWPPP to be prepared for the site. A SWPPP describes Best Management Practices (BMPs) to control or minimize pollutants from entering stormwater and must address both grading/erosion impacts and non-point source pollution impacts of the development project. Because the proposed project would disturb greater than one acre of land, the proposed project would be subject to the requirements of the State's General Construction Permit and, with implementation of the required SWPPP and BMPs included therein, the proposed project would not result in a violation of water quality standards and/or degradation of water quality. Furthermore, the proposed project would be required to submit an erosion and sediment control plan with submittal of the grading permit application to ensure water quality is not degraded. The plan would include erosion and sediment control measures that would be implemented during grading and would be approved by the City Engineer. Without submittal and approval of a SWPPP and erosion and sediment control plan, the proposed project could violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality.

Operation

Following completion of project buildout, the site would be largely covered with impervious surfaces and landscaping areas, and topsoil would no longer be exposed. As such, the potential for erosion and associated impacts to water quality would be reduced. However, addition of the impervious surfaces on the site would result in the generation of urban runoff during project operations, which could contain pollutants if the runoff comes into contact with vehicle fluids on parking surfaces and/or landscape fertilizers and herbicides. All municipalities within Contra Costa County (and the County itself) are required to develop more restrictive surface water control standards for new development projects as part of the renewal of the Countywide NPDES permit.

The City of Oakley has adopted the County C.3 Stormwater Standards, which require new development and redevelopment projects that create or alter 10,000 sf or more of impervious area to contain and treat all stormwater runoff from the project site. Thus, the proposed project would be subject to the requirements of the SWRCB and the Regional Water Quality Control Board (RWQCB), as well as the County C.3 Standards, which are included in the City's NPDES General Permit. In addition, the proposed project would adhere to Title 6, Chapter 11, of the Municipal Code, which establishes standards for stormwater management and discharge.[15] Prior to issuance of a building permit, the applicant would submit a Stormwater Control Plan (SWCP) that meets the criteria in the most recent version of the Contra Costa Clean Water Program Section C.3 Guidebook. Compliance with such requirements would ensure that impacts to water quality standards or waste discharge requirements would not occur during operation of the proposed project.

In compliance with the C.3 Guidebook, the proposed project would treat stormwater from the site via bio-treatment areas located along the project site frontage. The bio-treatment areas would be required to be sized in accordance and with the Contra Costa C.3 standards. The bio-treatment areas would allow water to infiltrate the soils, which would treat stormwater on-site and reduce the rate of runoff. However, a SWCP has not been prepared for the proposed project. Furthermore, pre- and post- stormwater discharge calculations would be necessary to demonstrate compliance with the C.3 Standards and the efficacy of the proposed bio-treatment areas. Therefore, the efficacy of the bio-

[15] City of Oakley. *Oakley Municipal Code* [Title 6, Chapter 11]. Updated January 14, 2020.

treatment areas cannot be determined, and, thus, compliance with the C.3 Standards cannot be assured.

Conclusion

Based on the above, the proposed project could violate water quality standards/waste discharge requirement, alter the drainage pattern of the site resulting in erosion or siltation, increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site, contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems, or otherwise degrade water quality during construction and operation. Thus, a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above impact to a *less-than-significant* level.

X-1. *Prior to issuance of grading permits, the applicant shall prepare a Storm Water Pollution Prevention Plan (SWPPP). The developer shall file the Notice of Intent (NOI) and associated fee to the SWRCB. The SWPPP shall serve as the framework for identification, assignment, and implementation of BMPs. The SWPPP shall be submitted to the Director of Public Works/City Engineer for review and approval and shall remain on the project site during all phases of construction. Following implementation of the SWPPP, the contractor shall subsequently demonstrate the SWPPP's effectiveness and provide for necessary and appropriate revisions, modifications, and improvements to reduce pollutants in stormwater discharges to the maximum extent practicable. The contractor shall implement BMPs to reduce pollutants in stormwater discharges to the maximum extent practicable.*

X-2. *In addition to a SWPPP, prior to issuance of grading permits, the project applicant shall create an interim and final erosion and sediment control plan which shall include a delineation and brief description of the measures to be undertaken to retain sediment on the site, including but not limited to, the design and specifications of bio-treatment areas and a schedule for maintenance. The plan shall also contain a delineation and brief description of the surface runoff and erosion control measures, including but not limited to, types and method of applying mulches, and designs and specifications for diverters, dikes, and drains. The plan shall be reviewed and approved by the City Public Works and Engineering Department.*

X-3. *The project applicant shall submit a complete Stormwater Control Plan and Report compliant with the requirements set forth in the City's most current NPDES permit. The C.3 treatment facilities shall be adequately sized to treat the stormwater runoff from the associated drainage management areas. The grading and/or building plans shall include drawings and specifications necessary to implement all measures in the approved Stormwater Control Plan. Design features shall incorporate low impact development design standards as outlined in the most current edition of the Contra Costa Clean Water Program's C.3 Guidebook. All plans shall be reviewed and approved by the City Public Works and Engineering Department.*

b,e. Potable water service for the proposed project would be provided by the DWD. According to the DWD's Urban Water Management Plan (UWMP), the primary water supply for distribution is surface water.[16] However, the DWD does operate a groundwater supply system that currently consists of groundwater extracted from two wells in Oakley, which is then conveyed in a dedicated well supply pipeline to a blending facility. The wells are connected to the Tracy Subbasin underlying the City.

While the proposed project would create new impervious surfaces within the site, the Tracy Subbasin is 345,000 acres in size; therefore, the groundwater basin within which the project site is located would be recharged from many sources over a large area. Additionally, the Tracy Subbasin has been designated as a medium-priority basin by the Department of Water Resources, and is not in overdraft conditions.

Therefore, any new impervious surfaces associated with the proposed project would not interfere substantially with groundwater recharge within the Tracy Subbasin. Furthermore, the bio-treatment areas would allow stormwater to infiltrate on-site soils and potentially contribute to groundwater recharge within the landscaped areas. Stormwater that does not infiltrate soils would be directed from the bio-treatment areas to the City's water system and eventually discharged into the Delta which also contributes to groundwater recharge in the region.

Based on the above, the project would not result in water quality impacts and, thus, would not conflict with or obstruct implementation of a water quality control plan. Therefore, the proposed project would result in a ***less-than-significant*** impact with respect to substantially decreasing groundwater supplies, interfering substantially with groundwater recharge, or conflicting with or obstructing implementation of a water quality control plan or sustainable groundwater management plan.

civ. According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map for the project site, the project site is located within an Area of Minimal Flood Hazard (Zone X).[17] The site is not classified as a Special Flood Hazard Area or otherwise located within a 100-year or 500-year floodplain. Therefore, development of the proposed project would not impede or redirect flood flows and ***no impact*** would result.

d. As discussed under question 'civ' above, the project site is not located within a flood hazard zone. Tsunamis are defined as sea waves created by undersea fault movement, whereas a seiche is a long-wavelength, large-scale wave action set up in a closed body of water such as a lake or reservoir. The project site is not located in proximity to a coastline and would not be potentially affected by flooding risks associated with tsunamis. A seiche is a long-wavelength, large-scale wave action set up in a closed body of water such as a lake or reservoir. Seiches do not pose a risk to the proposed project, as the project site is not located adjacent to a large closed body of water. Based on the above, the proposed project would not pose a risk related to the release of pollutants due to project inundation flooding, tsunami, or seiche, and ***no impact*** would occur.

[16] Diablo Water District. *Final 2015 Urban Water Management Plan.* June 2016.
[17] Federal Emergency Management Agency. *Flood Insurance Rate Map 06013C0355G.* Effective March 21, 2017.

XI. LAND USE AND PLANNING. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
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?	☐	☐	✖	☐

Discussion

a. A project risks dividing an established community if the project would introduce infrastructure or alter land use so as to change the land use conditions in the surrounding community, or isolate an existing land use. Currently, existing land uses in the project vicinity include single family residences to the east and west, single family residences to the south across Oakley Road, and an elementary school to the north. The proposed residences would be compatible with the existing development in the project area. Given that the proposed project would involve construction on a currently vacant site, and would not involve any features that would divide an established community, such as a large roadway or walls, the project would not further divide an established community. As such, the proposed project would not physically divide an established community and a ***less-than-significant*** impact would occur.

b. According to the City's General Plan, the project site is designated LI and zoned LI. The proposed project includes a request for a General Plan Amendment from LI to SH, as well as a Rezone from LI to R-6. Upon approval of both entitlements, the proposed project would develop 22 single-family residences at the project site. The current designations would be amended to reflect the characteristics of the proposed project. While buildout of the site was not anticipated for residential uses, general development of the site has been anticipated, and development of residential uses would not result in greater impacts as compared to development of the site with industrial uses. As such, the proposed project is within the realm of what has been anticipated for the site and potential impacts resulting from development of the project have been analyzed in the General Plan EIR.

   In addition, the proposed project would not conflict with City policies and regulations adopted for the purpose of avoiding or mitigating an environmental effect. For example, in compliance with the ECCCHCP/NCCCP, the proposed project would be subject to pay all applicable fees according to the Fee Zone Map of the ECCCHCP/NCCP prior to construction and completion of pre-construction surveys for Swainson's hawk, golden eagle, and nesting and migratory birds (Mitigation Measures IV-1 through IV-7). The developer would be required to pay the appropriate fees based on the applicable fee calculator at the time of development. Thus, the proposed project would not cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect, and thus, a ***less-than-significant*** impact would occur.

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

Discussion

a,b. The City of Oakley General Plan EIR states that the only viable mineral resource currently mined in the City of Oakley is sand. The General Plan does not identify any known mineral resources on the project site and much of the adjacent land is developed with residential uses. Because the site is located near an existing elementary school and residential development, the site would not be suitable for mining operations. Thus, proposed project would not result in the loss of availability of a known mineral resource or a locally important mineral recovery site. The proposed project would have ***no impact*** to mineral resources.

XIII. NOISE. *Would the project result in:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
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?	☐	☐	☐	✖

Discussion

a. The following sections present information regarding sensitive noise receptors in proximity to the project site and the potential for the proposed project to result in impacts during project construction and operation.

Sensitive Noise Receptors

Some land uses are considered more sensitive to noise than others, and, thus, are referred to as sensitive noise receptors. Land uses often associated with sensitive noise receptors generally include residences, schools, libraries, hospitals and passive recreational areas. Noise sensitive land uses are typically given special attention in order to achieve protection from excessive noise. In the vicinity of the project site, sensitive land uses include existing single-family residential uses located to the east and west, an elementary school to the north, and single-family residences to the south, across Oakley Road. The existing noise environment in the project vicinity is primarily defined by vehicle traffic on the local roadway network and the elementary school to the north.

Standards of Significance

The City of Oakley General Plan Noise Element establishes a noise level standard of 60 dB as normally acceptable at residential land uses. The noise level performance standards for transportation noise compatibility are shown in Table 4. Based upon the table, an ambient noise level of 65 dBA L_{dn} is considered normally acceptable for residential uses. Policy 9.1.6 in the City's General Plan considers the following significance criteria for noise impacts:

- Where existing traffic noise levels are less than 60 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a 5 dB L_{dn} increase in noise levels due to roadway improvement projects will be considered significant;
- Where existing traffic noise levels range between 60 and 65 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a 3 dB L_{dn} increase in noise levels due to roadway improvement projects will be considered significant; and
- Where existing traffic noise levels are greater than 65 dB L_{dn} at the outdoor activity areas of noise sensitive uses, a 1.5 dB L_{dn} increase in noise levels due to roadway improvement projects will be considered significant.

Table 4
Maximum Allowable Noise Exposure Transportation Noise Sources

Land Use	Outdoor Activity Areas[1] Ldn/CNEL, dB	Interior Spaces	
		Ldn/CNEL, dB	Leq, dB[2]
Residential	65	45	--
Transient Lodging	65[3]	45	--
Hospitals, Nursing Homes	65	45	--
Theaters, Auditoriums, Music Halls	--	--	35
Churches, Meeting Halls	65	--	40
Office Buildings	--	--	45
Schools, Libraries, Museums	--	--	45
Playgrounds, Neighborhood Parks	70	--	--

Notes:
1. Where the location of outdoor activity areas is unknown, the exterior noise level standards shall be applied to the property line of the receiving land use. Where it is not practical to mitigate exterior noise levels at patio or balconies of apartment complexes, a common area such as a pool or recreation area may be designated as the outdoor activity area.
2. As determined for a typical worst-case hour during periods of use.
3. In the case of hotel/motel facilities or other transient lodging, outdoor activity areas such as pool areas may not be included in the project design. In these cases, only the interior noise level criterion will apply.

Source: City of Oakley 2020 General Plan, Table 9-3.

Per the City's General Plan, with regard to non-transportation noise, exterior noise levels at residences should not exceed 55 dBA during daytime hours (7:00 AM to 10:00 PM) and 45 dBA during nighttime hours (10:00 PM to 7:00 AM).

Impact Analysis

The following sections provide an analysis of potential noise impacts associated with construction and operation of the proposed project.

Construction Noise

During construction of the proposed project, heavy-duty equipment would be used for demolition, grading, excavation, paving, and building construction, which would result in temporary noise level increases. Noise levels would vary depending on the type of equipment used, how the equipment is operated, and how well the equipment is maintained. In addition, noise exposure at any single point outside the project site would vary depending on the proximity of construction activities to that point. Standard construction equipment, such as backhoes, dozers, and dump trucks would be used on-site.

Table 5 shows the predicted construction noise levels for development of the proposed project. Based on the table, activities involved in typical construction would generate maximum noise levels up to 90 dB at a distance of 50 feet. While the nearest single-family residence to the east of the site is located within 50 feet of the proposed construction area, most construction would occur within the center of the site or in areas of the site in excess of 50 feet from nearby receptors. In addition, as structures are completed, the residences

would act as barriers to noise generating construction equipment. Furthermore, the use of the concrete saw, which is a particularly loud piece of equipment, would occur along the project site frontage, which is approximately 75 feet from the nearest residence and 515 feet from the elementary school. Therefore, because noise levels generally decrease as distance increases, the maximum noise level would be less than the 90 dB presented in the table below.

Table 5
Construction Equipment Noise

Type of Equipment	Maximum Level, dB at 50 feet
Backhoe	78
Compactor	83
Compressor (air)	78
Concrete Saw	90
Dozer	82
Dump Truck	76
Excavator	81
Generator	81
Pneumatic Tools	85

Source: Federal Highway Administration, Roadway Construction Noise Model User's Guide, January 2006.

Construction activities would be temporary in nature and are anticipated to occur during normal daytime hours. The City of Oakley establishes permissible hours of construction in Section 4.2.208 of the Municipal Code. The ordinance restricts noise-producing construction activities to weekday hours between 7:30 AM and 7:00 PM Monday through Friday, and from 9:00 AM to 7:00 PM on Saturdays and Sundays. During the permissible hours, construction activities are conditionally exempt from the Noise Ordinance Standards.

Although construction activities are temporary in nature and would likely occur during normal daytime working hours, construction-related noise could result in significant impacts to the residences in the vicinity of the project if construction activities were to occur outside the normal daytime hours. In addition, without the inclusion of noise muffling practices or other noise-mitigating practices, construction noise could result in significant impacts to the elementary school to the north of the site. Therefore, impacts resulting from the 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 during construction could be potentially significant.

Project Operational Noise

Operation of the proposed project would generate noise primarily associated with increased traffic on nearby roadways. Project operational noise sources would also be generated from heating ventilation and air conditioning (HVAC) equipment.

As discussed in Section XVII, Transportation, of this IS/MND, the proposed project would generate approximately 208 trips. Generally, a doubling in traffic volumes is required to increase traffic noise levels by 3.0 dB, which is considered to be the threshold for a significant increase per the Federal Interagency Committee on Noise (FICON). The proposed project would not double traffic volumes on local roadways and, thus, would not

substantially increase traffic noise in the project vicinity. Therefore, the proposed project would not result in a substantial increase in noise levels related to vehicle traffic.

The primary on-site stationary noise sources from operation of the proposed project would include potential noise associated with HVAC equipment. The nearest existing use that would be exposed to HVAC noise would be the existing residences approximately 17-feet to the east of the site boundary. However, because the proposed residences would be setback 15-feet from the site boundary, noise associated with the HVAC would be further reduced. Standard construction practices for residential developments typically result in an exterior to interior noise reduction of 25 dB. In combination with the setback distances, such reductions would limit noise levels associated with any HVAC equipment. Therefore, the proposed project would not result in a substantial increase in noise levels related to HVAC equipment.

It should be noted that the project site is currently designated LI per the City's General Plan and is zoned LI. Residential developments do not typically include the use of industrial equipment and do not generate noise levels that are typical of industrial developments. Because the project site would be developed with residential uses, as opposed to industrial uses, potential noise levels increases associated with implementation of the proposed project would be reduced relative to what was anticipated by the City and analyzed for the site in the General Plan EIR.

Conclusion

Based on the above, operation of the proposed project would not result in the generation of a substantial permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the City's General Plan and the Municipal Code. However, considering the potential for construction activities to result in temporary increases in noise levels in the project area in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies, a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above impact to a *less-than-significant* level.

XIII-1. *Construction activities shall comply with the Oakley Municipal Code and shall be limited to the hours set forth below:*

Monday-Friday: 7:30 AM to 7:00 PM
Saturdays, Sundays, and holidays: 9:00 AM to 7:00 PM

These criteria shall be included in the grading plan submitted by the applicant/developer for review and approval of the Public Works Department prior to issuance of grading permits. Exceptions to allow expanded construction activities shall be reviewed on a case-by-case basis as determined by the Chief Building Official and/or City Engineer.

XIII-2. *Construction activities shall adhere to the requirements of the City of Oakley with respect to hours of operation, muffling of internal combustion engines, and other factors that affect construction noise generation and its*

effects on noise-sensitive land uses. In addition, all diesel-powered equipment, pneumatic tools, and noise generating construction equipment shall be used and staged as far away as possible from the nearest sensitive receptors. Prior to issuance of grading permits, these criteria shall be included in the grading plan submitted by the applicant/developer for the review and approval of the Public Works Department.

XIII-3. *During construction, the applicant/developer shall designate a disturbance coordinator and conspicuously post this person's number around the project site and in adjacent public spaces. The disturbance coordinator shall receive all public complaints about construction noise disturbances and be responsible for determining the cause of the complaint, and implement feasible measures to be taken to alleviate the problem. The disturbance coordinator shall report all complaints and corrective measures taken to the Planning Division. Proof of posting of the disturbance coordinator's contact information shall be submitted to the Planning Division.*

b. Similar to noise, vibration involves a source, a transmission path, and a receiver. However, noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person's perception to the vibration depends on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating.

Vibration is measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration in terms of peak particle velocities (PPV) in inches per second (in/sec). Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of PPV. Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. Table 6, which was developed by the California Department of Transportation (Caltrans), shows the vibration levels that would normally be required to result in damage to structures. As shown in the table, the threshold for architectural damage to structures is 0.20 in/sec PPV and continuous vibrations of 0.10 in/sec PPV, or greater, would likely cause annoyance to sensitive receptors.

The primary vibration-generating activities associated with the proposed project would occur during construction when activities such as grading, utilities placement, and paving occur. Table 7 shows the typical vibration levels produced by construction equipment at various distances. The most substantial source of groundborne vibrations associated with project construction would be the use of vibratory compactors. Use of vibratory compactors/rollers could be required during construction of the proposed project. The proposed project would only cause elevated vibration levels during construction, as the proposed project would not involve any uses or operations that would generate substantial groundborne vibration. Although noise and vibration associated with the construction phases of the project would add to the noise and vibration environment in the immediate project vicinity, construction activities would be temporary in nature and are anticipated to occur during normal daytime working hours.

Table 6
Effects of Vibration on People and Buildings

PPV		Human Reaction	Effect on Buildings
mm/sec	in/sec		
0.15 to 0.30	0.006 to 0.019	Threshold of perception; possibility of intrusion	Vibrations unlikely to cause damage of any type
2.0	0.08	Vibrations readily perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
2.5	0.10	Level at which continuous vibrations begin to annoy people	Virtually no risk of "architectural" damage to normal buildings
5.0	0.20	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relative short periods of vibrations)	Threshold at which there is a risk of "architectural" damage to normal dwelling - houses with plastered walls and ceilings. Special types of finish such as lining of walls, flexible ceiling treatment, etc., would minimize "architectural" damage
10 to 15	0.4 to 0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause "architectural" damage and possibly minor structural damage

Source: Caltrans. Transportation Related Earthborne Vibrations. TAV-02-01-R9601. February 20, 2002.

Table 7
Vibration Levels for Various Construction Equipment

Type of Equipment	PPV at 25 feet (in/sec)	PPV at 50 feet (in/sec)
Large Bulldozer	0.089	0.031
Loaded Trucks	0.076	0.027
Small Bulldozer	0.003	0.001
Auger/drill Rigs	0.089	0.031
Jackhammer	0.035	0.012
Vibratory Hammer	0.070	0.025
Vibratory Compactor/roller	0.210 (less than 0.20 at 26 feet)	0.074

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

Based on Table 7, construction vibration levels anticipated for the project are less than the 0.2 in/sec threshold at distances of 26 feet or more. Sensitive receptors that could be impacted by construction-related vibrations, especially vibratory compactors/rollers, are located at a minimum distance of approximately 17 feet from the site boundaries. Thus, construction vibrations could exceed acceptable levels. However, the proposed project would likely not include the use of vibratory compactors/rollers near the site boundaries as such areas would be designated as the backyards for the residences. Nonetheless, should vibratory compactors be used within 25 feet of the existing structures, the proposed project could exceed acceptable vibration levels.

Based on the above, the proposed project could expose people to or generate excessive groundborne vibration or groundborne noise levels and a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above impact to a *less-than-significant* level.

XIII-3. *During construction activities associated with the proposed project, any compaction required within 26 feet of existing structures adjacent to the project site shall be accomplished by using static drum rollers rather than vibratory compactors. The above requirement shall be included via notation on any grading plans approved for the project to the satisfaction of the City of Oakley Planning Division.*

c. The nearest airport to the site is Byron Airport, located approximately 12.65 miles southeast of the site. The site is not covered by an existing airport land use plan. Given that the project site is not located within two miles of a public or private airport, the proposed project would not expose people residing or working in the project area to excessive noise levels associated with airports. Thus, ***no impact*** would occur.

XIV. POPULATION AND HOUSING. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (e.g., through projects in an undeveloped area or extension of major infrastructure)?	☐	☐	✖	☐
b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	✖

Discussion

a. The proposed project would include the development of 22 single-family residential units. Using the City of Oakley average persons per household value for single-family uses of 3.26, the proposed project's addition of 22 single-family residences would result in approximately 72 new residents.[18] The Department of Finance estimates the 2019 population of Oakley, based on the 2010 Census, to be approximately 41,759.[19] The increase in population would constitute a 0.17 percent increase in the City's population. A 0.17 percent increase in population would not be considered substantial growth. Furthermore, as discussed in Section XVII Utilities and Service Systems, of this IS/MND, adequate utility infrastructure would be available to support the proposed project. As a result, the project would have a ***less-than-significant*** impact with respect to substantial unplanned population growth in an area, either directly or indirectly.

b. The project site is currently vacant and absent of any habitable structures. As such, the proposed project would not displace a substantial number of existing housing or people, necessitating the construction of replacement housing elsewhere. Therefore, **no impact** would occur.

[18] City of Oakley. *Oakley 2020 General Plan* [pg. 2-13]. December 16, 2002.

[19] California Department of Finance. E-5 Population and Housing Estimates for Cities, Counties, and the State, 2011-2019, with 2010 Benchmark. Available at: http://www.dof.ca.gov/Forecasting/Demographics/Estimates/E-5/. Accessed February 2020.

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:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Fire protection?	☐	☐	✖	☐
b. Police protection?	☐	☐	✖	☐
c. Schools?	☐	☐	✖	☐
d. Parks?	☐	☐	✖	☐
e. Other Public Facilities?	☐	☐	✖	☐

Discussion

a. Fire protection services within the project area are provided by the East Contra Costa Fire Protection District (ECCFPD). A new fire station was built to accommodate increased demand, staffing and equipment in 2010. With the completion of the new fire station the City of Oakley General Plan anticipates fire service to be adequate for buildout of the City. The ECCFPD is a rural funded fire district that protects approximately 249 square miles and over 115,000 residents. The district provides firefighting personnel and emergency medical services with three fire stations. Station 53 is the closest station to the project site, being located approximately 1.5-miles to the east. The proposed project would be subject to the fire facilities impact fees established by the City of Oakley Municipal Code Section 9.2.502. Payment of the required impact fee would help account for any increased demands on fire services that may result from the proposed project, as well as ensure that the project conforms with the City of Oakley's General Plan Policy 4.4.2. Additionally, the proposed project does not include any alterations to the circulation system of the surrounding area, which could conflict with the City of Oakley's General Plan Policy 4.4.4, or lead to a degradation in response times.

Furthermore, although buildout of the site was not anticipated for residential uses, general development of the site with industrial uses has been anticipated. As such, the proposed project is within the realm of what has been anticipated for the site and potential impacts to fire protection services resulting from development of the project have been analyzed in the General Plan EIR.

Given the payment of fees in accordance with City of Oakley Municipal Code guidelines, the proposed project is not expected to cause significant degradation to response times or service ratios, which would induce the need for physically altered or expanded governmental facilities and the project would, therefore, result in a ***less-than-significant*** impact.

b. Police protection is currently provided to the City of Oakley by the Oakley Police Department. The Oakley Police Department currently employs 43 persons, including the Chief of Police, the Lieutenant, six Sergeants, five Detectives, 21 Police Officers, and nine Police Services Assistants.[20] As previously discussed, the proposed project would involve

[20] City of Oakley Police Department. *2017 Annual Report*. 2017. Available at http://www.ci.oakley.ca.us/wp-content/uploads/2018/04/Annual-Report-2017-2-2.pdf. Accessed February 2020.

the development of 22 single-family residences. With the development of the project site with residences, an increase in demand for police services would occur. However, development fees would be applied to the proposed project, as well as a Police Services levy. Additionally, the proposed project would include increased lighting throughout the site and along the project site frontage. An increase in street lighting could act to reduce crime in the project vicinity. The proposed project would result in a similar increase in demand as was anticipated for the site within the City's General Plan and would be subject to fees for public services.

While buildout of the site was not anticipated for residential uses, general development of the site has been anticipated, and development of residential uses would not result in greater impacts as compared to development of the site with industrial uses. As such, the proposed project would not induce the need for physically altered or expanded governmental facilities. Therefore, the proposed project would result in a ***less-than-significant*** impact.

c. The Oakley Union School District and the Antioch Unified School District provide public educational services to the City of Oakley. Given that the proposed project would include development of the project site with 22 single-family residences, the proposed project could increase the need for schools in the area. Using a standard student generation rate of 0.5 students per dwelling unit, the proposed project's addition of 22 single-family residences would result in approximately 11 new K-12 students. According to Government Code Section 65995 et. seq. and Education Code Section 17620 et. seq., payment of applicable development fees would be sufficient in reducing the impacts associated with an increase in students from the project. Therefore, the proposed project would result in a ***less-than-significant*** impact regarding an increase in demand for schools.

d,e. As previously discussed, the proposed project would result in development of 22 new single-family residences. The City of Oakley Municipal Code 9.2.208 requires five acres of parkland per 1,000 residents. Based on the rate of 3.26 persons per single-family residence, the maximum buildout of the project site would result in an increase of 72 new residents to the City. As a result, 0.36 acres of parkland would be required. Oakley resolution 19-03 requires subdividers of land within the City to dedicate land and/or pay fees in lieu of the dedication for the neighborhood and community parks and recreation programs. Because the proposed project would not include the dedication of parkland, the project applicant would be subject to the payment of in-lieu fees.

The Oakley 2020 General Plan EIR also analyzed impacts of buildout of the General Plan on other public facilities, such as libraries. Oakley has a county branch library located in Freedom High School at 1050 Neroly Road. The Oakley Branch Library is open Tuesday through Saturday. Other libraries in close proximity to the City of Oakley include the Antioch Library and the Brentwood Branch Library. The Oakley 2020 General Plan EIR concluded that with implementation of the necessary General Plan policies, impacts would be reduced to a less-than-significant levels as it relates to public services.

Considering the above, the proposed project would not include the dedication of on-site parks, and, thus, would be subject to payment of in-lieu park fees. Additionally, the proposed project would be subject to development fees to reduce impacts on other public facilities. Therefore, given that the proposed project would be required to pay the applicable park in-lieu fee and development fees, the project would result in a ***less-than-significant*** impact on parks and other public facilities.

XVI. RECREATION. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	✖	☐
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	✖	☐

Discussion

a,b. As discussed in Section XIV, Population & Housing, the proposed project would include 22 single-family residences, housing approximately 72 residents. Thus, an increase in demand on recreational facilities would occur. The City of Oakley Municipal Code, Section 9.2.208, developments that include subdivision of land to either dedicate parkland or pay in-lieu fees. Oakley resolution 19-03 requires subdividers of land within the City to dedicate land and/or pay fees in lieu of the dedication for the neighborhood and community parks and recreation programs. Therefore, given that the proposed project would be subject to the payment of the City's in-lieu fee, the project would not increase the use of any existing parks or require the construction of new recreational facilities which might have an adverse physical effect on the environment. Thus, the proposed project would result in a ***less-than-significant*** impact on recreation.

XVII. TRANSPORTATION. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
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?	☐	☐	✖	☐

Discussion

a. The following discussion is based primarily on a Traffic Impact Assessment (TIA) memo prepared for the proposed project by KD Anderson & Associates, Inc. (see Appendix D).[21] The TIA memo is a focused traffic study, which identifies the potential trip generation increase, additional traffic at adjoining intersections, and the adequacy of site access. The aforementioned issue areas are discussed in further detail below.

Project Characteristics and Trip Generations

Project vehicle trip generation rates were obtained from the Institute of Transportation Engineers (ITE) Trip Generation Manual (10th Edition). Based on the ITE rates, the proposed project is estimated to generate 208 daily vehicle trips, including 16 AM peak hour and 22 PM peak hour trips (see Table 8).

Table 8
Project Vehicle Trip Generation

Land Use (ITE Code)	Size	Daily Vehicle Trips		AM Peak Hour Vehicle Trips			PM Peak hour Vehicle Trips		
		Rate	Trips	In	Out	Total	In	Out	Total
Single-Family Residential	22 units	9.44	208	4	12	16	14	8	22

Source: KD Anderson & Associates, Inc. April 2019.

The project site plan indicates that the site has roughly 425 feet of frontage along Oakley Road. Two access intersections are proposed along the project frontage to Oakley Road. The more easterly access is 100 feet from the site's eastern boundary and is generally aligned with an access proposed for a new subdivision on the south side of the street. The second site access is 211 feet to the west of the easterly access point.

Background Traffic Information

Oakley Road is identified as an arterial roadway in the City of Oakley General Plan Circulation Diagram. Currently, Oakley Road is a two-lane rural facility in the immediate project vicinity. The long-term plan for Oakley Road is a four-lane divided street and the roadway has been widened to the standard as development has proceeded in the area to

[21] KD Anderson & Associates, Inc. *Traffic Impact Assessment for 22 Lot Subdivision Proposed at 2480 Oakley Road, Oakley, California.* April 30, 2019.

the east of the site. The raised median in Oakley Road ends about 130 feet east of the proposed eastern site access.

Traffic flow in the area of Oakley is governed by the operation of all-way stop controlled intersections on Oakley Road at Live Oak Avenue to the west of the project and at Beldin Lane/Kelsey Lane east of the site. The IS/MND prepared for the Villages at Main Street Project indicates that currently, the Live Oak Avenue/Oakley Road intersection operates at LOS C in the AM peak hour and LOS A in the PM peak hour. The segment of Oakley Road from Live Oak Avenue to Empire Avenue carries about 3,675 vehicles per day based on City count records.

Existing Plus Project Conditions

According to the TIA, the volume of traffic added to various locations on the local circulation system would depend on the level of access allowed. Initially, the median on Oakley Road would not be extended westerly. As discussed under question 'c' and 'd' below, adequate site distance from the project access point would be available to allow the median within Oakley Road to be extended. Based on the project site's location in western Oakley and recognizing the location of access to SR 160 at Main Street and to SR 4 at Laurel Road, trips to and from the project site would be split 50 percent to the east and 50 percent to the west. Figure 8 shows the resulting assignment of project trips with full access. As indicated, the proposed project would add approximately 8 to 11 trips to the intersections beyond the site in each direction. A contribution of 8 to 11 trips would be too small to have a noticeable traffic impact. Therefore, the proposed project would result in a less-than-significant impact related to causing degradations in the operation of nearby intersections.

Pedestrian, Bicycle, and Transit Facilities

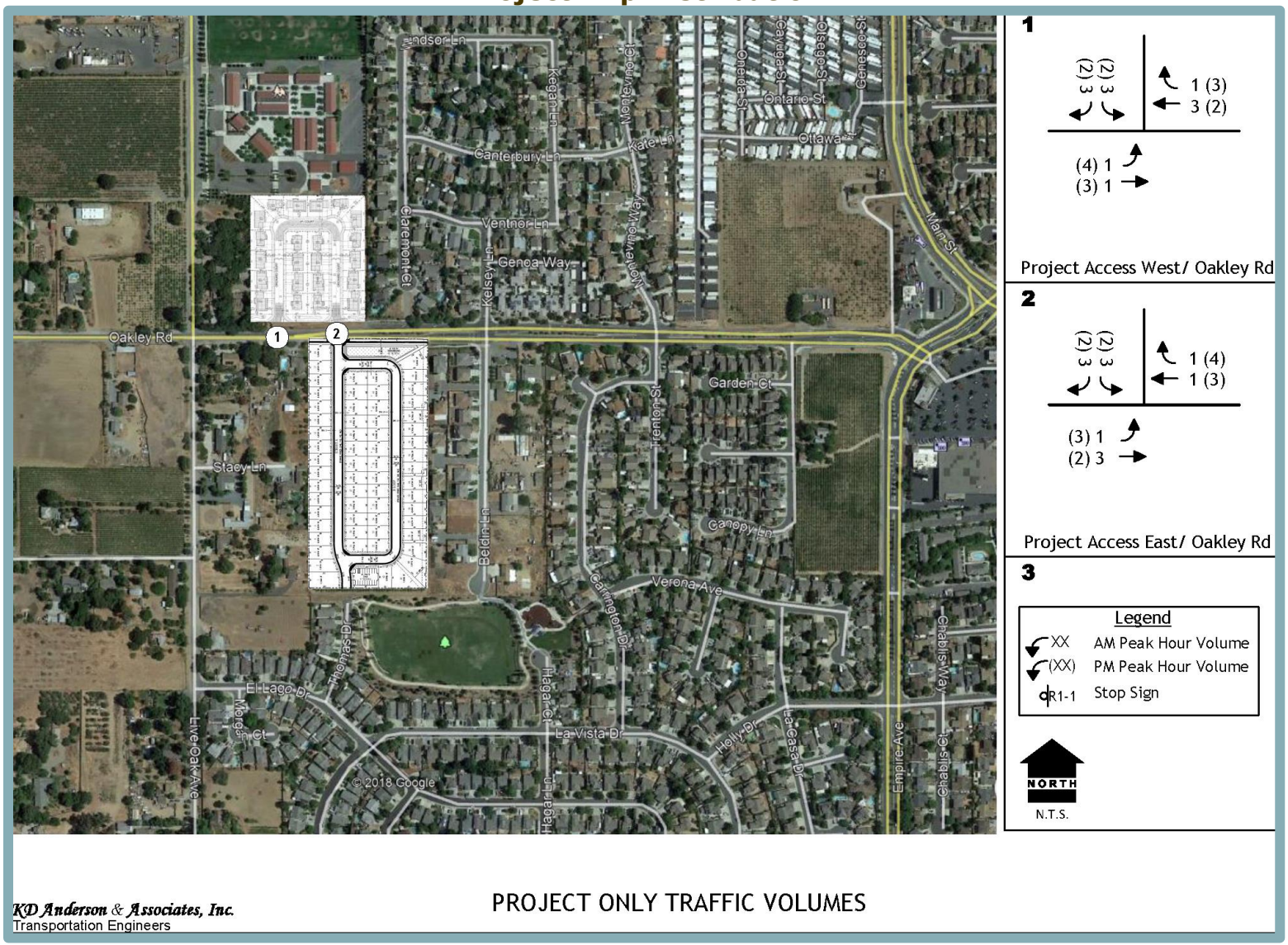
The proposed project's potential impacts related to pedestrian, bicycle, and transit facilities are discussed below.

Pedestrian Facilities

Within the vicinity of the project site, intermittent sidewalks are provided on Oakley Road and Live Oak Avenue. Further from the project site, roadways such as Main Street and Empire Avenue provide continuous sidewalks on one or both sides of the roadways. Sidewalks are not currently provided on the project frontage at Oakley Road. With implementation of the proposed project, sidewalks along the project site frontage would be constructed. New walkways and pedestrian crossings would be provided throughout the project site to provide continuous pedestrian connectivity between the proposed residences.

Considering the above, the proposed project would not result in the creation of a conflict with any adopted programs, plans, ordinances, or policies addressing pedestrian facilities and a less-than-significant impact would occur related to pedestrian facilities.

Figure 8
Project Trip Distribution



Source: KD Anderson & Associates, Inc.

Bicycle Facilities

Currently, a bike lane is provided intermittently along Oakley Road. Class II bike lanes are provided on both sides of Vintage Parkway and W. Cypress Road. A Class III Bike Route is provided on both sides of Empire Avenue, between Main Street and Laurel Road. In addition, a Class II bike lane is currently provided along the south side of Main Street in the vicinity of the project site.

The City of Oakley General Plan, City of Oakley Parks, Recreation, and Trails Master Plan, and the Contra Costa County Bicycle and Pedestrian Plan propose that several new bicycle facilities be constructed in the future. Future residents of the proposed project would have access to the existing bicycle facilities in the project area, including the bike lanes to the east along Main Street. In addition, the proposed project would include project improvements and striping that would extend the existing bike lane from the current terminus of the lane to the east of the site, along Oakley Road and through the site frontage. Thus, the project would not conflict with any existing or planned bicycle facilities.

Considering the above, the proposed project would not result in the creation of a conflict with any adopted programs, plans, ordinances, or policies addressing bicycle facilities and a less-than-significant impact would occur related to bicycle facilities.

Transit Facilities

Eastern Contra Costa Transit Authority (Tri Delta Transit) provides transit service in eastern Contra Costa County, serving the communities of Oakley, Brentwood, Antioch, Concord, Discovery Bay, Bay Point, and Pittsburg. Four routes operate in the vicinity of the project site, as follows:

- *Route 300,* the Pittsburg BART/Brentwood Park & Ride route, is a weekday express route connecting Brentwood to the Pittsburg/Bay Point BART station via Oakley and Antioch. Route 300 travels along Main Street, operating from 4:15 AM to approximately 10:00 PM with 15- to 30-minute headways.
- *Route 383,* the Oakley/Antioch/Freedom High School route, connects Oakley to Antioch and Freedom High School in Oakley. Route 383, in both clockwise and counterclockwise directions, provides only weekday service. The counterclockwise route runs with approximate one-hour headways, and the clockwise route runs twice during the AM peak hour period only.
- *Route 391,* the BART/Pittsburg/Antioch/Oakley/Brentwood route, provides weekday service to most East County cities. Route 391 operates from 4:00 AM to 1:15 AM with 30 to 60-minute headways.
- *Route 393*, the BART/Pittsburg/Antioch/Oakley/Brentwood route, provides weekend service to Route 391. Route 393 operates from 5:20 AM to 2:00 AM with approximately 60-minute headways.

Near the project site, the nearest bus stops are located at the intersection of Main Street/Empire Avenue, approximately 0.44-mile to the east of the project site, and Main Street/Live Oak Avenue, 0.5-mile north of the project site.[22] Both transit stops are within walking distance of the project site. Therefore, future residents, workers, and patrons at the project site would have access to transit services. The project would not conflict with any existing or planned transit facilities. Thus, the proposed project would not conflict with

[22] East Contra Costa Transit Authority. *Bus Stop Locations.* Available at: http://trideltatransit.com/realtimeMap.aspx. Accessed February 2020.

a program, plan, ordinance, or policy addressing transit service and a less-than-significant impact would occur.

Conclusion

Based on the above, the proposed project would not conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities. Thus, a ***less-than-significant*** impact would occur.

b. Section 15064.3 of the CEQA Guidelines provides specific considerations for evaluating a project's transportation impacts. Per Section 15064.3, analysis of vehicle miles traveled (VMT) attributable to a project is the most appropriate measure of transportation impacts. While a qualitative discussion of VMT has been provided below, the provisions of Section 15064.3 apply only prospectively; determination of impacts based on VTM is not required Statewide until July 1, 2020.

Per Section 15064.3(3), a lead agency may analyze a project's VMT qualitatively based on the availability of transit, proximity to destinations, etc. While changes to driving conditions that increase intersection delay are an important consideration for traffic operations and management, the method of analysis does not fully describe environmental effects associated with fuel consumption, emissions, and public health. Section 15064.3(3) changes the focus of transportation impact analysis in CEQA from measuring impact to drivers to measuring the impact of driving.

As noted in question 'a' above, the project site would be served by the Tri-Delta Transit system, with bus stops provided to the west and north of the project site. In addition, development of the proposed project would increase connectivity to the nearby neighborhoods and include pedestrian and bicycle infrastructure within the project site. For example, the proposed project would include construction of new sidewalks along the project site frontage, and extension of the existing bike lane within Oakley Road along the project frontage. In addition, the project site is located in close proximity to nearby schools and commercial uses, such as the existing elementary school to the north and the Oakley Town Center to the east. By providing pedestrian and bicycle connectivity between the proposed residential units and the surrounding neighborhoods, the VMT associated with the proposed project would be minimized. Therefore, the proposed project would not conflict or be inconsistent with CEQA Guidelines Section 15064.3(b), and a ***less-than-significant*** impact would occur.

c,d. Vehicles would have access to the project site by way of two entry points along Oakley Road through construction of a new looped, private access roadway. The proposed project's access and circulation has been reviewed within the context of safety and design consideration including the following elements:

- Interaction between access to other projects;
- Sight distance for posted speed limit; and
- Feasibility of multiple access intersections.

The aforementioned safety and design considerations are discussed in further detail below.

Interaction Between Access to Other Projects

The proposed project is located directly north of another subdivision that is planned to the south of Oakley Road. Off-set access points associated with developments can occasionally cause conflicts and impacts to traffic in the immediate vicinity of a project. Because access to the planned subdivision and the proposed eastern access intersection are aligned, the conflicts inherent to offset intersections are addressed as part of the proposed project. However, the planned southern access and the proposed western access within the site would be offset by 211 feet. Because the number of lots served by the proposed on-site access points is low, the total number of vehicles using the western access would be low. Therefore, the offset distance between the access points should be adequate on an interim basis until the raised median on Oakley Road is extended westerly and limits both sides to right-turn only. As such, the proposed project would not increase hazards due to a geometric design feature or incompatible uses, or result in inadequate emergency access.

Sight Distance

Caltrans' minimum stopping sight distance requirements are presented in Table 201.1 of the Highway Design Manual (HDM).[23] The minimum sight distance at 35 mph is 250 feet. The extent to which that sight distance will be available from the location mandated in the HDM (i.e., 15 feet from the edge of travel lane) has been assessed at each driveway. The location has been determined assuming that the proposed project would widen its half of Oakley Road to the 4-lane width. The widening of Oakley Road has been anticipated by the City in the Oakley General Plan and previously analyzed in the General Plan EIR. The improvement would provide room to extend the existing center median area westerly about 220 feet as a Two-Way Left-Turn (TWLT) lane. The second westbound travel lane that ends about 175 feet east of the site could be extended for about 380 feet, and from that point the westbound lane could transition back into the existing roadway centerline along the western half of the site to a point about 150 feet beyond the project's western property line. Within that context, the site line from the western access would originate about 35 feet from the existing centerline. Looking west, the available sight distance would satisfy the minimum requirement once the vegetation along the project frontage is eliminated. Therefore, the project area would include adequate sight distance, and, thus, the proposed project would not increase hazards due to a geometric design feature or incompatible uses, or result in inadequate emergency access.

Multiple Driveways

From review of access to other recent development along similar roads it is apparent that the City of Oakley strives to limit the number of new driveways constructed along four lane streets in order to promote through traffic flow by minimizing the amount of "side friction" caused by local turning movements. In this case, eliminating one access would likely result in the loss of at least one residence. In this case, because the project generates relatively little traffic the overall effect of a second access would not be substantial, and the City could elect to permit the project with access as proposed. Therefore, the proposed project would not substantially increase hazards due to the proposed inclusion of two driveways.

[23] California Department of Transportation. *Highway Design Manual* [pg. 200-1]. November 20, 2017.

Conclusion

Based on the above, the proposed project would not substantially increase hazards due to a geometric design feature or incompatible uses, or result in inadequate emergency access, and a ***less-than-significant*** impact would occur.

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:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
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) 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.	☐	✖	☐	☐

Discussion

a,b. As discussed in Section V, Cultural Resources, of this IS/MND, the Cultural Resources Study prepared for the proposed project included a record search of the NWIC. In addition, a records search of the NAHC SLF was requested on January 31, 2020. Per the NAHC SLF, the site does not contain known tribal cultural resources. In addition, the field survey conducted by Tom Origer & Associates did not identify any indications of such resources.

In compliance with AB 52 (Public Resources Code Section 21080.3.1) and SB 18, a project notification letter was distributed to the following tribes on April 2, 2019: the Amah Mutsun Tribal Band, Amah Mutsun Tribal Band of Mission San Juan Bautista, Indian Canyon Mutsun Band of Costanoan, North Valley Yokuts Tribe, The Ohline Indian Tribe, and Wilton Rancheria. One tribe requested a copy of the Phase I Literature Search and/or results of a foot survey of the project site.

Based on the history of disturbance at the project site as a result of regular disking and agricultural uses, as well as the lack of identified tribal cultural resources at the site, tribal cultural resources are not expected to occur within the site. Nevertheless, the possibility exists that development of the proposed project could result in a substantial adverse change in the significance of a tribal cultural resource if previously unknown tribal cultural resources are uncovered during grading or other ground-disturbing activities. Thus, a ***potentially significant*** impact to tribal cultural resources could occur.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact to a *less-than-significant* level.

XVIII-1. Implement Mitigation Measures V-1 and V-2.

XIX. UTILITIES AND SERVICE SYSTEMS. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Require or result in the relocation or construction of new or expanded water, wastewater treatment, or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	✖	☐
b. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?	☐	☐	✖	☐
c. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	✖	☐
d. Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	✖	☐
e. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	✖	☐

Discussion

a-c. Electricity, natural gas, telecommunications, water, and sanitary sewer services would be provided by way of new connections to existing infrastructure in the immediate project area. Electricity and natural gas services for the proposed project would be provided by PG&E. Brief discussions of water, sewer service, stormwater drainage, electrical, natural gas, and telecommunications that would serve the proposed project are included below.

Water

Water service for the proposed project would be provided by the DWD. DWD's primary water supply for distribution is treated surface water from the Bureau of Reclamations purchased from the Contra Costa Water District. According to the DWD Final 2015 Urban Water Management Plan (UWMP), the DWD has a baseline per capita demand of 177 gallons.[24] The proposed project would develop 22 single-family residences. Based on the City of Oakey's estimate of 3.26 persons per household, the proposed project would add approximately 72 residents to the area. Thus, the project is projected to use 12,744 gallons per day, or 14.28 acre-feet per year. The 2015 UWMP indicates that total water supply in the City is anticipated to increase from 16,838 acre-feet in 2020 to 20,411 acre-feet in 2040. During that time, the DWD's anticipated surplus in water would go from 9,894 acre-feet to 6,717 acre-feet. Although the proposed project would add additional demand to the DWD's current demand, it is important to note that the project site has been anticipated for development by the City of Oakley's General Plan. The DWD's demand estimates generally consider increases in demand due to buildout of the City's General Plan;

[24] Diablo Water District. *Final 2015 Urban Water Management Plan* [pg. 3-5]. June 2016.

consequently, the DWD has anticipated some level of increased water demand due to development of the project site. Thus, while the proposed project would result in increased water consumption at the project site, some or all of this increase in demand has been captured in DWD's demand projections. Even in the vent that DWD has not anticipated the increased demand, DWD maintains an anticipated surplus in future water supplies, which would be more than sufficient to accommodate increased demand from the project site. Thus, given the relatively small increase in water demand due to the project and DWD's anticipated water surplus, adequate long-term water supply exists.

Sewer Service

Sanitary sewer services are provided to the project site by ISD. The wastewater system is composed of collection, treatment, and effluent recycling facilities. The District operates and maintains the sewer system, which collects wastewater flows from individual developments within the City and conveys them to the District's Water Recycling Facility. Wastewater is ultimately treated and stored either on-site in a large 76 million gallon holding pond or the treated water is conveyed to an outfall pipe in the San Joaquin River. The Water Recycling Facility has an average daily flow of 2.3 million gallons per day (mgd). The facility has a treatment capacity of approximately 4.3 mgd. Using standard industry assumptions that (1) domestic water use represents 40 percent of consumption; and (2) wastewater generation represents 90 percent of domestic water use, the proposed project would generate approximately 11,470 gallons of effluent on a daily basis. Thus, the addition of wastewater from the project would represent less than one percent of the available treatment capacity. In addition, because the site has been anticipated for development in the City's General Plan, and, thus, anticipated by the ISD, the increase in effluent associated with the proposed project would not be entirely new. Therefore, given the available capacity within the wastewater facility and the small generation of wastewater, the proposed project would not result in inadequate capacity to serve the project's projected demand in addition to the existing commitments.

Stormwater Systems

As discussed above in Section X, Hydrology, of this IS/MND, stormwater generated by impervious surfaces would be directed to the various bio-treatment areas located along the project site frontage. In addition, stormwater would infiltrate on-site soils and percolate into the groundwater table. Implementation of Mitigation Measures X-1 through X-3 would ensure that on-site drainage systems comply with the City's SWPPP and erosion and sediment control plan, as well as the County C.3 standards. Additionally, because the site has been anticipated for development by the City General Plan, impacts to stormwater systems resulting from development of the site have been generally analyzed in the City's General Plan EIR.

Other Utilities

Electricity, natural gas, and telecommunications utilities would be provided by way of connections to existing infrastructure located within the immediate project vicinity. PG&E would provide electricity and natural gas services to the project site, while AT&T would provide telecommunication services. The proposed project would not require major upgrades to, or extension of, existing infrastructure. Thus, impacts to electricity, natural gas, and telecommunications infrastructure would be less than significant.

Conclusions

Based on the above, the project would result in a ***less-than-significant*** impact related to the relocation or construction of new or expanded water, wastewater treatment, or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects.

d,e. Solid waste, recyclable materials, and compostable material collection within the City of Oakley is hauled to Potrero Hills Landfill located in Solano County to the north of the City. The landfill has a maximum permitted throughput of 4,330 tons per day. According to the California Department of Resources Recycling and Recovery (CalRecycle), the Potrero Hills Landfill has a remaining capacity of 13,872,000 cubic yards out of a total permitted capacity of 83,100,000 cubic yards, or 17 percent of the landfill's remaining capacity.[25] Additionally, because the site has been anticipated for development by the City General Plan, impacts related to solid waste resulting from development of the site have been generally analyzed in the City's General Plan EIR. Due to the remaining available capacity remaining at Potrero Hills Landfill, sufficient capacity would be available to accommodate the project's solid waste disposal needs. Therefore, a ***less-than-significant*** impact related to solid waste would occur as a result of the proposed project.

[25] California Department of Resources Recycling and Recovery (CalRecycle). *Facility/Site Summary Details: Potrero Hill Landfill (48-AA-0075)*. Available at: https://www2.calrecycle.ca.gov/swfacilities/Directory/48-AA-0075/. Accessed February 2020.

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

Discussion

a-d. According to the California Department of Forestry and Fire Protection (CAL FIRE) Fire and Resource Assessment Program, the project site is not located within a Very High or High FHSZ.[26] In addition, the project site is located near existing development and is not subject to risks related to wildfires. Thus, the proposed project would not result in substantial risks or hazards related to wildfires, and a ***less-than-significant*** impact would occur.

[26] California Department of Forestry and Fire Protection. *Contra Costa County, Fire Hazard Severity Zones in SRA*. November 7, 2009.

XXI. MANDATORY FINDINGS OF SIGNIFICANCE.	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
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?	☐	☐	✖	☐

Discussion

a. As discussed in Section IV, Biological Resources, of this IS/MND, while a limited potential exists for Swainson's hawk, golden eagle, and nesting raptors and migratory birds protected by the MBTA to occur on-site, Mitigation Measures IV-1 through IV-7 would ensure that any impacts related to special-status species would be reduced to a less-than-significant level.

In addition, the project site does not contain any on-site structures or known historic or prehistoric resources. Implementation of the proposed project is not anticipated to have the potential to result in impacts related to historic or prehistoric resources. Nevertheless, Mitigation Measures V-1 and V-2 would ensure that in the event that prehistoric resources are discovered within the project site, such resources would be protected in compliance with the requirements of CEQA and other State standards.

Considering the above, the proposed project would not degrade the quality of the environment, substantially reduce or impact the habitat of fish or wildlife species, cause fish or wildlife populations to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory. Therefore, a ***less-than-significant*** impact would occur.

b. The proposed project, in conjunction with other development within the City of Oakley, could incrementally contribute to cumulative impacts in the area. However, as demonstrated in this IS/MND, all potential environmental impacts that could occur as a result of project implementation would be reduced to a less-than-significant level through compliance with the mitigation measures included in this IS/MND, as well as applicable

General Plan policies, Municipal Code standards, and other applicable local and State regulations.

All cumulative impacts related to air quality, noise, and transportation are either less than significant after mitigation or less than significant and do not require mitigation. Given the scope of the project, any incremental effects would not be considerable relative to the effects of all past, current, and probably future projects. In addition, although buildout of the site was not anticipated for residential uses, general development of the site has anticipated, and development of residential uses would not result in greater impacts compared to development of the site with industrial use. As such, the proposed project is within the realm of what has been anticipated for the site and potential impacts resulting from development of the project have been analyzed in the General Plan EIR. Therefore, when viewed in conjunction with other closely related past, present, or reasonably foreseeable future projects, development of the proposed project would not result in a cumulatively considerable contribution to cumulative impacts, and the project's incremental contribution to cumulative impacts would be ***less than significant***.

c. As described in this IS/MND, the proposed project would comply with all applicable General Plan policies, Municipal Code standards, other applicable local and State regulations, and mitigation measures included herein. In addition, as discussed in Section VII, Geology and Soils, Section IX, Hazards and Hazardous Materials, and Section XIII, Noise, of this IS/MND, the proposed project would not cause substantial effects to human beings, including effects related to exposure to hazardous materials and noise. For example, Mitigation Measure IX-1 would require an analysis of on-site soils to ensure that any existing soil contaminant concentrations are below the direct exposure ESLs for residential developments. Therefore, the proposed project would result in a ***less-than-significant*** impact.

APPENDIX A

AIR QUALITY AND GREENHOUSE GAS EMISSIONS – CALEEMOD RESULTS

2480 Oakley Road

Bay Area AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	22.00	Dwelling Unit	4.60	39,600.00	63

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	4			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	269.5	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - CO2 Intensity factor adjusted per PG&E progress towards RPS

Land Use - Based on project plans

Construction Phase -

Grading - Based on site plans

Vehicle Trips - Per project-specific TIA

Energy Mitigation -

Table Name	Column Name	Default Value	New Value
tblGrading	AcresOfGrading	4.00	4.60
tblLandUse	LotAcreage	7.14	4.60
tblProjectCharacteristics	CO2IntensityFactor	641.35	269.5
tblVehicleTrips	WD_TR	9.52	9.44

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					
2020	0.1947	1.7861	1.5059	2.5000e-003	0.0787	0.1012	0.1799	0.0402	0.0949	0.1352	0.0000	215.8396	215.8396	0.0522	0.0000	217.1443
2021	0.3569	0.7121	0.7026	1.1700e-003	4.1600e-003	0.0387	0.0429	1.1200e-003	0.0363	0.0375	0.0000	100.6913	100.6913	0.0239	0.0000	101.2899
Maximum	**0.3569**	**1.7861**	**1.5059**	**2.5000e-003**	**0.0787**	**0.1012**	**0.1799**	**0.0402**	**0.0949**	**0.1352**	**0.0000**	**215.8396**	**215.8396**	**0.0522**	**0.0000**	**217.1443**

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					
2020	0.1947	1.7861	1.5059	2.5000e-003	0.0787	0.1012	0.1799	0.0402	0.0949	0.1352	0.0000	215.8394	215.8394	0.0522	0.0000	217.1441
2021	0.3569	0.7121	0.7026	1.1700e-003	4.1600e-003	0.0387	0.0429	1.1200e-003	0.0363	0.0375	0.0000	100.6911	100.6911	0.0239	0.0000	101.2898
Maximum	**0.3569**	**1.7861**	**1.5059**	**2.5000e-003**	**0.0787**	**0.1012**	**0.1799**	**0.0402**	**0.0949**	**0.1352**	**0.0000**	**215.8394**	**215.8394**	**0.0522**	**0.0000**	**217.1441**

	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**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	5-1-2020	7-31-2020	0.8031	0.8031
2	8-1-2020	10-31-2020	0.7093	0.7093
3	11-1-2020	1-31-2021	0.6874	0.6874
4	2-1-2021	4-30-2021	0.5580	0.5580
5	5-1-2021	7-31-2021	0.3039	0.3039
		Highest	0.8031	0.8031

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	0.3171	4.7300e-003	0.3521	4.0000e-004		0.0281	0.0281		0.0281	0.0281	2.7964	0.9535	3.7499	5.5400e-003	1.6000e-004	3.9361
Energy	3.4500e-003	0.0295	0.0125	1.9000e-004		2.3800e-003	2.3800e-003		2.3800e-003	2.3800e-003	0.0000	55.8809	55.8809	3.0000e-003	1.1100e-003	56.2866
Mobile	0.0513	0.2523	0.5753	2.0500e-003	0.1776	1.8600e-003	0.1794	0.0477	1.7400e-003	0.0494	0.0000	188.5891	188.5891	6.9600e-003	0.0000	188.7632
Waste						0.0000	0.0000		0.0000	0.0000	5.3711	0.0000	5.3711	0.3174	0.0000	13.3068
Water						0.0000	0.0000		0.0000	0.0000	0.4548	1.3348	1.7895	0.0469	1.1300e-003	3.2983
Total	**0.3719**	**0.2865**	**0.9399**	**2.6400e-003**	**0.1776**	**0.0323**	**0.2099**	**0.0477**	**0.0322**	**0.0799**	**8.6223**	**246.7582**	**255.3805**	**0.3798**	**2.4000e-003**	**265.5908**

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	0.3171	4.7300e-003	0.3521	4.0000e-004		0.0281	0.0281		0.0281	0.0281	2.7964	0.9535	3.7499	5.5400e-003	1.6000e-004	3.9361
Energy	3.4500e-003	0.0295	0.0125	1.9000e-004		2.3800e-003	2.3800e-003		2.3800e-003	2.3800e-003	0.0000	34.1225	34.1225	6.5000e-004	6.3000e-004	34.3253
Mobile	0.0513	0.2523	0.5753	2.0500e-003	0.1776	1.8600e-003	0.1794	0.0477	1.7400e-003	0.0494	0.0000	188.5891	188.5891	6.9600e-003	0.0000	188.7632
Waste						0.0000	0.0000		0.0000	0.0000	5.3711	0.0000	5.3711	0.3174	0.0000	13.3068
Water						0.0000	0.0000		0.0000	0.0000	0.4548	1.3348	1.7895	0.0469	1.1300e-003	3.2983
Total	**0.3719**	**0.2865**	**0.9399**	**2.6400e-003**	**0.1776**	**0.0323**	**0.2099**	**0.0477**	**0.0322**	**0.0799**	**8.6223**	**224.9999**	**233.6222**	**0.3774**	**1.9200e-003**	**243.6296**

	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**	**8.82**	**8.52**	**0.62**	**20.00**	**8.27**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	5/1/2020	5/7/2020	5	5	
2	Grading	Grading	5/8/2020	5/19/2020	5	8	
3	Building Construction	Building Construction	5/20/2020	4/6/2021	5	230	
4	Paving	Paving	4/7/2021	4/30/2021	5	18	
5	Architectural Coating	Architectural Coating	5/1/2021	5/26/2021	5	18	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 4.604

Acres of Paving: 0

Residential Indoor: 80,190; Residential Outdoor: 26,730; 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
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
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
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	6.00	132	0.36
Paving	Rollers	2	6.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	8.00	2.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	2.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2020

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					0.0452	0.0000	0.0452	0.0248	0.0000	0.0248	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0102	0.1060	0.0538	1.0000e-004		5.4900e-003	5.4900e-003		5.0500e-003	5.0500e-003	0.0000	8.3577	8.3577	2.7000e-003	0.0000	8.4253
Total	**0.0102**	**0.1060**	**0.0538**	**1.0000e-004**	**0.0452**	**5.4900e-003**	**0.0507**	**0.0248**	**5.0500e-003**	**0.0299**	**0.0000**	**8.3577**	**8.3577**	**2.7000e-003**	**0.0000**	**8.4253**

3.2 Site Preparation - 2020

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	1.5000e-004	1.1000e-004	1.1100e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3115	0.3115	1.0000e-005	0.0000	0.3117
Total	**1.5000e-004**	**1.1000e-004**	**1.1100e-003**	**0.0000**	**3.6000e-004**	**0.0000**	**3.6000e-004**	**9.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.3115**	**0.3115**	**1.0000e-005**	**0.0000**	**0.3117**

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					0.0452	0.0000	0.0452	0.0248	0.0000	0.0248	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0102	0.1060	0.0538	1.0000e-004		5.4900e-003	5.4900e-003		5.0500e-003	5.0500e-003	0.0000	8.3577	8.3577	2.7000e-003	0.0000	8.4252
Total	**0.0102**	**0.1060**	**0.0538**	**1.0000e-004**	**0.0452**	**5.4900e-003**	**0.0507**	**0.0248**	**5.0500e-003**	**0.0299**	**0.0000**	**8.3577**	**8.3577**	**2.7000e-003**	**0.0000**	**8.4252**

3.2 Site Preparation - 2020

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	1.5000e-004	1.1000e-004	1.1100e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3115	0.3115	1.0000e-005	0.0000	0.3117
Total	**1.5000e-004**	**1.1000e-004**	**1.1100e-003**	**0.0000**	**3.6000e-004**	**0.0000**	**3.6000e-004**	**9.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.3115**	**0.3115**	**1.0000e-005**	**0.0000**	**0.3117**

3.3 Grading - 2020

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					0.0265	0.0000	0.0265	0.0135	0.0000	0.0135	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.7200e-003	0.1055	0.0642	1.2000e-004		5.0900e-003	5.0900e-003		4.6900e-003	4.6900e-003	0.0000	10.4235	10.4235	3.3700e-003	0.0000	10.5078
Total	**9.7200e-003**	**0.1055**	**0.0642**	**1.2000e-004**	**0.0265**	**5.0900e-003**	**0.0316**	**0.0135**	**4.6900e-003**	**0.0182**	**0.0000**	**10.4235**	**10.4235**	**3.3700e-003**	**0.0000**	**10.5078**

3.3 Grading - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-004	1.4000e-004	1.4700e-003	0.0000	4.7000e-004	0.0000	4.8000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.4154	0.4154	1.0000e-005	0.0000	0.4156
Total	**2.0000e-004**	**1.4000e-004**	**1.4700e-003**	**0.0000**	**4.7000e-004**	**0.0000**	**4.8000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.4154**	**0.4154**	**1.0000e-005**	**0.0000**	**0.4156**

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					0.0265	0.0000	0.0265	0.0135	0.0000	0.0135	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.7200e-003	0.1055	0.0642	1.2000e-004		5.0900e-003	5.0900e-003		4.6900e-003	4.6900e-003	0.0000	10.4235	10.4235	3.3700e-003	0.0000	10.5078
Total	**9.7200e-003**	**0.1055**	**0.0642**	**1.2000e-004**	**0.0265**	**5.0900e-003**	**0.0316**	**0.0135**	**4.6900e-003**	**0.0182**	**0.0000**	**10.4235**	**10.4235**	**3.3700e-003**	**0.0000**	**10.5078**

3.3 Grading - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-004	1.4000e-004	1.4700e-003	0.0000	4.7000e-004	0.0000	4.8000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.4154	0.4154	1.0000e-005	0.0000	0.4156
Total	**2.0000e-004**	**1.4000e-004**	**1.4700e-003**	**0.0000**	**4.7000e-004**	**0.0000**	**4.8000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.4154**	**0.4154**	**1.0000e-005**	**0.0000**	**0.4156**

3.4 Building Construction - 2020

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	0.1717	1.5541	1.3647	2.1800e-003		0.0905	0.0905		0.0851	0.0851	0.0000	187.6041	187.6041	0.0458	0.0000	188.7483
Total	**0.1717**	**1.5541**	**1.3647**	**2.1800e-003**		**0.0905**	**0.0905**		**0.0851**	**0.0851**	**0.0000**	**187.6041**	**187.6041**	**0.0458**	**0.0000**	**188.7483**

3.4 Building Construction - 2020

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	6.3000e-004	0.0187	4.7000e-003	4.0000e-005	1.0600e-003	9.0000e-005	1.1500e-003	3.1000e-004	9.0000e-005	3.9000e-004	0.0000	4.2415	4.2415	2.2000e-004	0.0000	4.2469
Worker	2.1500e-003	1.5400e-003	0.0159	5.0000e-005	5.1200e-003	3.0000e-005	5.1500e-003	1.3600e-003	3.0000e-005	1.3900e-003	0.0000	4.4860	4.4860	1.1000e-004	0.0000	4.4887
Total	**2.7800e-003**	**0.0202**	**0.0206**	**9.0000e-005**	**6.1800e-003**	**1.2000e-004**	**6.3000e-003**	**1.6700e-003**	**1.2000e-004**	**1.7800e-003**	**0.0000**	**8.7275**	**8.7275**	**3.3000e-004**	**0.0000**	**8.7356**

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	0.1717	1.5541	1.3647	2.1800e-003		0.0905	0.0905		0.0851	0.0851	0.0000	187.6039	187.6039	0.0458	0.0000	188.7481
Total	**0.1717**	**1.5541**	**1.3647**	**2.1800e-003**		**0.0905**	**0.0905**		**0.0851**	**0.0851**	**0.0000**	**187.6039**	**187.6039**	**0.0458**	**0.0000**	**188.7481**

3.4 Building Construction - 2020

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	6.3000e-004	0.0187	4.7000e-003	4.0000e-005	1.0600e-003	9.0000e-005	1.1500e-003	3.1000e-004	9.0000e-005	3.9000e-004	0.0000	4.2415	4.2415	2.2000e-004	0.0000	4.2469
Worker	2.1500e-003	1.5400e-003	0.0159	5.0000e-005	5.1200e-003	3.0000e-005	5.1500e-003	1.3600e-003	3.0000e-005	1.3900e-003	0.0000	4.4860	4.4860	1.1000e-004	0.0000	4.4887
Total	**2.7800e-003**	**0.0202**	**0.0206**	**9.0000e-005**	**6.1800e-003**	**1.2000e-004**	**6.3000e-003**	**1.6700e-003**	**1.2000e-004**	**1.7800e-003**	**0.0000**	**8.7275**	**8.7275**	**3.3000e-004**	**0.0000**	**8.7356**

3.4 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0646	0.5927	0.5636	9.2000e-004		0.0326	0.0326		0.0306	0.0306	0.0000	78.7567	78.7567	0.0190	0.0000	79.2317
Total	**0.0646**	**0.5927**	**0.5636**	**9.2000e-004**		**0.0326**	**0.0326**		**0.0306**	**0.0306**	**0.0000**	**78.7567**	**78.7567**	**0.0190**	**0.0000**	**79.2317**

3.4 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.2000e-004	7.1000e-003	1.7700e-003	2.0000e-005	4.5000e-004	2.0000e-005	4.6000e-004	1.3000e-004	1.0000e-005	1.4000e-004	0.0000	1.7635	1.7635	9.0000e-005	0.0000	1.7657
Worker	8.3000e-004	5.8000e-004	6.1000e-003	2.0000e-005	2.1500e-003	1.0000e-005	2.1600e-003	5.7000e-004	1.0000e-005	5.8000e-004	0.0000	1.8169	1.8169	4.0000e-005	0.0000	1.8180
Total	**1.0500e-003**	**7.6800e-003**	**7.8700e-003**	**4.0000e-005**	**2.6000e-003**	**3.0000e-005**	**2.6200e-003**	**7.0000e-004**	**2.0000e-005**	**7.2000e-004**	**0.0000**	**3.5805**	**3.5805**	**1.3000e-004**	**0.0000**	**3.5837**

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	0.0646	0.5927	0.5636	9.2000e-004		0.0326	0.0326		0.0306	0.0306	0.0000	78.7566	78.7566	0.0190	0.0000	79.2316
Total	**0.0646**	**0.5927**	**0.5636**	**9.2000e-004**		**0.0326**	**0.0326**		**0.0306**	**0.0306**	**0.0000**	**78.7566**	**78.7566**	**0.0190**	**0.0000**	**79.2316**

3.4 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.2000e-004	7.1000e-003	1.7700e-003	2.0000e-005	4.5000e-004	2.0000e-005	4.6000e-004	1.3000e-004	1.0000e-005	1.4000e-004	0.0000	1.7635	1.7635	9.0000e-005	0.0000	1.7657
Worker	8.3000e-004	5.8000e-004	6.1000e-003	2.0000e-005	2.1500e-003	1.0000e-005	2.1600e-003	5.7000e-004	1.0000e-005	5.8000e-004	0.0000	1.8169	1.8169	4.0000e-005	0.0000	1.8180
Total	**1.0500e-003**	**7.6800e-003**	**7.8700e-003**	**4.0000e-005**	**2.6000e-003**	**3.0000e-005**	**2.6200e-003**	**7.0000e-004**	**2.0000e-005**	**7.2000e-004**	**0.0000**	**3.5805**	**3.5805**	**1.3000e-004**	**0.0000**	**3.5837**

3.5 Paving - 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	9.8500e-003	0.0976	0.1103	1.7000e-004		5.2100e-003	5.2100e-003		4.8100e-003	4.8100e-003	0.0000	14.7336	14.7336	4.6300e-003	0.0000	14.8493
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**9.8500e-003**	**0.0976**	**0.1103**	**1.7000e-004**		**5.2100e-003**	**5.2100e-003**		**4.8100e-003**	**4.8100e-003**	**0.0000**	**14.7336**	**14.7336**	**4.6300e-003**	**0.0000**	**14.8493**

3.5 Paving - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.5000e-004	3.8000e-004	4.0400e-003	1.0000e-005	1.4200e-003	1.0000e-005	1.4300e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.2024	1.2024	3.0000e-005	0.0000	1.2031
Total	**5.5000e-004**	**3.8000e-004**	**4.0400e-003**	**1.0000e-005**	**1.4200e-003**	**1.0000e-005**	**1.4300e-003**	**3.8000e-004**	**1.0000e-005**	**3.9000e-004**	**0.0000**	**1.2024**	**1.2024**	**3.0000e-005**	**0.0000**	**1.2031**

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	9.8500e-003	0.0976	0.1103	1.7000e-004		5.2100e-003	5.2100e-003		4.8100e-003	4.8100e-003	0.0000	14.7335	14.7335	4.6300e-003	0.0000	14.8493
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**9.8500e-003**	**0.0976**	**0.1103**	**1.7000e-004**		**5.2100e-003**	**5.2100e-003**		**4.8100e-003**	**4.8100e-003**	**0.0000**	**14.7335**	**14.7335**	**4.6300e-003**	**0.0000**	**14.8493**

3.5 Paving - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.5000e-004	3.8000e-004	4.0400e-003	1.0000e-005	1.4200e-003	1.0000e-005	1.4300e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.2024	1.2024	3.0000e-005	0.0000	1.2031
Total	**5.5000e-004**	**3.8000e-004**	**4.0400e-003**	**1.0000e-005**	**1.4200e-003**	**1.0000e-005**	**1.4300e-003**	**3.8000e-004**	**1.0000e-005**	**3.9000e-004**	**0.0000**	**1.2024**	**1.2024**	**3.0000e-005**	**0.0000**	**1.2031**

3.6 Architectural Coating - 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					
Archit. Coating	0.2788					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.9700e-003	0.0137	0.0164	3.0000e-005		8.5000e-004	8.5000e-004		8.5000e-004	8.5000e-004	0.0000	2.2979	2.2979	1.6000e-004	0.0000	2.3019
Total	**0.2807**	**0.0137**	**0.0164**	**3.0000e-005**		**8.5000e-004**	**8.5000e-004**		**8.5000e-004**	**8.5000e-004**	**0.0000**	**2.2979**	**2.2979**	**1.6000e-004**	**0.0000**	**2.3019**

3.6 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.0000e-005	4.0000e-005	4.0000e-004	0.0000	1.4000e-004	0.0000	1.4000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1202	0.1202	0.0000	0.0000	0.1203
Total	**6.0000e-005**	**4.0000e-005**	**4.0000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**1.4000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.1202**	**0.1202**	**0.0000**	**0.0000**	**0.1203**

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	0.2788					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.9700e-003	0.0137	0.0164	3.0000e-005		8.5000e-004	8.5000e-004		8.5000e-004	8.5000e-004	0.0000	2.2979	2.2979	1.6000e-004	0.0000	2.3019
Total	**0.2807**	**0.0137**	**0.0164**	**3.0000e-005**		**8.5000e-004**	**8.5000e-004**		**8.5000e-004**	**8.5000e-004**	**0.0000**	**2.2979**	**2.2979**	**1.6000e-004**	**0.0000**	**2.3019**

3.6 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.0000e-005	4.0000e-005	4.0000e-004	0.0000	1.4000e-004	0.0000	1.4000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1202	0.1202	0.0000	0.0000	0.1203
Total	**6.0000e-005**	**4.0000e-005**	**4.0000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**1.4000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.1202**	**0.1202**	**0.0000**	**0.0000**	**0.1203**

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	0.0513	0.2523	0.5753	2.0500e-003	0.1776	1.8600e-003	0.1794	0.0477	1.7400e-003	0.0494	0.0000	188.5891	188.5891	6.9600e-003	0.0000	188.7632
Unmitigated	0.0513	0.2523	0.5753	2.0500e-003	0.1776	1.8600e-003	0.1794	0.0477	1.7400e-003	0.0494	0.0000	188.5891	188.5891	6.9600e-003	0.0000	188.7632

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	207.68	218.02	189.64	477,119	477,119
Total	207.68	218.02	189.64	477,119	477,119

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	10.80	4.80	5.70	31.00	15.00	54.00	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	0.576985	0.039376	0.193723	0.112069	0.016317	0.005358	0.017943	0.025814	0.002614	0.002274	0.005874	0.000887	0.000768

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Percent of Electricity Use Generated with Renewable 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	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	21.7584	21.7584	2.3400e-003	4.8000e-004	21.9613
NaturalGas Mitigated	3.4500e-003	0.0295	0.0125	1.9000e-004		2.3800e-003	2.3800e-003		2.3800e-003	2.3800e-003	0.0000	34.1225	34.1225	6.5000e-004	6.3000e-004	34.3253
NaturalGas Unmitigated	3.4500e-003	0.0295	0.0125	1.9000e-004		2.3800e-003	2.3800e-003		2.3800e-003	2.3800e-003	0.0000	34.1225	34.1225	6.5000e-004	6.3000e-004	34.3253

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	639432	3.4500e-003	0.0295	0.0125	1.9000e-004		2.3800e-003	2.3800e-003		2.3800e-003	2.3800e-003	0.0000	34.1225	34.1225	6.5000e-004	6.3000e-004	34.3253
Total		**3.4500e-003**	**0.0295**	**0.0125**	**1.9000e-004**		**2.3800e-003**	**2.3800e-003**		**2.3800e-003**	**2.3800e-003**	**0.0000**	**34.1225**	**34.1225**	**6.5000e-004**	**6.3000e-004**	**34.3253**

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	639432	3.4500e-003	0.0295	0.0125	1.9000e-004		2.3800e-003	2.3800e-003		2.3800e-003	2.3800e-003	0.0000	34.1225	34.1225	6.5000e-004	6.3000e-004	34.3253
Total		**3.4500e-003**	**0.0295**	**0.0125**	**1.9000e-004**		**2.3800e-003**	**2.3800e-003**		**2.3800e-003**	**2.3800e-003**	**0.0000**	**34.1225**	**34.1225**	**6.5000e-004**	**6.3000e-004**	**34.3253**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	177993	21.7584	2.3400e-003	4.8000e-004	21.9613
Total		**21.7584**	**2.3400e-003**	**4.8000e-004**	**21.9613**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

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	0.3171	4.7300e-003	0.3521	4.0000e-004		0.0281	0.0281		0.0281	0.0281	2.7964	0.9535	3.7499	5.5400e-003	1.6000e-004	3.9361
Unmitigated	0.3171	4.7300e-003	0.3521	4.0000e-004		0.0281	0.0281		0.0281	0.0281	2.7964	0.9535	3.7499	5.5400e-003	1.6000e-004	3.9361

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	0.0279					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1547					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.1297	2.8400e-003	0.1886	3.9000e-004		0.0272	0.0272		0.0272	0.0272	2.7964	0.6866	3.4831	5.2800e-003	1.6000e-004	3.6628
Landscaping	4.9400e-003	1.8900e-003	0.1635	1.0000e-005		9.0000e-004	9.0000e-004		9.0000e-004	9.0000e-004	0.0000	0.2668	0.2668	2.6000e-004	0.0000	0.2733
Total	**0.3172**	**4.7300e-003**	**0.3521**	**4.0000e-004**		**0.0281**	**0.0281**		**0.0281**	**0.0281**	**2.7964**	**0.9535**	**3.7499**	**5.5400e-003**	**1.6000e-004**	**3.9361**

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	0.0279					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1547					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.1297	2.8400e-003	0.1886	3.9000e-004		0.0272	0.0272		0.0272	0.0272	2.7964	0.6866	3.4831	5.2800e-003	1.6000e-004	3.6628
Landscaping	4.9400e-003	1.8900e-003	0.1635	1.0000e-005		9.0000e-004	9.0000e-004		9.0000e-004	9.0000e-004	0.0000	0.2668	0.2668	2.6000e-004	0.0000	0.2733
Total	**0.3172**	**4.7300e-003**	**0.3521**	**4.0000e-004**		**0.0281**	**0.0281**		**0.0281**	**0.0281**	**2.7964**	**0.9535**	**3.7499**	**5.5400e-003**	**1.6000e-004**	**3.9361**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	1.7895	0.0469	1.1300e-003	3.2983
Unmitigated	1.7895	0.0469	1.1300e-003	3.2983

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	1.43339 / 0.903658	1.7895	0.0469	1.1300e-003	3.2983
Total		**1.7895**	**0.0469**	**1.1300e-003**	**3.2983**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	1.43339 / 0.903658	1.7895	0.0469	1.1300e-003	3.2983
Total		**1.7895**	**0.0469**	**1.1300e-003**	**3.2983**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	5.3711	0.3174	0.0000	13.3068
Unmitigated	5.3711	0.3174	0.0000	13.3068

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	26.46	5.3711	0.3174	0.0000	13.3068
Total		**5.3711**	**0.3174**	**0.0000**	**13.3068**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	26.46	5.3711	0.3174	0.0000	13.3068
Total		**5.3711**	**0.3174**	**0.0000**	**13.3068**

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

2480 Oakley Road

Bay Area AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	22.00	Dwelling Unit	4.60	39,600.00	63

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	4			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	269.5	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - CO2 Intensity factor adjusted per PG&E progress towards RPS

Land Use - Based on project plans

Construction Phase -

Grading - Based on site plans

Vehicle Trips - Per project-specific TIA

Energy Mitigation -

Table Name	Column Name	Default Value	New Value
tblGrading	AcresOfGrading	4.00	4.60
tblLandUse	LotAcreage	7.14	4.60
tblProjectCharacteristics	CO2IntensityFactor	641.35	269.5
tblVehicleTrips	WD_TR	9.52	9.44

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					
2020	4.1390	42.4552	21.9966	0.0395	18.2141	2.1984	20.4125	9.9699	2.0225	11.9924	0.0000	3,832.8413	3,832.8413	1.1954	0.0000	3,862.7263
2021	31.1987	17.6538	16.8205	0.0281	0.1643	0.9595	1.0387	0.0436	0.9021	0.9234	0.0000	2,674.5124	2,674.5124	0.6201	0.0000	2,690.0160
Maximum	**31.1987**	**42.4552**	**21.9966**	**0.0395**	**18.2141**	**2.1984**	**20.4125**	**9.9699**	**2.0225**	**11.9924**	**0.0000**	**3,832.8413**	**3,832.8413**	**1.1954**	**0.0000**	**3,862.7263**

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					
2020	4.1390	42.4552	21.9966	0.0395	18.2141	2.1984	20.4125	9.9699	2.0225	11.9924	0.0000	3,832.8413	3,832.8413	1.1954	0.0000	3,862.7263
2021	31.1987	17.6538	16.8205	0.0281	0.1643	0.9595	1.0387	0.0436	0.9021	0.9234	0.0000	2,674.5124	2,674.5124	0.6201	0.0000	2,690.0160
Maximum	**31.1987**	**42.4552**	**21.9966**	**0.0395**	**18.2141**	**2.1984**	**20.4125**	**9.9699**	**2.0225**	**11.9924**	**0.0000**	**3,832.8413**	**3,832.8413**	**1.1954**	**0.0000**	**3,862.7263**

	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**

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	23.8541	0.4599	31.3033	0.0556		4.1796	4.1796		4.1796	4.1796	448.3235	139.1505	587.4740	0.5575	0.0316	610.8384
Energy	0.0189	0.1615	0.0687	1.0300e-003		0.0131	0.0131		0.0131	0.0131		206.1022	206.1022	3.9500e-003	3.7800e-003	207.3269
Mobile	0.3407	1.4194	3.4663	0.0126	1.0698	0.0108	1.0806	0.2862	0.0101	0.2963		1,275.4685	1,275.4685	0.0447		1,276.5867
Total	**24.2136**	**2.0408**	**34.8383**	**0.0693**	**1.0698**	**4.2034**	**5.2732**	**0.2862**	**4.2027**	**4.4889**	**448.3235**	**1,620.7212**	**2,069.0446**	**0.6062**	**0.0354**	**2,094.7520**

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	23.8541	0.4599	31.3033	0.0556		4.1796	4.1796		4.1796	4.1796	448.3235	139.1505	587.4740	0.5575	0.0316	610.8384
Energy	0.0189	0.1615	0.0687	1.0300e-003		0.0131	0.0131		0.0131	0.0131		206.1022	206.1022	3.9500e-003	3.7800e-003	207.3269
Mobile	0.3407	1.4194	3.4663	0.0126	1.0698	0.0108	1.0806	0.2862	0.0101	0.2963		1,275.4685	1,275.4685	0.0447		1,276.5867
Total	**24.2136**	**2.0408**	**34.8383**	**0.0693**	**1.0698**	**4.2034**	**5.2732**	**0.2862**	**4.2027**	**4.4889**	**448.3235**	**1,620.7212**	**2,069.0446**	**0.6062**	**0.0354**	**2,094.7520**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	5/1/2020	5/7/2020	5	5	
2	Grading	Grading	5/8/2020	5/19/2020	5	8	
3	Building Construction	Building Construction	5/20/2020	4/6/2021	5	230	
4	Paving	Paving	4/7/2021	4/30/2021	5	18	
5	Architectural Coating	Architectural Coating	5/1/2021	5/26/2021	5	18	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 4.604

Acres of Paving: 0

Residential Indoor: 80,190; Residential Outdoor: 26,730; 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
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
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
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	6.00	132	0.36
Paving	Rollers	2	6.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	8.00	2.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	2.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2020

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					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216		3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0663**	**2.1974**	**20.2637**	**9.9307**	**2.0216**	**11.9523**		**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

3.2 Site Preparation - 2020

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	0.0626	0.0379	0.4830	1.4800e-003	0.1479	9.6000e-004	0.1488	0.0392	8.8000e-004	0.0401		147.7398	147.7398	3.5600e-003		147.8288
Total	**0.0626**	**0.0379**	**0.4830**	**1.4800e-003**	**0.1479**	**9.6000e-004**	**0.1488**	**0.0392**	**8.8000e-004**	**0.0401**		**147.7398**	**147.7398**	**3.5600e-003**		**147.8288**

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					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216	0.0000	3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0663**	**2.1974**	**20.2637**	**9.9307**	**2.0216**	**11.9523**	**0.0000**	**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

3.2 Site Preparation - 2020

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	0.0626	0.0379	0.4830	1.4800e-003	0.1479	9.6000e-004	0.1488	0.0392	8.8000e-004	0.0401		147.7398	147.7398	3.5600e-003		147.8288
Total	**0.0626**	**0.0379**	**0.4830**	**1.4800e-003**	**0.1479**	**9.6000e-004**	**0.1488**	**0.0392**	**8.8000e-004**	**0.0401**		**147.7398**	**147.7398**	**3.5600e-003**		**147.8288**

3.3 Grading - 2020

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					6.6324	0.0000	6.6324	3.3761	0.0000	3.3761			0.0000			0.0000
Off-Road	2.4288	26.3859	16.0530	0.0297		1.2734	1.2734		1.1716	1.1716		2,872.4851	2,872.4851	0.9290		2,895.7106
Total	**2.4288**	**26.3859**	**16.0530**	**0.0297**	**6.6324**	**1.2734**	**7.9058**	**3.3761**	**1.1716**	**4.5477**		**2,872.4851**	**2,872.4851**	**0.9290**		**2,895.7106**

3.3 Grading - 2020

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	0.0521	0.0316	0.4025	1.2400e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		123.1165	123.1165	2.9700e-003		123.1907
Total	**0.0521**	**0.0316**	**0.4025**	**1.2400e-003**	**0.1232**	**8.0000e-004**	**0.1240**	**0.0327**	**7.4000e-004**	**0.0334**		**123.1165**	**123.1165**	**2.9700e-003**		**123.1907**

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					6.6324	0.0000	6.6324	3.3761	0.0000	3.3761			0.0000			0.0000
Off-Road	2.4288	26.3859	16.0530	0.0297		1.2734	1.2734		1.1716	1.1716	0.0000	2,872.4851	2,872.4851	0.9290		2,895.7106
Total	**2.4288**	**26.3859**	**16.0530**	**0.0297**	**6.6324**	**1.2734**	**7.9058**	**3.3761**	**1.1716**	**4.5477**	**0.0000**	**2,872.4851**	**2,872.4851**	**0.9290**		**2,895.7106**

3.3 Grading - 2020

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	0.0521	0.0316	0.4025	1.2400e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		123.1165	123.1165	2.9700e-003		123.1907
Total	**0.0521**	**0.0316**	**0.4025**	**1.2400e-003**	**0.1232**	**8.0000e-004**	**0.1240**	**0.0327**	**7.4000e-004**	**0.0334**		**123.1165**	**123.1165**	**2.9700e-003**		**123.1907**

3.4 Building Construction - 2020

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	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.0631	2,553.0631	0.6229		2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**		**2,553.0631**	**2,553.0631**	**0.6229**		**2,568.6345**

3.4 Building Construction - 2020

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	7.5800e-003	0.2279	0.0544	5.5000e-004	0.0135	1.1200e-003	0.0147	3.9000e-003	1.0700e-003	4.9700e-003		58.3416	58.3416	2.8700e-003		58.4134
Worker	0.0278	0.0168	0.2146	6.6000e-004	0.0657	4.3000e-004	0.0661	0.0174	3.9000e-004	0.0178		65.6621	65.6621	1.5800e-003		65.7017
Total	**0.0354**	**0.2448**	**0.2690**	**1.2100e-003**	**0.0793**	**1.5500e-003**	**0.0808**	**0.0213**	**1.4600e-003**	**0.0228**		**124.0037**	**124.0037**	**4.4500e-003**		**124.1151**

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	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.0631	2,553.0631	0.6229		2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**	**0.0000**	**2,553.0631**	**2,553.0631**	**0.6229**		**2,568.6345**

3.4 Building Construction - 2020

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	7.5800e-003	0.2279	0.0544	5.5000e-004	0.0135	1.1200e-003	0.0147	3.9000e-003	1.0700e-003	4.9700e-003		58.3416	58.3416	2.8700e-003		58.4134
Worker	0.0278	0.0168	0.2146	6.6000e-004	0.0657	4.3000e-004	0.0661	0.0174	3.9000e-004	0.0178		65.6621	65.6621	1.5800e-003		65.7017
Total	**0.0354**	**0.2448**	**0.2690**	**1.2100e-003**	**0.0793**	**1.5500e-003**	**0.0808**	**0.0213**	**1.4600e-003**	**0.0228**		**124.0037**	**124.0037**	**4.4500e-003**		**124.1151**

3.4 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	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**

3.4 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	6.2000e-003	0.2067	0.0487	5.5000e-004	0.0135	4.5000e-004	0.0140	3.9000e-003	4.3000e-004	4.3300e-003		57.7917	57.7917	2.7100e-003		57.8595
Worker	0.0257	0.0150	0.1965	6.4000e-004	0.0657	4.1000e-004	0.0661	0.0174	3.8000e-004	0.0178		63.3568	63.3568	1.4200e-003		63.3922
Total	**0.0319**	**0.2217**	**0.2453**	**1.1900e-003**	**0.0793**	**8.6000e-004**	**0.0801**	**0.0213**	**8.1000e-004**	**0.0221**		**121.1485**	**121.1485**	**4.1300e-003**		**121.2517**

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**

3.4 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	6.2000e-003	0.2067	0.0487	5.5000e-004	0.0135	4.5000e-004	0.0140	3.9000e-003	4.3000e-004	4.3300e-003		57.7917	57.7917	2.7100e-003		57.8595
Worker	0.0257	0.0150	0.1965	6.4000e-004	0.0657	4.1000e-004	0.0661	0.0174	3.8000e-004	0.0178		63.3568	63.3568	1.4200e-003		63.3922
Total	**0.0319**	**0.2217**	**0.2453**	**1.1900e-003**	**0.0793**	**8.6000e-004**	**0.0801**	**0.0213**	**8.1000e-004**	**0.0221**		**121.1485**	**121.1485**	**4.1300e-003**		**121.2517**

3.5 Paving - 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	1.0940	10.8399	12.2603	0.0189		0.5788	0.5788		0.5342	0.5342		1,804.5523	1,804.5523	0.5670		1,818.7270
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0940**	**10.8399**	**12.2603**	**0.0189**		**0.5788**	**0.5788**		**0.5342**	**0.5342**		**1,804.5523**	**1,804.5523**	**0.5670**		**1,818.7270**

3.5 Paving - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0643	0.0376	0.4913	1.5900e-003	0.1643	1.0300e-003	0.1653	0.0436	9.5000e-004	0.0445		158.3919	158.3919	3.5400e-003		158.4804
Total	**0.0643**	**0.0376**	**0.4913**	**1.5900e-003**	**0.1643**	**1.0300e-003**	**0.1653**	**0.0436**	**9.5000e-004**	**0.0445**		**158.3919**	**158.3919**	**3.5400e-003**		**158.4804**

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	1.0940	10.8399	12.2603	0.0189		0.5788	0.5788		0.5342	0.5342	0.0000	1,804.5523	1,804.5523	0.5670		1,818.7270
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0940**	**10.8399**	**12.2603**	**0.0189**		**0.5788**	**0.5788**		**0.5342**	**0.5342**	**0.0000**	**1,804.5523**	**1,804.5523**	**0.5670**		**1,818.7270**

3.5 Paving - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0643	0.0376	0.4913	1.5900e-003	0.1643	1.0300e-003	0.1653	0.0436	9.5000e-004	0.0445		158.3919	158.3919	3.5400e-003		158.4804
Total	**0.0643**	**0.0376**	**0.4913**	**1.5900e-003**	**0.1643**	**1.0300e-003**	**0.1653**	**0.0436**	**9.5000e-004**	**0.0445**		**158.3919**	**158.3919**	**3.5400e-003**		**158.4804**

3.6 Architectural Coating - 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					
Archit. Coating	30.9734					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941		281.4481	281.4481	0.0193		281.9309
Total	**31.1923**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**		**281.4481**	**281.4481**	**0.0193**		**281.9309**

3.6 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	6.4300e-003	3.7600e-003	0.0491	1.6000e-004	0.0164	1.0000e-004	0.0165	4.3600e-003	1.0000e-004	4.4500e-003		15.8392	15.8392	3.5000e-004		15.8480
Total	**6.4300e-003**	**3.7600e-003**	**0.0491**	**1.6000e-004**	**0.0164**	**1.0000e-004**	**0.0165**	**4.3600e-003**	**1.0000e-004**	**4.4500e-003**		**15.8392**	**15.8392**	**3.5000e-004**		**15.8480**

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	30.9734					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941	0.0000	281.4481	281.4481	0.0193		281.9309
Total	**31.1923**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**	**0.0000**	**281.4481**	**281.4481**	**0.0193**		**281.9309**

3.6 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	6.4300e-003	3.7600e-003	0.0491	1.6000e-004	0.0164	1.0000e-004	0.0165	4.3600e-003	1.0000e-004	4.4500e-003		15.8392	15.8392	3.5000e-004		15.8480
Total	**6.4300e-003**	**3.7600e-003**	**0.0491**	**1.6000e-004**	**0.0164**	**1.0000e-004**	**0.0165**	**4.3600e-003**	**1.0000e-004**	**4.4500e-003**		**15.8392**	**15.8392**	**3.5000e-004**		**15.8480**

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	0.3407	1.4194	3.4663	0.0126	1.0698	0.0108	1.0806	0.2862	0.0101	0.2963		1,275.4685	1,275.4685	0.0447		1,276.5867
Unmitigated	0.3407	1.4194	3.4663	0.0126	1.0698	0.0108	1.0806	0.2862	0.0101	0.2963		1,275.4685	1,275.4685	0.0447		1,276.5867

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	207.68	218.02	189.64	477,119	477,119
Total	207.68	218.02	189.64	477,119	477,119

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	10.80	4.80	5.70	31.00	15.00	54.00	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	0.576985	0.039376	0.193723	0.112069	0.016317	0.005358	0.017943	0.025814	0.002614	0.002274	0.005874	0.000887	0.000768

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Percent of Electricity Use Generated with Renewable 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	0.0189	0.1615	0.0687	1.0300e-003		0.0131	0.0131		0.0131	0.0131		206.1022	206.1022	3.9500e-003	3.7800e-003	207.3269
NaturalGas Unmitigated	0.0189	0.1615	0.0687	1.0300e-003		0.0131	0.0131		0.0131	0.0131		206.1022	206.1022	3.9500e-003	3.7800e-003	207.3269

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	1751.87	0.0189	0.1615	0.0687	1.0300e-003		0.0131	0.0131		0.0131	0.0131		206.1022	206.1022	3.9500e-003	3.7800e-003	207.3269
Total		**0.0189**	**0.1615**	**0.0687**	**1.0300e-003**		**0.0131**	**0.0131**		**0.0131**	**0.0131**		**206.1022**	**206.1022**	**3.9500e-003**	**3.7800e-003**	**207.3269**

5.2 Energy by Land Use - NaturalGas

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	1.75187	0.0189	0.1615	0.0687	1.0300e-003		0.0131	0.0131		0.0131	0.0131		206.1022	206.1022	3.9500e-003	3.7800e-003	207.3269
Total		**0.0189**	**0.1615**	**0.0687**	**1.0300e-003**		**0.0131**	**0.0131**		**0.0131**	**0.0131**		**206.1022**	**206.1022**	**3.9500e-003**	**3.7800e-003**	**207.3269**

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	23.8541	0.4599	31.3033	0.0556		4.1796	4.1796		4.1796	4.1796	448.3235	139.1505	587.4740	0.5575	0.0316	610.8384
Unmitigated	23.8541	0.4599	31.3033	0.0556		4.1796	4.1796		4.1796	4.1796	448.3235	139.1505	587.4740	0.5575	0.0316	610.8384

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	0.1528					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.8474					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	22.7990	0.4390	29.4864	0.0555		4.1695	4.1695		4.1695	4.1695	448.3235	135.8824	584.2058	0.5543	0.0316	607.4915
Landscaping	0.0549	0.0210	1.8170	1.0000e-004		0.0100	0.0100		0.0100	0.0100		3.2682	3.2682	3.1500e-003		3.3470
Total	**23.8541**	**0.4600**	**31.3033**	**0.0556**		**4.1796**	**4.1796**		**4.1796**	**4.1796**	**448.3235**	**139.1505**	**587.4740**	**0.5575**	**0.0316**	**610.8384**

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	0.1528					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.8474					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	22.7990	0.4390	29.4864	0.0555		4.1695	4.1695		4.1695	4.1695	448.3235	135.8824	584.2058	0.5543	0.0316	607.4915
Landscaping	0.0549	0.0210	1.8170	1.0000e-004		0.0100	0.0100		0.0100	0.0100		3.2682	3.2682	3.1500e-003		3.3470
Total	**23.8541**	**0.4600**	**31.3033**	**0.0556**		**4.1796**	**4.1796**		**4.1796**	**4.1796**	**448.3235**	**139.1505**	**587.4740**	**0.5575**	**0.0316**	**610.8384**

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

2480 Oakley Road

Bay Area AQMD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	22.00	Dwelling Unit	4.60	39,600.00	63

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	4			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	269.5	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - CO2 Intensity factor adjusted per PG&E progress towards RPS

Land Use - Based on project plans

Construction Phase -

Grading - Based on site plans

Vehicle Trips - Per project-specific TIA

Energy Mitigation -

Table Name	Column Name	Default Value	New Value
tblGrading	AcresOfGrading	4.00	4.60
tblLandUse	LotAcreage	7.14	4.60
tblProjectCharacteristics	CO2IntensityFactor	641.35	269.5
tblVehicleTrips	WD_TR	9.52	9.44

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					
2020	4.1427	42.4641	21.9672	0.0394	18.2141	2.1984	20.4125	9.9699	2.0225	11.9924	0.0000	3,821.1933	3,821.1933	1.1952	0.0000	3,851.0725
2021	31.1991	17.6591	16.8151	0.0280	0.1643	0.9595	1.0388	0.0436	0.9021	0.9234	0.0000	2,668.0523	2,668.0523	0.6203	0.0000	2,683.5590
Maximum	**31.1991**	**42.4641**	**21.9672**	**0.0394**	**18.2141**	**2.1984**	**20.4125**	**9.9699**	**2.0225**	**11.9924**	**0.0000**	**3,821.1933**	**3,821.1933**	**1.1952**	**0.0000**	**3,851.0725**

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					
2020	4.1427	42.4641	21.9672	0.0394	18.2141	2.1984	20.4125	9.9699	2.0225	11.9924	0.0000	3,821.1933	3,821.1933	1.1952	0.0000	3,851.0725
2021	31.1991	17.6591	16.8151	0.0280	0.1643	0.9595	1.0388	0.0436	0.9021	0.9234	0.0000	2,668.0523	2,668.0523	0.6203	0.0000	2,683.5590
Maximum	**31.1991**	**42.4641**	**21.9672**	**0.0394**	**18.2141**	**2.1984**	**20.4125**	**9.9699**	**2.0225**	**11.9924**	**0.0000**	**3,821.1933**	**3,821.1933**	**1.1952**	**0.0000**	**3,851.0725**

	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**

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	23.8541	0.4599	31.3033	0.0556		4.1796	4.1796		4.1796	4.1796	448.3235	139.1505	587.4740	0.5575	0.0316	610.8384
Energy	0.0189	0.1615	0.0687	1.0300e-003		0.0131	0.0131		0.0131	0.0131		206.1022	206.1022	3.9500e-003	3.7800e-003	207.3269
Mobile	0.2949	1.4884	3.4963	0.0118	1.0698	0.0109	1.0806	0.2862	0.0102	0.2964		1,194.1267	1,194.1267	0.0457		1,195.2691
Total	**24.1679**	**2.1098**	**34.8683**	**0.0685**	**1.0698**	**4.2035**	**5.2733**	**0.2862**	**4.2028**	**4.4890**	**448.3235**	**1,539.3794**	**1,987.7028**	**0.6071**	**0.0354**	**2,013.4344**

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	23.8541	0.4599	31.3033	0.0556		4.1796	4.1796		4.1796	4.1796	448.3235	139.1505	587.4740	0.5575	0.0316	610.8384
Energy	0.0189	0.1615	0.0687	1.0300e-003		0.0131	0.0131		0.0131	0.0131		206.1022	206.1022	3.9500e-003	3.7800e-003	207.3269
Mobile	0.2949	1.4884	3.4963	0.0118	1.0698	0.0109	1.0806	0.2862	0.0102	0.2964		1,194.1267	1,194.1267	0.0457		1,195.2691
Total	**24.1679**	**2.1098**	**34.8683**	**0.0685**	**1.0698**	**4.2035**	**5.2733**	**0.2862**	**4.2028**	**4.4890**	**448.3235**	**1,539.3794**	**1,987.7028**	**0.6071**	**0.0354**	**2,013.4344**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	5/1/2020	5/7/2020	5	5	
2	Grading	Grading	5/8/2020	5/19/2020	5	8	
3	Building Construction	Building Construction	5/20/2020	4/6/2021	5	230	
4	Paving	Paving	4/7/2021	4/30/2021	5	18	
5	Architectural Coating	Architectural Coating	5/1/2021	5/26/2021	5	18	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 4.604

Acres of Paving: 0

Residential Indoor: 80,190; Residential Outdoor: 26,730; 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
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
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
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	6.00	132	0.36
Paving	Rollers	2	6.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	8.00	2.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	2.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2020

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					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216		3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0663**	**2.1974**	**20.2637**	**9.9307**	**2.0216**	**11.9523**		**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

3.2 Site Preparation - 2020

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	0.0662	0.0468	0.4536	1.3700e-003	0.1479	9.6000e-004	0.1488	0.0392	8.8000e-004	0.0401		136.0918	136.0918	3.3300e-003		136.1750
Total	**0.0662**	**0.0468**	**0.4536**	**1.3700e-003**	**0.1479**	**9.6000e-004**	**0.1488**	**0.0392**	**8.8000e-004**	**0.0401**		**136.0918**	**136.0918**	**3.3300e-003**		**136.1750**

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					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216	0.0000	3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0663**	**2.1974**	**20.2637**	**9.9307**	**2.0216**	**11.9523**	**0.0000**	**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

3.2 Site Preparation - 2020

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	0.0662	0.0468	0.4536	1.3700e-003	0.1479	9.6000e-004	0.1488	0.0392	8.8000e-004	0.0401		136.0918	136.0918	3.3300e-003		136.1750
Total	**0.0662**	**0.0468**	**0.4536**	**1.3700e-003**	**0.1479**	**9.6000e-004**	**0.1488**	**0.0392**	**8.8000e-004**	**0.0401**		**136.0918**	**136.0918**	**3.3300e-003**		**136.1750**

3.3 Grading - 2020

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					6.6324	0.0000	6.6324	3.3761	0.0000	3.3761			0.0000			0.0000
Off-Road	2.4288	26.3859	16.0530	0.0297		1.2734	1.2734		1.1716	1.1716		2,872.4851	2,872.4851	0.9290		2,895.7106
Total	**2.4288**	**26.3859**	**16.0530**	**0.0297**	**6.6324**	**1.2734**	**7.9058**	**3.3761**	**1.1716**	**4.5477**		**2,872.4851**	**2,872.4851**	**0.9290**		**2,895.7106**

3.3 Grading - 2020

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	0.0552	0.0390	0.3780	1.1400e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		113.4098	113.4098	2.7700e-003		113.4792
Total	**0.0552**	**0.0390**	**0.3780**	**1.1400e-003**	**0.1232**	**8.0000e-004**	**0.1240**	**0.0327**	**7.4000e-004**	**0.0334**		**113.4098**	**113.4098**	**2.7700e-003**		**113.4792**

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					6.6324	0.0000	6.6324	3.3761	0.0000	3.3761			0.0000			0.0000
Off-Road	2.4288	26.3859	16.0530	0.0297		1.2734	1.2734		1.1716	1.1716	0.0000	2,872.4851	2,872.4851	0.9290		2,895.7106
Total	**2.4288**	**26.3859**	**16.0530**	**0.0297**	**6.6324**	**1.2734**	**7.9058**	**3.3761**	**1.1716**	**4.5477**	**0.0000**	**2,872.4851**	**2,872.4851**	**0.9290**		**2,895.7106**

3.3 Grading - 2020

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	0.0552	0.0390	0.3780	1.1400e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		113.4098	113.4098	2.7700e-003		113.4792
Total	**0.0552**	**0.0390**	**0.3780**	**1.1400e-003**	**0.1232**	**8.0000e-004**	**0.1240**	**0.0327**	**7.4000e-004**	**0.0334**		**113.4098**	**113.4098**	**2.7700e-003**		**113.4792**

3.4 Building Construction - 2020

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	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.0631	2,553.0631	0.6229		2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**		**2,553.0631**	**2,553.0631**	**0.6229**		**2,568.6345**

3.4 Building Construction - 2020

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	7.9800e-003	0.2305	0.0622	5.4000e-004	0.0135	1.1400e-003	0.0147	3.9000e-003	1.0900e-003	4.9800e-003		56.8655	56.8655	3.1100e-003		56.9431
Worker	0.0294	0.0208	0.2016	6.1000e-004	0.0657	4.3000e-004	0.0661	0.0174	3.9000e-004	0.0178		60.4852	60.4852	1.4800e-003		60.5222
Total	**0.0374**	**0.2513**	**0.2638**	**1.1500e-003**	**0.0793**	**1.5700e-003**	**0.0808**	**0.0213**	**1.4800e-003**	**0.0228**		**117.3507**	**117.3507**	**4.5900e-003**		**117.4654**

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	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.0631	2,553.0631	0.6229		2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**	**0.0000**	**2,553.0631**	**2,553.0631**	**0.6229**		**2,568.6345**

3.4 Building Construction - 2020

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	7.9800e-003	0.2305	0.0622	5.4000e-004	0.0135	1.1400e-003	0.0147	3.9000e-003	1.0900e-003	4.9800e-003		56.8655	56.8655	3.1100e-003		56.9431
Worker	0.0294	0.0208	0.2016	6.1000e-004	0.0657	4.3000e-004	0.0661	0.0174	3.9000e-004	0.0178		60.4852	60.4852	1.4800e-003		60.5222
Total	**0.0374**	**0.2513**	**0.2638**	**1.1500e-003**	**0.0793**	**1.5700e-003**	**0.0808**	**0.0213**	**1.4800e-003**	**0.0228**		**117.3507**	**117.3507**	**4.5900e-003**		**117.4654**

3.4 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	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**

3.4 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	6.5700e-003	0.2085	0.0560	5.3000e-004	0.0135	4.6000e-004	0.0140	3.9000e-003	4.4000e-004	4.3400e-003		56.3254	56.3254	2.9300e-003		56.3988
Worker	0.0273	0.0186	0.1839	5.9000e-004	0.0657	4.1000e-004	0.0661	0.0174	3.8000e-004	0.0178		58.3629	58.3629	1.3200e-003		58.3960
Total	**0.0338**	**0.2270**	**0.2399**	**1.1200e-003**	**0.0793**	**8.7000e-004**	**0.0801**	**0.0213**	**8.2000e-004**	**0.0222**		**114.6884**	**114.6884**	**4.2500e-003**		**114.7947**

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**

3.4 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	6.5700e-003	0.2085	0.0560	5.3000e-004	0.0135	4.6000e-004	0.0140	3.9000e-003	4.4000e-004	4.3400e-003		56.3254	56.3254	2.9300e-003		56.3988
Worker	0.0273	0.0186	0.1839	5.9000e-004	0.0657	4.1000e-004	0.0661	0.0174	3.8000e-004	0.0178		58.3629	58.3629	1.3200e-003		58.3960
Total	**0.0338**	**0.2270**	**0.2399**	**1.1200e-003**	**0.0793**	**8.7000e-004**	**0.0801**	**0.0213**	**8.2000e-004**	**0.0222**		**114.6884**	**114.6884**	**4.2500e-003**		**114.7947**

3.5 Paving - 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	1.0940	10.8399	12.2603	0.0189		0.5788	0.5788		0.5342	0.5342		1,804.5523	1,804.5523	0.5670		1,818.7270
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0940**	**10.8399**	**12.2603**	**0.0189**		**0.5788**	**0.5788**		**0.5342**	**0.5342**		**1,804.5523**	**1,804.5523**	**0.5670**		**1,818.7270**

3.5 Paving - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0681	0.0464	0.4596	1.4600e-003	0.1643	1.0300e-003	0.1653	0.0436	9.5000e-004	0.0445		145.9073	145.9073	3.3000e-003		145.9899
Total	**0.0681**	**0.0464**	**0.4596**	**1.4600e-003**	**0.1643**	**1.0300e-003**	**0.1653**	**0.0436**	**9.5000e-004**	**0.0445**		**145.9073**	**145.9073**	**3.3000e-003**		**145.9899**

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	1.0940	10.8399	12.2603	0.0189		0.5788	0.5788		0.5342	0.5342	0.0000	1,804.5523	1,804.5523	0.5670		1,818.7270
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0940**	**10.8399**	**12.2603**	**0.0189**		**0.5788**	**0.5788**		**0.5342**	**0.5342**	**0.0000**	**1,804.5523**	**1,804.5523**	**0.5670**		**1,818.7270**

3.5 Paving - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0681	0.0464	0.4596	1.4600e-003	0.1643	1.0300e-003	0.1653	0.0436	9.5000e-004	0.0445		145.9073	145.9073	3.3000e-003		145.9899
Total	**0.0681**	**0.0464**	**0.4596**	**1.4600e-003**	**0.1643**	**1.0300e-003**	**0.1653**	**0.0436**	**9.5000e-004**	**0.0445**		**145.9073**	**145.9073**	**3.3000e-003**		**145.9899**

3.6 Architectural Coating - 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					
Archit. Coating	30.9734					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941		281.4481	281.4481	0.0193		281.9309
Total	**31.1923**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**		**281.4481**	**281.4481**	**0.0193**		**281.9309**

3.6 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	6.8100e-003	4.6400e-003	0.0460	1.5000e-004	0.0164	1.0000e-004	0.0165	4.3600e-003	1.0000e-004	4.4500e-003		14.5907	14.5907	3.3000e-004		14.5990
Total	**6.8100e-003**	**4.6400e-003**	**0.0460**	**1.5000e-004**	**0.0164**	**1.0000e-004**	**0.0165**	**4.3600e-003**	**1.0000e-004**	**4.4500e-003**		**14.5907**	**14.5907**	**3.3000e-004**		**14.5990**

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	30.9734					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941	0.0000	281.4481	281.4481	0.0193		281.9309
Total	**31.1923**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**	**0.0000**	**281.4481**	**281.4481**	**0.0193**		**281.9309**

3.6 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	6.8100e-003	4.6400e-003	0.0460	1.5000e-004	0.0164	1.0000e-004	0.0165	4.3600e-003	1.0000e-004	4.4500e-003		14.5907	14.5907	3.3000e-004		14.5990
Total	**6.8100e-003**	**4.6400e-003**	**0.0460**	**1.5000e-004**	**0.0164**	**1.0000e-004**	**0.0165**	**4.3600e-003**	**1.0000e-004**	**4.4500e-003**		**14.5907**	**14.5907**	**3.3000e-004**		**14.5990**

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	0.2949	1.4884	3.4963	0.0118	1.0698	0.0109	1.0806	0.2862	0.0102	0.2964		1,194.1267	1,194.1267	0.0457		1,195.2691
Unmitigated	0.2949	1.4884	3.4963	0.0118	1.0698	0.0109	1.0806	0.2862	0.0102	0.2964		1,194.1267	1,194.1267	0.0457		1,195.2691

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	207.68	218.02	189.64	477,119	477,119
Total	207.68	218.02	189.64	477,119	477,119

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	10.80	4.80	5.70	31.00	15.00	54.00	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	0.576985	0.039376	0.193723	0.112069	0.016317	0.005358	0.017943	0.025814	0.002614	0.002274	0.005874	0.000887	0.000768

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Percent of Electricity Use Generated with Renewable 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	0.0189	0.1615	0.0687	1.0300e-003		0.0131	0.0131		0.0131	0.0131		206.1022	206.1022	3.9500e-003	3.7800e-003	207.3269
NaturalGas Unmitigated	0.0189	0.1615	0.0687	1.0300e-003		0.0131	0.0131		0.0131	0.0131		206.1022	206.1022	3.9500e-003	3.7800e-003	207.3269

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	1751.87	0.0189	0.1615	0.0687	1.0300e-003		0.0131	0.0131		0.0131	0.0131		206.1022	206.1022	3.9500e-003	3.7800e-003	207.3269
Total		**0.0189**	**0.1615**	**0.0687**	**1.0300e-003**		**0.0131**	**0.0131**		**0.0131**	**0.0131**		**206.1022**	**206.1022**	**3.9500e-003**	**3.7800e-003**	**207.3269**

5.2 Energy by Land Use - NaturalGas

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	1.75187	0.0189	0.1615	0.0687	1.0300e-003		0.0131	0.0131		0.0131	0.0131		206.1022	206.1022	3.9500e-003	3.7800e-003	207.3269
Total		**0.0189**	**0.1615**	**0.0687**	**1.0300e-003**		**0.0131**	**0.0131**		**0.0131**	**0.0131**		**206.1022**	**206.1022**	**3.9500e-003**	**3.7800e-003**	**207.3269**

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	23.8541	0.4599	31.3033	0.0556		4.1796	4.1796		4.1796	4.1796	448.3235	139.1505	587.4740	0.5575	0.0316	610.8384
Unmitigated	23.8541	0.4599	31.3033	0.0556		4.1796	4.1796		4.1796	4.1796	448.3235	139.1505	587.4740	0.5575	0.0316	610.8384

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	0.1528					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.8474					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	22.7990	0.4390	29.4864	0.0555		4.1695	4.1695		4.1695	4.1695	448.3235	135.8824	584.2058	0.5543	0.0316	607.4915
Landscaping	0.0549	0.0210	1.8170	1.0000e-004		0.0100	0.0100		0.0100	0.0100		3.2682	3.2682	3.1500e-003		3.3470
Total	**23.8541**	**0.4600**	**31.3033**	**0.0556**		**4.1796**	**4.1796**		**4.1796**	**4.1796**	**448.3235**	**139.1505**	**587.4740**	**0.5575**	**0.0316**	**610.8384**

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	0.1528					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.8474					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	22.7990	0.4390	29.4864	0.0555		4.1695	4.1695		4.1695	4.1695	448.3235	135.8824	584.2058	0.5543	0.0316	607.4915
Landscaping	0.0549	0.0210	1.8170	1.0000e-004		0.0100	0.0100		0.0100	0.0100		3.2682	3.2682	3.1500e-003		3.3470
Total	**23.8541**	**0.4600**	**31.3033**	**0.0556**		**4.1796**	**4.1796**		**4.1796**	**4.1796**	**448.3235**	**139.1505**	**587.4740**	**0.5575**	**0.0316**	**610.8384**

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

APPENDIX B

PLANNING SURVEY REPORT

Application Form and Planning Survey Report

To Comply With and Receive Permit Coverage Under The East Contra Costa County Habitat Conservation Plan and Natural Community Conservation Plan

Please complete this application to apply for take authorization under the state and federal East Contra Costa County HCP/NCCP incidental take permits. The East Contra Costa County Habitat Conservancy ("Conservancy") or local jurisdiction (City of Brentwood, City of Clayton, City of Oakley, City of Pittsburg, and Contra Costa County) may request more information in order to deem the application complete.

I. PROJECT OVERVIEW

PROJECT INFORMATION	
PROJECT NAME: Oakley Road Housing Development- City of Oakley	
PROJECT TYPE: ☒ Residential ☐ Commercial ☐ Transportation ☐ Utility ☐ Other	
PROJECT DESCRIPTION (BRIEF): The proposed project is a 22-lot residential development at 2480 Oakley Road. A general plan amendment from Light Industrial to Single Family High (R-6 zone) will be required.	
PROJECT ADDRESS/LOCATION: 2480 Oakley Road, Oakley, California 94561	
PARCEL/PROJECT SIZE (ACRES): 4.60	
PROJECT APN(S): 037-100-043-1	
APPLICATION SUBMITTAL DATE:	**FINAL PSR DATE:** (City/County/Conservancy use)
LEAD PLANNER: Kenneth Strelo	
JURISDICTION: ☐ City of Brentwood ☐ City of Clayton ☒ City of Oakley ☐ City of Pittsburg ☐ Contra Costa County ☐ Participating Special Entity* *Participating Special Entities are organizations not subject to the authority of a local jurisdiction. Such organizations may include school districts, irrigation districts, transportation agencies, local park districts, geological hazard abatement districts, or other utilities or special districts that own land or provide public services.	
DEVELOPMENT FEE ZONE: ☒ Zone I ☐ Zone II ☐ Zone III ☐ Zone IV See figure 9-1 of the HCP/NCCP at www.cocohcp.org for a generalized development fee zone map. Detailed development fee zone maps by jurisdiction are available from the jurisdiction.	

PROJECT APPLICANT INFORMATION	
APPLICANT'S NAME: Gkw Architects, Inc.	
AUTHORIZED AGENT'S NAME AND TITLE: Gordon Wong	
PHONE NO.: (408) 628-1357	**APPLICANT'S E-MAIL:** gordonkwong@gkwarchitects.com
MAILING ADDRESS: 710 E McGlincy Lane Suite 109, Campbell, CA 95008	

BIOLOGIST INFORMATION[1]	
BIOLOGICAL/ENVIRONMENTAL FIRM: Gallaway Enterprises	
CONTACT NAME AND TITLE: Melissa Murphy COO/Senior Biologist	
PHONE NO.: (530) 332-9909	**CONTACT'S E-MAIL:** Melissa@gallawayenterprises.com
MAILING ADDRESS: 117 Meyers Street, Suite 120 Chico, California 95928	

[1] A USFWS/CDFW-approved biologist (project-specific) is required to conduct the surveys. Please submit biologist(s) approval request to the Conservancy.

II. PROJECT DETAILS

Please complete and/or provide the following attachments:

1) **Project Description**
   Attach as **Attachment A: Project Description**. Provide a detailed written description that concisely and completely describes the project and location. Include the following information:
   - All activities proposed for the site or project, including roads utilized, construction staging areas, and the installation of underground facilities, to ensure the entire project is covered by the HCP/NCCP permit
   - Proposed construction dates, including details on construction phases, if applicable
   - Reference a City/County application number for the project, if applicable
   - General Best Management Practices, if applicable
   - If the project will have temporary impacts, please provide a restoration plan describing how the site will be restored to pre-project conditions, including revegetation seed mixes or plantings and timing

2) **Project Vicinity Map**
   Provide a project vicinity map. Attach as **Figure 1** in **Attachment B: Figures**.

3) **Project Site Plans**
   Provide any project site plans for the project. Attach as **Figure 2** in **Attachment B: Figures**.

4) **CEQA Document**
   Indicate the status of CEQA documents prepared for the project. Provide additional comments below table if necessary.

Type of Document	Status	Date Completed
☐ Initial Study		
☐ Notice of Preparation		
☐ Draft EIR		
☐ Final EIR		
☐ Notice of Categorical Exemption		
☐ Notice of Statutory Exemption		
☐ Other (describe)		

III. EXISTING CONDITIONS AND IMPACTS

Please complete and/or provide the following attachments:

1) **Field-Verified Land Cover Map**[2]
   Attach a field-verified land cover map in **Attachment B: Figures** and label as **Figure 3**. The map should contain all land cover types present on-site overlaid on aerial/satellite imagery. Map colors for the land cover types should conform to the HCP/NCCP (see *Figure 3-3: Landcover in the Inventory Area* for land cover type legend).

2) **Photographs of the Project Site**
   Attach representative photos of the project site in **Attachment B: Figures** and label as **Figure 4**. Please provide captions for each photo.

[2] For PSEs and city or county public works projects, please also identify permanent and temporary impact areas by overlaying crosshatching (permanent impacts) and hatching (temporary impacts) on the land cover map.

3) Land Cover Types and Impacts and Supplemental Tables

- For all terrestrial land cover types please provide calculations to the nearest **hundredth of an acre (0.01)**. For aquatic land cover types please provide calculations to the nearest **thousandth of an acre (0.001)**.
- **Permanent Impacts** are broadly defined in the ECCC HCP/NCCP to include all areas removed from an undeveloped or habitat-providing state and includes land in the same parcel or project that is not developed, graded, physically altered, or directly affected in any way but is isolated from natural areas by the covered activity. Unless such undeveloped land is dedicated to the Preserve System or is a deed-restricted creek setback, the development mitigation fee will apply (if proposed, would require Conservancy approval).
- **Temporary Impacts** are broadly defined in the ECCC HCP/NCCP as any impact on vegetation or habitat that does not result in permanent habitat removal (i.e. vegetation can eventually recover).
- If **wetland (riparian woodland/scrub, wetland, or aquatic)** land cover types are present on the parcel but will not be impacted please discuss in the following section 4) Jurisdictional Wetlands and Waters. Wetland impact fees will only be charged if wetland features are impacted. However, development fees will apply to the entire parcel.
- **Stream** land cover type is considered a linear feature where impacts are calculated based on length impacted. The acreage within a stream, below Top of Bank (TOB), must be assigned to the adjacent land cover type(s). Insert area of impact to stream below TOB in parentheses after the Land Cover acreage number (e.g., Riparian Woodland/Scrub: 10 (0.036) – where 10 is the total impacted acreage <u>including</u> 0.036 acre, which is the acreage within stream TOB). Complete following supplemental **Stream Feature Detail** table to provide information for linear feet.
- **Total Impacts** acreage should be the <u>total parcel acreage</u> (development project) or <u>project footprint acreage</u> (rural infrastructure or utility project).

<u>Table 1: Land Cover Types and Impacts</u>

Land Cover Type	Permanent Impacts	Temporary Impacts	*Proposed for HCP/NCCP Dedication on the Parcel (Requires Conservancy Approval)* *Stream Setback*	*Preserve System Dedication*
Grassland				
Annual Grassland	N/A	N/A	N/A	N/A
Alkali Grassland	N/A	N/A	N/A	N/A
Ruderal	3.00	N/A	N/A	N/A
Shrubland				
Chaparral and Scrub	N/A	N/A	N/A	N/A
Woodland				
Oak Savannah	N/A	N/A	N/A	N/A
Oak Woodland	N/A	N/A	N/A	N/A
Riparian				
Riparian Woodland/Scrub	N/A	N/A	N/A	N/A
Wetland				
Permanent Wetland	N/A	N/A	N/A	N/A
Seasonal Wetland	N/A	N/A	N/A	N/A
Alkali Wetland	N/A	N/A	N/A	N/A
Aquatic				
Aquatic (Reservoir/Open Water)	N/A	N/A	N/A	N/A
Slough/Channel	N/A	N/A	N/A	N/A
Pond	N/A	N/A	N/A	N/A
Stream (in linear feet)	-	-	-	-
Irrigated Agriculture				
Pasture	N/A	N/A	N/A	N/A
Cropland	N/A	N/A	N/A	N/A
Orchard	N/A	N/A	N/A	N/A
Vineyard	N/A	N/A	N/A	N/A
Other				
Nonnative woodland	N/A	N/A	N/A	N/A
Wind turbines	N/A	N/A	N/A	N/A
Developed (not counted toward Fees)				
Urban	1.60	N/A	N/A	N/A
Aqueduct	N/A	N/A	N/A	N/A
Turf	N/A	N/A	N/A	N/A
Landfill	N/A	N/A	N/A	N/A
TOTAL IMPACTS	4.60	N/A	N/A	N/A

Identify any uncommon vegetation and uncommon landscape features[3]:

Supplemental to Table 1: Uncommon Vegetation and Landscape Features

	Permanent Impacts	Temporary Impacts
Uncommon Grassland Alliances		
Purple Needlegrass Grassland	N/A	N/A
Blue Wildrye Grassland	N/A	N/A
Creeping Ryegrass Grassland	N/A	N/A
Wildflower Fields	N/A	N/A
Squirreltail Grassland	N/A	N/A
One-sided Bluegrass Grassland	N/A	N/A
Serpentine Bunchgrass Grassland	N/A	N/A
Saltgrass Grassland	N/A	N/A
Alkali Sacaton Bunchgrass Grassland	N/A	N/A
☐ Other		
Uncommon Landscape Features		
Rock Outcrops	N/A	N/A
Caves	N/A	N/A
Springs and seeps	N/A	N/A
Scalds	N/A	N/A
Sand Deposits	N/A	N/A
☐ Mines[4]	N/A	N/A
☐ Buildings (bat roosts)[3]	N/A	N/A
☐ Potential nest sites (trees or cliffs)[3]	N/A	N/A

Please provide details of impacts to stream features:

Stream Name: N/A

Watershed: N/A

Supplemental to Table 1: Stream Feature Detail[5]

Stream Width	Stream Type[6]	Permanent Impacts (linear feet)[7]	Temporary Impacts (linear feet)[7]
☐ ≤ 25 feet wide ☐ > 25 feet wide	☐ Perennial ☐ Intermittent ☐ Ephemeral, 3rd or higher order ☐ Ephemeral, 1st or 2nd order		
☐ ≤ 25 feet wide ☐ > 25 feet wide	☐ Perennial ☐ Intermittent ☐ Ephemeral, 3rd or higher order ☐ Ephemeral, 1st or 2nd order		
☐ ≤ 25 feet wide ☐ > 25 feet wide	☐ Perennial ☐ Intermittent ☐ Ephemeral, 3rd or higher order ☐ Ephemeral, 1st or 2nd order		

[3] These acreages are for Conservancy tracking purposes. Impacts to these uncommon vegetation and landscape features should be accounted for within the land cover types in Table 1 (e.g., x acres of purple needlegrass in this supplemental table should be accounted for within annual grassland in Table 1).
[4] Insert amount/number, not acreage. Provide additional information on these features in Attachment A: Project Description.
[5] Use more than 1 row as necessary to describe impacts to streams on site.
[6] See glossary (Appendix A) for definition of stream type and order.
[7] Stream length is measured along stream centerline, based on length of impact to any part of the stream channel, TOB to TOB.

4) Summary of Land Cover Types

Please provide a written summary of descriptions for land cover types found on site including characteristic vegetation.

There are two land cover types, urban (1.60 acres) and ruderal (3.00 acres), within the biological study area (BSA). The land cover types are classified below in accordance with the HCP/NCCP (Chapter 3, Section 3.3.2), which described land cover types based on Jones & Stokes (1996), Mayer and Laudenslayer (1988, 1999), and the first edition of A Manual of California Vegetation (Sawyer and Keeler-Wolf 1995). Land cover types in the BSA are shown in **Figure 3**. Representative photographs are provided in **Figure 4**.

Ruderal. A majority of (approximately 3.00 acres) the BSA land cover is ruderal. This is due to the regular mowing and disking activities that disturb the site and its vegetation. Dominant vegetation on site was a mixture of nonnative annual grasses and weedy species, such as long-beaked stork's bill (*Erodium botrys*), radish (*Raphanus sativus*), and wall hare barley (*Hordeum murinum*).

Urban. The 1.60 acres of urban land occurs in the western portion of the BSA. Historic aerials show a fence line separating the urban area and the 3.00 acres of ruderal land originally typed in the HCP as vineyard. This portion of the site was presumably used by the occupants of the parcels to the west and contained sheds, farm equipment, orchard trees, and potentially livestock. This urban area currently has remnant orchard trees (almond trees (*Prunus dulcis)* and black walnut tree (*Juglans nigra))*, tree of heaven (*Ailanthus altissima*), and wood/metal materials from collapsed structures in the northwest corner of the BSA. The understory was consistent with that observed in the ruderal habitat.

5) Jurisdictional Wetlands and Waters

If wetlands and waters are present on the project site, project proponents must conduct a delineation of jurisdictional wetlands and waters. Jurisdictional wetlands and waters are defined on pages 1-18 and 1-19 of the ECCC HCP/NCCP as the following land cover types: permanent wetland, seasonal wetland, alkali wetland, aquatic, pond, slough/channel, and stream. It should be noted that these features differ for federal and state jurisdictions. If you have identified any of these land cover types in Table 1, complete the section below.

a) Attach the wetland delineation report as **Attachment E: Wetland Delineation.** If a wetland delineation has not been completed, please explain below in section 4c.

b) Please check the following permits the project may require. Please submit copies of these permits to the Conservancy prior to the start of construction:

☐ CWA Section 404 Permit[8] ☐ CWA Section 401 Water Quality Certification

☐ Waste Discharge Requirements ☐ Lake and Streambed Alteration Agreement

c) Provide any additional information on impacts to jurisdictional wetland and waters below, including status of the permit(s):

N/A, no wetlands or waters present in the project site.

[8] The USACE Sacramento District issued a Regional General Permit 1 (RGP) related to ECCC HCP/NCCP covered activities. The RGP is designed to streamline wetland permitting in the entire ECCC HCP/NCCP Plan Area by coordinating the avoidance, minimization, and mitigation measures in the Plan with the Corps' wetland permitting requirement. Applicants seeking authorization under this RGP shall notify the Corps in accordance with RGP general condition number 18 (Notification).

6) Species-Specific Planning Survey Requirements

Based on the land cover types found on-site and identified in Table 1, check the applicable boxes in Table 2a.

Table 2a. Species –Specific Planning Survey Requirements

Land Cover Type in Project Area	Required Survey Species	Habitat Element in Project Area	Planning Survey Requirement[9]	Info in HCP
☒ Grasslands, oak savannah, agriculture, or ruderal	☒ San Joaquin kit fox	Assumed if within modeled range of species	If within modeled range of species, identify and map potential breeding or denning habitat within the project site and a 250-ft radius around the project footprint.	pp. 6-37 to 6-38
	☒ Western burrowing owl	Assumed	Identify and map potential breeding habitat within the project site and a 500-ft radius around the project footprint. Please note the HCP requires buffers for occupied burrows. Surveys may need to encompass an area larger than the project footprint.	pp. 6-39 to 6-41
☐ Aquatic (ponds, wetlands, streams, sloughs, channels, and marshes)	☐ Giant garter snake	Aquatic habitat accessible from the San Joaquin River	Identify and map potential habitat.	pp. 6-43 to 6-45
	☐ California tiger salamander	Ponds and wetlands Vernal pools Reservoirs Small lakes	Identify and map potential breeding habitat. Document habitat quality and features. Provide the Conservancy with photo-documentation and report.	pp. 6-45
	☐ California red-legged frog	Slow-moving streams, ponds and wetlands	Identify and map potential breeding habitat. Document habitat quality and features. Provide the Conservancy with photo-documentation and report.	p. 6-46
	☐ Covered shrimp	Seasonal wetlands Vernal pools Sandstone rock outcrops Sandstone depressions	Identify and map potential habitat. Please note the HCP requires a 50 foot non-disturbance buffer from seasonal wetlands that may be occupied by covered shrimp. Surveys may need to encompass an area larger than the project footprint.	pp. 6-46 to 6-48
☒ Any	☐ Townsend's big-eared bat	Rock formations with caves Mines Abandoned buildings outside urban area	Map and document potential breeding or roosting habitat.	pp. 6-36 to 6-37
	☒ Swainson's hawk	Potential nest sites within 1,000 feet of project	Inspect large trees for presence of nest sites. Document and map.	pp. 6-41 to 6-43
	☒ Golden Eagle	Potential nest sites with ½ mile of project	Inspect large trees for presence of nest sites. Document and map.	pp. 6-38 to 6-39
Surveys for all covered species must be conducted by a qualified biologist (USFWS/CDFW project-specific approved). Please submit biologist approval request to the East Contra Costa County Habitat Conservancy. Surveys for all covered species must be conducted according to the respective USFWS or CDFW survey protocols, as identified in Chapter 6.4.3 in the HCP/NCCP.				

7) Planning Survey Species Habitat Maps

Provide Planning Survey Species Habitat Maps as required in Table 2a, attach as **Figure 5** in **Attachment B: Figures**.

- Figure 5 is not included in this application**.** The project site is not within the modeled range for any of the required survey species. There was no suitable habitat within the project site for the required survey species.

[9] The planning survey requirements in this table are not comprehensive. Please refer to Chapter 6.4.3 in the ECCC HCP/NCCP for more detail.

- San Joaquin kit fox: Project site is not within modeled range of species. There is no suitable denning or breeding habitat present with the project site.
- Western burrowing owl: Project site is not within modeled range of species. There is no suitable burrows or breeding habitat present with the project site.
- Swainson's hawk: Project site is not within modeled range of species. No suitable nesting trees within the project site.
- Golden Eagle: Project site is not within modeled range of species. No suitable nesting trees within the project site.

8) Results of Species Specific Surveys

Provide a written summary describing the results of the planning surveys. Please discuss the location, quantity, and quality of suitable habitat for specified covered wildlife species on the project site.

Prior to conducting fieldwork, Gallaway Enterprises (GE) searched the California Natural Diversity Database (CNDDB, CDFW 2019) for record of special-status species occurrences within the "Brentwood, Jersey Island, Antioch South and Antioch North" 7.5-minute United States Geological Survey (USGS) quadrangles near the BSA. Information regarding potentially occurring rare plants and listed species was obtained from the California Native Plant Society (CNPS) *Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2019). The Special-Status Species Proposed for Coverage in the ECCC HCP/NCCP, Vol. 1/ Table 3-8 and Vol. 2/ Appendix D were also referenced. Special-status species are defined as follows:

- Species that are listed, formally proposed, or designated as candidates for listing as threatened or endangered under the Endangered Species Act (ESA) of 1973;
- Species that are listed, or designated as candidates for listing, as rare, threatened, or endangered under the California Endangered Species Act (CESA);
- Plant species assigned California Tate Plant Tanks 1A, 1B, 2B, 3, and 4. In the CNPS Inventory of Rare and Endangered Vascular Plants of California (CNPS 2019)
- Animal species designated as Species of Special Concern or Fully Protected by the CDFW;
- Species that meet the definition of rare, threatened, or endangered under Section 15380 of the CEQA guidelines; and
- Species covered under the HCP/NCCP

Based on a review of the above sources and following a site reconnaissance on April 4, 2019, GE biologists were able to assess the potential for these species to occur within the BSA based on the presence of suitable habitat, the proximity of known species occurrences, and knowledge of species' range and/or mobility. Species requiring specific habitats not present in the BSA and project vicinity (i.e. aquatic habitat, chaparral and scrub land cover, or oak woodland/savanna land cover, buildings, caves or mine) were eliminated from consideration and not discussed further. Four (4) plant species and four (4) wildlife species warranted further consideration given the presence of marginal or suitable habitat in the BSA. No special-status species were observed within the BSA. The four (4) wildlife species with potential to occur at the site are briefly discussed below.

Further information detailing the methodology of the studies conducted is included below.

Survey Methods:

General Floral and Faunal Inventory, Plant Communities, Habitat Mapping, and Impact Assessment. Surveys within the BSA were conducted bu senior biologist, Melissa Murphy, and senior botanist, Elena Gregg on April 4, 2019. The purpose of the survey was to determine the locations of specific plant communities, map habitat types, and assess potential project impacts to habitats and special-statues species. During the survey, the BSA was traversed on foot in tight transects. The special-status species habitat assessment focused on listed plant and animal species known to occur in the project vicinity. A general floral and faunal inventory was also completed. Natural communities and land cover types were classified in accordance with the HCP/NCCP (Chapter 3, Section 3.3.2).

Species-specific Planning Surveys. Species-specific planning surveys were conducted for the following HCP/NCCP-covered species: San Joaquin kit fox (*Vulpes macrotis mutica*), western burrowing owl (*Athene cunicularia*), Swainson's hawk (*Buteo swainsoni*), and golden eagle (*Aquila chrysaetos*). These surveys were conducted in accordance with the requirements of Section 6.3.1 of the HCP/NCCP and focused on identifying and evaluating potentially suitable habitat

for the covered species and the presence of specific habitat features that could suggest past or current utilization by the species.

San Joaquin Kit Fox (SJKF). SJKF The closest occurrence (occurrence #21, 1995) of SJKF to is eight (8) miles away from the BSA. SJKF have been known to breed and forage in ruderal land-cover like that found within the BSA. However, the survey results indicated that the BSA does not provide suitable denning habitat and is unlikely to support foraging habitat given the lack of nearby occurrences. No mammal burrows or other features suitable for denning were observed in the BSA. The sandy loam soil type present did not appear stable enough to support a long-lasting burrow. There is no potential for SJKF to occur within the project site.

Western Burrowing Owl. In 2005, a pair and a single adult were found occupying winter burrows within a mile from the BSA (occurrence #947). Western burrowing owls have been known to breed and forage in ruderal land-cover; however, survey results indicated that the BSA does not provide suitable habitat. No mammal burrows or other features suitable for nesting or roosting were observed in the BSA and there were no signs of owls utilizing the site. The sandy loam soil type present did not appear stable enough to support a long-lasting burrow. There is no potential for western burrowing owls to occur within the project site.

Swainson's hawk. The CNDDB records show that there was a breeding pair of Swainson's hawks within a mile of the BSA in 2012 (occurrence #1799). The pair successfully fledged young from their 2011 nest. In 2012, they made several unsuccessful nesting attempts. The nesting trees were removed in 2012. Swainson's hawks may use ruderal land-cover like that found in the BSA to forage when they have an occupied nest nearby. No potential nesting trees were found within the BSA; however, there are suitable, currently unoccupied, nesting trees within 1,000 feet of the site.

Golden Eagle. There are no CNDDB occurrences of golden eagles within the Brentwood, Jersey Island, Antioch South or Antioch North 7.5-minute USGS quadrangles. Golden eagles are known to forage within ruderal land-cover like that found within the BSA. Although there are no suitable nesting trees or cliff faces within the BSA and no CNDDB occurrences nearby, suitable nest trees occur within ½ mile of the BSA.

9) Covered and No-Take Plants

Please check the applicable boxes in Table 2b based on the land cover types found in the project area. If suitable land cover types are present on site, surveys must be conducted using approved CDFW/USFWS methods during the appropriate season for identification of covered and no-take species (see page 6-9 of the ECCC HCP/NCCP). Reference populations of covered and no-take plants should be visited, where possible, prior to conducting surveys to confirm that the plant species is visible and detectable at the time surveys are conducted. In order to complete all the necessary covered and no-take plant surveys, spring, summer, and fall surveys may be required.

Table 2b. Covered and No-Take Plant Species

Plant Species	Covered (C) or No-Take (N)	Associated Land Cover Type	Typical Habitat or Physical Conditions, if Known	Typical Blooming Period	Suitable Land Cover Type Present
Adobe navarretia (*Navarretia nigelliformis* ssp. *radians*) [a]	C	Annual Grassland	Generally found on clay barrens in Annual Grassland [b]	Apr–Jun	☐ Yes ☒ No
Alkali milkvetch (*Astragalus tener* ssp. *tener*)	N	Alkali grassland Alkali wetland Annual grassland Seasonal wetland	Generally found in vernally moist habitat in soils with a slight to strongly elevated pH	Mar–Jun	☐ Yes ☒ No
Big tarplant (*Blepharizonia plumosa*)	C	Annual grassland	Elevation below 1500 feet [d] most often on Altamont Series or Complex soils	Jul–Oct	☐ Yes ☒ No
Brewer's dwarf flax (*Hesperolinon breweri*)	C	Annual grassland Chaparral and scrub Oak savanna Oak woodland	Generally, restricted to grassland areas within a 500+ buffer from oak woodland and/or chaparral/scrub [d]	May–Jul	☐ Yes ☒ No
Brittlescale (*Atriplex depressa*)	C	Alkali grassland Alkali wetland	Restricted to soils of the Pescadero or Solano soil series; generally found in southeastern region of plan area [d]	May–Oct	☐ Yes ☒ No
Caper-fruited tropidocarpum (*Tropidocarpum capparideum)*	N	Alkali grassland		Mar–Apr	☐ Yes ☒ No
Contra Costa goldfields (*Lasthenia conjugens*)	N	Alkali grassland Alkali wetland Annual grassland Seasonal wetland	Generally found in vernal pools	Mar–Jun	☐ Yes ☒ No
Diablo Helianthella (*Helianthella castanea*)	C	Chaparral and scrub Oak savanna Oak woodland	Elevations generally above 650 feet [d]	Mar–Jun	☐ Yes ☒ No
Diamond-petaled poppy (*Eschscholzia rhombipetala*)	N	Annual grassland		Mar–Apr	☒ Yes ☐ No
Large-flowered fiddleneck (*Amsinckia grandiflora*)	N	Annual grassland	Generally on clay soil	Apr–May	☒ Yes ☐ No
Mount Diablo buckwheat (*Eriogonum truncatum*)	N	Annual grassland Chaparral and scrub	Ecotone of grassland and chaparral/scrub	Apr–Sep	☐ Yes ☒ No
Mount Diablo fairy-lantern (*Calochortus pulchellus*)	C	Annual grassland Chaparral and scrub Oak savanna Oak woodland	Elevations generally between 650 and 2,600[d]	Apr–Jun	☐ Yes ☒ No
Mount Diablo Manzanita (*Arctostaphylos auriculata*)	C	Chaparral and scrub	Elevations generally between 700 and 1,860 feet; restricted to the eastern and northern flanks of Mt. Diablo [d] and the vicinity of Black Diamond Mines	Jan–Mar	☐ Yes ☒ No
Recurved larkspur (*Delphinium recurvatum*)	C	Alkali grassland Alkali wetland		Mar–Jun	☐ Yes ☒ No
Round-leaved filaree (*California macrophylla*) [c]	C	Annual grassland		Mar–May	☒ Yes ☐ No
San Joaquin spearscale (*Extriplex joaquiniana*) [e]	C	Alkali grassland Alkali wetland		Apr–Oct	☐ Yes ☒ No
Showy madia (*Madia radiata*)	C	Annual grassland Oak savanna Oak woodland	Primarily occupies open grassland or grassland on edge of oak woodland	Mar–May	☒ Yes ☐ No

[a] The species *Navarretia nigelliformis* subsp. *nigelliformis* is no longer considered to occur within Contra Costa County based on specimen annotations at the UC and Jepson Herbaria at the University of California Berkeley as well as the opinions of experts in the genus. This taxon is now recognized as *Navarretia nigelliformis* subsp. *radians.* Any subspecies of *Navarretia nigelliformis* encountered as a part of botanical surveys in support of a PSR should be considered as covered under this HCP/NCCP.

[b] Habitat for the *Navarretia nigelliformis* subspecies that occurs within the inventory are is inaccurately described in the HCP/NCCP as vernal pools. The entity within the Inventory generally occupies clay barrens within Annual Grassland habitat, which is an upland habitat type.

[c] From California Native Plant Society. 2007. *Inventory of Rare and Endangered Plants* (online edition, v7-07d). Sacramento, CA. Species may be identifiable outside of the typical blooming period; a professional botanist shall determine if a covered or no take plant occurs on the project site. Reference population of covered and no-take plants should be visited, where possible, prior to conducting surveys to confirm that the plant is visible and detectable at the time surveys are conducted.

[d] See Species Profiles in Appendix D of the Final HCP/NCCP. Reference populations of covered and no-take plants should be visited, where possible, prior to conducting surveys to confirm that the plant species is visible and detectable at the time surveys are conducted.

[e] In the recent update to the Jepson eflora (JFP 2013) *Atriplex joaquinana* has been circumscribed and segregated into a new genus called *Extriplex* based on the work of Elizabeth Zacharias and Bruce Baldwin (2010). The etymology of the genus *Extriplex* means, "beyond or outside Atriplex".

10) Results of Covered and No-Take Plant Species

Provide a written summary describing the results of the planning surveys conducted as required in Table 2b. Describe the methods used to survey the site for all covered and no-take plants, including the dates and times of all surveys conducted (see Tables 3-8 and 6-5 of the ECCC HCP/NCCP for covered and no-take plants), including reference populations visited prior to conducting surveys.

If any covered or no-take plant species were found, include the following information in the results summary:

- Description and number of occurrences and their rough population size.
- Description of the "health" of each occurrence, as defined on pages 5-49 and 5-50 of the HCP/NCCP.
- A map of all the occurrences.
- Justification of surveying time window, if outside of the plant's blooming period.
- The CNDDB form(s) submitted to CDFW (if this is a new occurrence).
- A description of the anticipated impacts that the covered activity will have on the occurrence and how the project will avoid impacts to all covered and no-take plant species. If impacts to covered plant species cannot be avoided and plants will be removed by covered activity, the Conservancy must be notified and has the option to salvage the covered plants. All projects must demonstrate avoidance of all six no-take plants (see table 6-5 of the HCP/NCCP).

Protocol Level Botanical Survey: On April 4, 2019, senior botanist, Elena Gregg, conducted a protocol level rare plant survey following the initial botanical habitat assessment during the appropriate blooming period for the four covered/no-take plant species that were identified as having potential to occur within the BSA. The four covered/no-take plant species that were identified as having potential to occur within the BSA were: large-flowered fiddleneck (*Amsinckia grandiflora*), diamond-petaled poppy (*Eschscholzia rhombipetala*), showy madia (*Madia radiata*), and round-leaved filaree (*California macrophlla*). These species are briefly discussed below. The survey was conducted in accordance with the CDFW March 2018, *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities*. All accessible areas within the project site were surveyed on foot. A Trimble Geo Explorer 6000 Series GPS Receiver was on hand to record any special-status plant occurrences observed. A list of plant species observed during the survey is included as **Attachment E**.

Botanical Survey Results: No covered/no-take species were observed during the protocol level survey.

IV. SPECIES-SPECIFIC AVOIDANCE AND MINIMIZATION REQUIREMENTS

Please complete and/or provide the following attachments:

1) Species-Specific Avoidance and Minimization for Selected Covered Wildlife

Complete the following table and check the applicable box for covered species determined by the planning surveys.

Table 3. Summary of Applicable Preconstruction Surveys, Avoidance and Minimization, and Construction Monitoring Requirements[10]

Species	Preconstruction Survey Requirements	Avoidance and Minimization Requirements	Construction Monitoring Required	Info in HCP
☐ San Joaquin kit fox	• On project footprint and 250-ft radius, map all dens (>5 in. diameter) and determine status • Provide written survey results to USFWS within 5 working days after surveying	• Monitor dens • Destroy unoccupied dens • Discourage use of occupied (non-natal) dens	• Establish exclusion zones (>50 ft for potential dens, and >100 ft for known dens) • Notify USFWS of occupied natal dens	pp. 6-37 to 6-38
☐ Western burrowing owl	• On project footprint and 500-ft radius, identify and map all owls and burrows, and determine status • Document use of habitat (e.g. breeding, foraging)	• Avoid occupied nests during breeding season (Feb-Sep) • Avoid occupied burrows during nonbreeding season (Sep – Feb) • Install one-way doors in occupied burrow (if avoidance not possible) • Monitor burrows with doors installed	• Establish buffer zones (250 ft around nests) • Establish buffer zones (160 ft around burrows)	pp. 6-39 to 6-41

[10] The requirements in this table are not comprehensive; they are detailed in the next section on the following page.

☐ Giant garter snake	• Delineate aquatic habitat up to 200 ft from water's edge on each side • Document any occurrences	• Limit construction to Oct-May • Dewater habitat April 15 – Sep 30 prior to construction • Minimize clearing for construction	• Delineate 200 ft buffer around potential habitat near construction • Provide field report on monitoring efforts • Stop construction activities if snake is encountered; allow snake to passively relocate • Remove temporary fill or debris from construction site • Mandatory training for construction personnel	pp. 6-43 to 6-45
☐ California tiger salamander	• Provide written notification to USFWS and CDFW regarding timing of construction and likelihood of occurrence on site	• Allow agency staff to translocate species, if requested	• None	p. 6-45
☐ California red-legged frog	• Provide written notification to USFWS and CDFW regarding timing of construction and likelihood of occurrence on site	• Allow agency staff to translocate species, if requested	• None	p. 6-46
☐ Covered shrimp	• Establish presence/absence • Document and evaluate use of all habitat features (e.g. vernal pools, rock outcrops)	• Establish buffer near construction activities • Prohibit incompatible activities	• Establish buffer around outer edge of all hydric vegetation associated with habitat (50 ft or immediate watershed, whichever is larger) • Mandatory training for construction personnel	pp. 6-46 to 6-48
☐ Townsend's big-eared bat	• Establish presence/absence • Determine if potential sites were recently occupied (guano)	• Seal hibernacula before Nov • Seal nursery sites before April • Delay construction near occupied sites until hibernation or nursery seasons are over	• None	pp. 6-36 to 6-37
☒ Swainson's hawk	• Determine whether potential nests are occupied	• No construction within 1,000 ft of occupied nests within breeding season (March 15 - Sep 15) • If necessary, remove active nest tree after nesting season to prevent occupancy in second year.	• Establish 1,000 ft buffer around active nest and monitor compliance (no activity within established buffer)	pp. 6-41 to 6-43
☒ Golden Eagle	• Establish presence/absence of nesting eagles	• No construction within ½ mile near active nests (most activity late Jan – Aug)	• Establish ½ mile buffer around active nest and monitor compliance with buffer	pp. 6-38 to 6-39

2) Required Preconstruction Surveys, Avoidance and Minimization, and Construction Monitoring

All preconstruction surveys shall be conducted in accordance with the requirements set forth in Section 6.4.3, Species-Level Measures, and Table 6-1 of the ECCC HCP/NCCP. Detailed descriptions of preconstruction surveys, avoidance and minimization, and construction monitoring applicable to each of the wildlife species in Table 3 are located below. Please remove the species-specific measures that do not apply to your project (highlight entire section and delete).

SWAINSON'S HAWK

Preconstruction Survey

Prior to any ground disturbance related to covered activities that occurs during the nesting season (March 15–September 15), a qualified biologist will conduct a preconstruction survey no more than 1 month prior to construction to establish whether Swainson's hawk nests within 1,000 feet of the project site are occupied. If potentially occupied nests within 1,000 feet are off the project site, then their occupancy will be determined by observation from public roads or by observations of Swainson's hawk activity (e.g., foraging) near the project site. If nests are occupied, minimization measures and construction monitoring are required (see below).

Avoidance and Minimization and Construction Monitoring

During the nesting season (March 15–September 15), covered activities within 1,000 feet of occupied nests or nests under construction will be prohibited to prevent nest abandonment. If site-specific conditions or the nature of the covered activity (e.g., steep topography, dense vegetation, and limited activities) indicate that a smaller buffer could be used, the Implementing Entity will coordinate with CDFW/USFWS to determine the appropriate buffer size.

If young fledge prior to September 15, covered activities can proceed normally. If the active nest site is shielded from view and noise from the project site by other development, topography, or other features, the project applicant can apply to the Implementing Entity for a waiver of this avoidance measure. Any waiver must also be approved by USFWS and CDFW. While the nest is occupied, activities outside the buffer can take place.

All active nest trees will be preserved on site, if feasible. Nest trees, including non-native trees, lost to covered activities will be mitigated by the project proponent according to the requirements below.

GOLDEN EAGLE

Preconstruction Survey

Prior to implementation of covered activities, a qualified biologist will conduct a preconstruction survey to establish whether nests of golden eagles are occupied (see Section 6.3.1, *Planning Surveys*). If nests are occupied, minimization requirements and construction monitoring will be required.

Avoidance and Minimization

Covered activities will be prohibited within 0.5 mile of active nests. Nests can be built and active at almost any time of the year, although mating and egg incubation occurs late January through August, with peak activity in March through July. If site-specific conditions or the nature of the covered activity (e.g., steep topography, dense vegetation, limited activities) indicate that a smaller buffer could be appropriate or that a larger buffer should be implemented, the Implementing Entity will coordinate with CDFW/USFWS to determine the appropriate buffer size.

Construction Monitoring

Construction monitoring will focus on ensuring that no covered activities occur within the buffer zone established around an active nest. Construction monitoring will ensure that direct effects to golden eagles are minimized.

3) Construction Monitoring Plan

Before implementing a covered activity, the applicant will develop and submit a construction monitoring plan to the planning department of the local land use jurisdiction and the East Contra Costa County Habitat Conservancy for review and approval. Elements of a brief construction monitoring plan will include the following:

- Results of planning and preconstruction surveys.[11]
- Description of avoidance and minimization measures to be implemented, including a description of project-specific refinements to the measures or additional measures not included in the HCP/NCCP.
- Description of monitoring activities, including monitoring frequency and duration, and specific activities to be monitored.
- Description of the onsite authority of the construction monitor to modify implementation of the activity.

☒ Check box to acknowledge this requirement.

V. SPECIFIC CONDITIONS ON COVERED ACTIVITIES

1) Check off the HCP conservation measures that apply to the project.

APPLIES TO ALL PROJECTS

☒ **Conservation Measure 1.11. Avoid Direct Impacts on Extremely Rare Plants, Fully Protected Wildlife Species, or Migratory Birds.** This conservation measure applies to all projects. All projects will avoid all impacts on extremely rare plants and fully protected species listed in Table 6-5 of the ECCC HCP/NCCP. See HCP pp. 6-23 to 6-25, and Table 6-5.

APPLIES TO PROJECTS THAT IMPACT COVERED PLANT SPECIES

☐ **Conservation Measure 3.10. Plant Salvage when Impacts are Unavoidable.** This condition applies to projects that cannot avoid impacts on covered plants and help protect covered plants by prescribing salvage whenever avoidance of impacts is not feasible. Project proponents wishing to remove populations of covered plants must notify the Conservancy of their construction schedule to allow the Conservancy the option of salvaging the populations. See HCP pp. 6-48 to 6-50.

APPLIES TO PROJECTS THAT INCLUDE ARE ADJACENT TO STREAMS, PONDS, OR WETLANDS

☐ **Conservation Measure 2.12. Wetland, Pond, and Stream Avoidance and Minimization.** All projects will implement measures described in the HCP to avoid and minimize impacts on wetlands, ponds, streams, and riparian woodland/scrub. See HCP pp. 6-33 to 6-35.

APPLIES TO NEW DEVELOPMENT PROJECTS

☒ **Conservation Measure 1.10. Maintain Hydrologic Conditions and Minimize Erosion.** All new development must avoid or minimize direct and indirect impacts on local hydrological conditions and erosion by incorporating the applicable Provision C.3 Amendments of the Contra Costa County Clean Water Program's (CCCCWP's) amended NPDES Permit (order no. R2-2003-0022; permit no. CAS002912). The overall goal of this measure is to ensure that new development covered under the HCP has no or minimal adverse effects on downstream fisheries to avoid take of fish listed under ESA or CESA. See HCP pp. 6-21 to 6-22.

APPLIES TO NEW DEVELOPMENT PROJECTS THAT INCLUDE OR ARE ADJACENT TO STREAMS, PONDS, OR WETLANDS

☐ **Conservation Measure 1.7. Establish Stream Setbacks.** A stream setback will be applied to all development projects covered by the HCP according to the stream types listed in Table 6-2 of the HCP. See HCP pp. 6-15 to 6-18 and Table 6-2.

APPLIES TO NEW DEVELOPMENT PROJECTS ADJACENT TO EXISTING PUBLIC OPEN SPACE, HCP PRESERVES, OR LIKELY HCP ACQUISITION SITES

☐ **Conservation Measure 1.6. Minimize Development Footprint Adjacent to Open Space.** Project applicants are encouraged to minimize their development footprint and set aside portions of their land to contribute to the HCP Preserve System. Land set aside that contributes to the HCP biological goals and objectives may be credited against development fees. See HCP pages 6-14 to 6-15.

☐ **Conservation Measure 1.8. Establish Fuel Management Buffer to Protect Preserves and Property.** Buffer zones will provide a buffer between development and wildlands that allows adequate fuel management to minimize the risk of wildlife damage to property or to the preserve. The minimum buffer zone for new development is 100 feet. See HCP pages 6-18 to 6-19.

☐ **Conservation Measure 1.9. Incorporate Urban-Wildlife Interface Design Elements.** These projects will incorporate design elements at the urban-wildlife interface to minimize the indirect impacts of development on the adjacent preserve. See HCP pp. 6-20 to 6-21.

[11] If the preconstruction surveys do not trigger construction monitoring, results of preconstruction surveys should still be submitted to the local jurisdiction and the East Contra Costa County Habitat Conservancy.

APPLIES TO ROAD MAINTENANCE PROJECTS OUTSIDE THE UDA

☐ **Conservation Measure 1.12. Implement Best Management Practices for Rural Road Maintenance.** Road maintenance activities have the potential to affect covered species by introducing sediment and other pollutants into downstream waterways, spreading invasive weeds, and disturbing breeding wildlife. In order to avoid and minimize these impacts, BMPs described in the HCP will be used where appropriate and feasible. See HCP pp. 6-25 to 6-26.

APPLIES TO NEW ROADS OR ROAD IMPROVEMENTS OUTSIDE THE UDA

☐ **Conservation Measure 1.14. Design Requirements for Covered Roads Outside the Urban Development Area (UDA).** New roads or road improvements outside the UDA have impacts on many covered species far beyond the direct impacts of their project footprints. To minimize the impacts of new, expanded, and improved roads in agricultural and natural areas of the inventory area, road and bridge construction projects will adopt siting, design, and construction requirements described in the HCP and listed in Table 6-6. See HCP pp. 6-27 to 6-33 and Table 6-6.

APPLIES TO FLOOD CONTROL MAINTENANCE ACTIVITIES

☐ **Conservation Measure 1.13. Implement Best Management Practices for Flood Control Facility Maintenance.** Flood control maintenance activities have the potential to affect covered species by introducing sediment and other pollutants into downstream waterways and disturbing breeding wildlife. In order to avoid and minimize these impacts, BMPs described in the HCP will be used where appropriate and feasible. See HCP pp. 6-26 to 6-27.

2) For all checked conservation measures, describe how the project will comply with each measure. Attach as Attachment C: Project Compliance to HCP Conditions.

VI. MITIGATION MEASURES

1) Mitigation Fee Calculator(s)
Complete and attach the fee calculator (use permanent and/or temporary impact fee calculator as appropriate), and attach as **Attachment D: Fee Calculator(s)**.

2) Briefly describe the amount of fees to be paid and when applicant plans to submit payment.

The applicant will pay a $50,272.95 development fee for permanently impacting 3.00 acres of ruderal habitat in Fee Zone 1. The applicant will submit payment before the start of the project.

Attachment A: Project Description

City/ County Application Number:

Anticipated Construction Date: unknown

Project Description:

Location. The proposed project site is located along Oakley Road in East Contra Costa County, approximately 0.1 mile east of Live Oak Avenue, 0.5 mile west of Main Street, and 0.3 mile north of Holly Creek Park (Figures 1 and 2). Specifically, the Project site falls within the Brentwood 7.5-minute United States Geological Survey (USGS) quadrangle and with the SE ¼ of Section 22, Township 02N, and Range 01E. The Project parcel is located at decimal degrees 37.99877, -121.7395. The Project lies with the East Contra Costa County Habitat Conservation Plan (ECCCHCP) and Natural Community Conservation Plan (NCCP) Inventory Area.

General Description. The City of Oakley proposes to establish a 22-lot residential development at 2480 Oakley Road, Oakley, California. A general plan amendment from Light Industrial to Single Family High (R-6 zone) will be required.

Specific Project Elements. The project will involve the following specific activities:

Tree and Vegetation Removal. Grouping of non-native trees on the west boundary of the project site will be removed. These trees consist of mostly trees of heaven, a few almond trees, and a single black walnut tree. The ruderal land-cover will also be removed from the project site.

Road Placement. A horse shoe shaped road will be placed within the project site to connect to residential lots with Oakley Road.

Installation of underground facilities. Underground utilities will be place within the project site.

Attachment B: Figures

NORTH

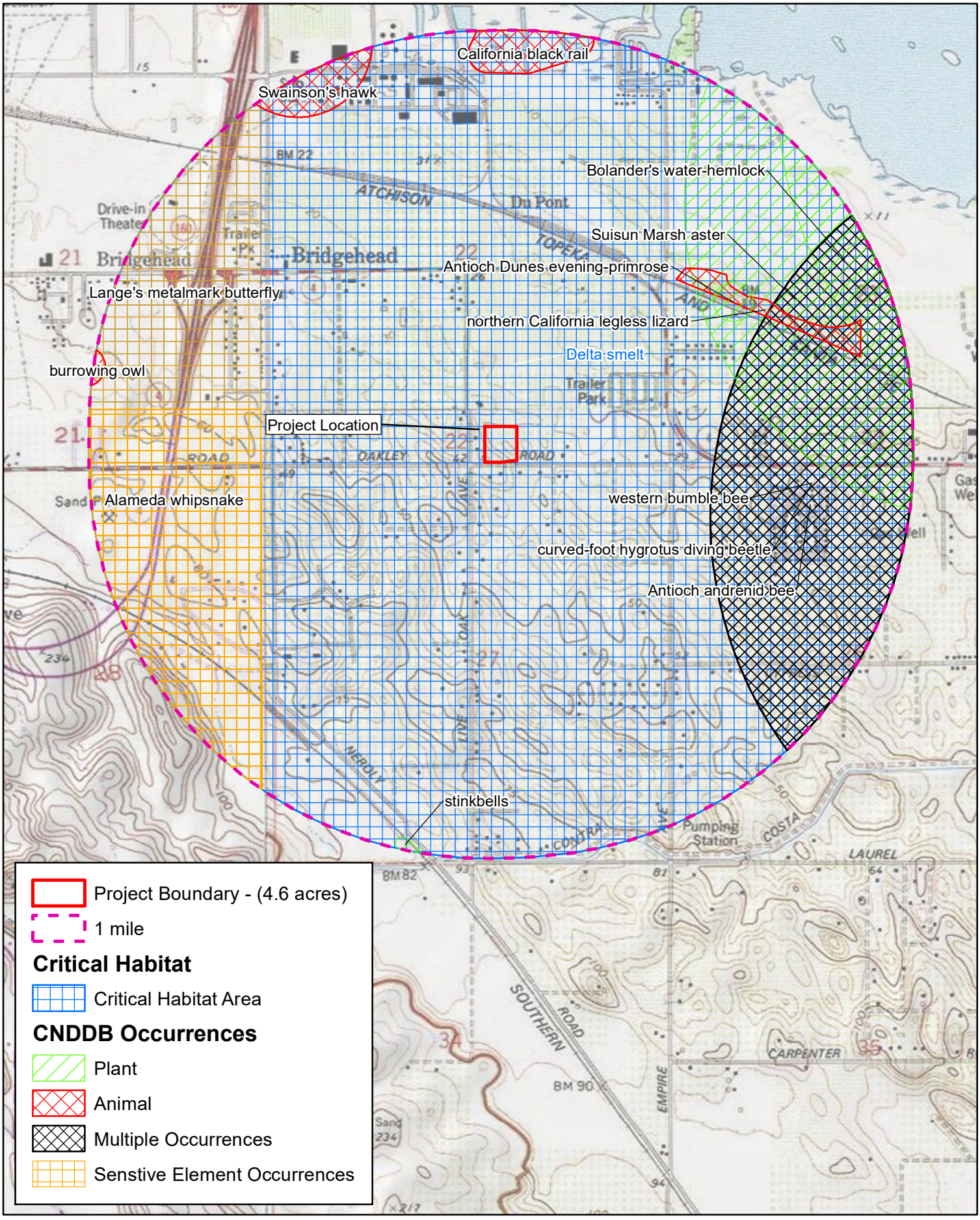
1:4,180
0 150 300 Feet

Data Sources: ESRI, Contra Costa County, DigitalGlobe 8/25/2017

Oakley Road Development
Regional Location
Figure 1

gallaway ENTERPRISES

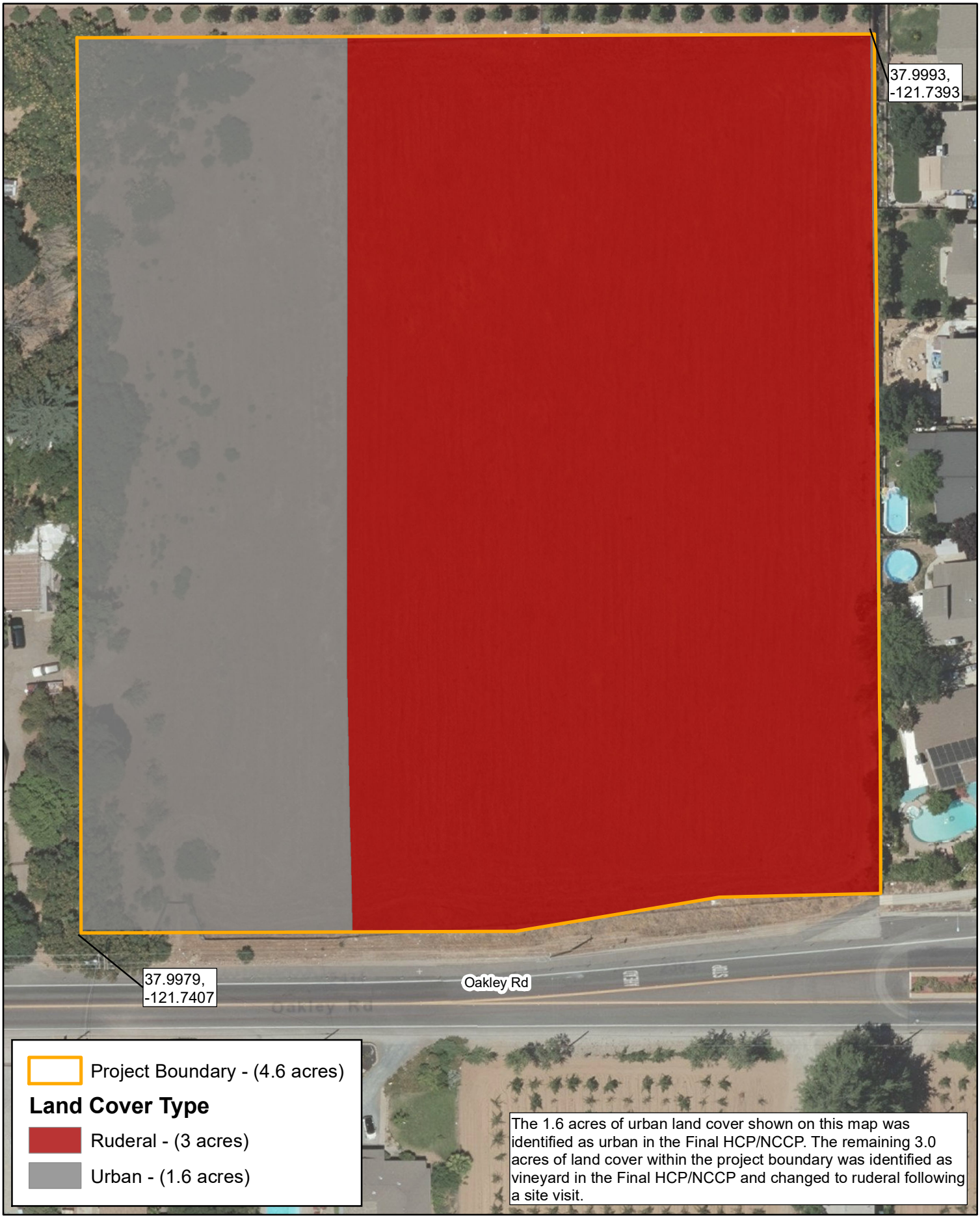
GEP: #19-045 Map Date: 4/08/19



Oakley Road Development
CNDDB Occurrences and Critical Habitat
Figure 2

gallaway ENTERPRISES

GEP: #19-045 Map Date: 4/08/19



NORTH

1:800
0 25 50 Feet

Data Sources: ESRI, Contra Costa County, DigitalGlobe 8/25/2017, GKW Architects

Oakley Road Development
Land Cover Map
Figure 3

gallaway ENTERPRISES

GEP: #19-045 Map Date: 4/18/19

Figure 4: Photographs of Project Site

Project site facing northeast from Oakley Road looking at the 3.0 acres of ruderal land cover.

Project site facing northwest from Oakley Road looking at the 3.0 acres of ruderal land cover.

Remnant urban habitat on the west boundary of the project site

Looking north at a portion of urban habitat on the northwest boundary of the project site

Attachment C: Project Compliance to HCP Conditions

For All Projects

Conservation Measure 1.11. Avoid Direct Impacts on Extremely Rare Plants, Fully Protected Wildlife Species, of Migratory Birds.

Plant species covered or addressed as no-take under the HCP were first evaluated for their potential to occur in the BSA based on the occurrence of suitable land cover types or specific required conditions. Protocol-level surveys were conducted in April 2019. No special-status plant species were found within the BSA during this survey.

Due to the types of land-cover present within the BSA, GE concluded that the following covered species (as defined under CESA, ESA, and MBTA) had the potential to occur in the BSA: San Joaquin kit fox, Western burrowing owl, Swainson's hawk, and golden eagle. The planning survey found that of these species, Swainson's hawk has the highest potential to occur within the project site. A pre-construction survey will be conducted and appropriate avoidance and minimization measures will be instituted to ensure protection of this species if they are found in the project area. There is low potential for the other three species to occur on the project site and, therefore, the proposed project is unlikely to affect these species.

All migratory birds, including those covered by the HCP, are also subject to the prohibition of the MBTA. The project will comply with the provisions of the MBTA and avoid any take of fully protected species through the adherence of the previously discussed avoidance and minimization measures for Swainson's hawk (preconstruction survey and construction monitoring) and the following additional avoidance measures:

1. To the extent feasible, vegetation removal activities shall not occur during the breeding season of February 15th through August 31st
2. If vegetation removal must occur during the breeding season, a qualified biologist shall be on site to verify the presence or absence of nesting birds.
3. Preconstruction surveys will be conducted no more than two weeks prior to the start of work from February 15th through August 31st.
4. If the survey indicates the potential presence of nesting birds, a buffer will be placed around the nest in which no work will be allowed until the young have successfully fledged. The size of the nest buffer will be determined by the biologist in consultation with the California Department of Fish and Wildlife (CDFW), and will be based to a large extent on the nesting species and its sensitivity to disturbance to birds nesting in an urban environment, but these buffers may be increased or decreased as appropriate, depending on the bird species and the level of disturbance anticipated near the nest.

For All New Development Projects

Conservation Measure 1.10. Maintain Hydrologic Conditions and Minimize Erosion.

The City of Oakley proposes to establish a 22-lot residential development within the project site. This will include the installation of a paved road. The following are Best Management Practices that the contractor will following in order to maintain hydrologic conditions and minimize erosion.

- The contractor will develop storm water treatment controls such as detention basins sized, at a minimum, to treat runoff in accordance with the criteria provided in the Provisions.
- The contactor will implement a verification program for treatment controls to ensure that all installed controls are being appropriately operated and maintained.

- The contactor will control peak runoff flows and volumes by means of creation and implementation of a Hydrograph Modification Management Plan subject to Provision requirements.
- The contactor will provide compensatory mitigation to the appropriate jurisdiction for projects where meeting Provision requirements are physically impractical.
- The contractor will limit the use of storm water controls that function primarily as infiltration devices in order to protect groundwater quality and local stream hydrograph.

Attachment D: Fee Calculator

ECCC HCP/NCCP 2019 Fee Calculator Worksheet
Permanent Impacts

PROJECT APPLICANT: Gkw Architects, Inc.

PROJECT NAME: Oakley Road Housing Development

APN(s): 037-100-043-1

JURISDICTION: City of Oakley

DATE:

DEVELOPMENT FEE

See appropriate ordinance or HCP/NCCP Figure 9-1 to determine Fee Zone

	ACREAGE PERMANENTLY IMPACTED (TABLE 1)[1]		2019 FEE PER ACRE (SUBJECT TO CHANGE)[2]		
Fee Zone 1	3.00	x	$16,757.65	=	$50,272.95
Fee Zone 2		x	$33,515.30	=	$0.00
Fee Zone 3		x	$8,379.53	=	$0.00
			Development Fee Total	=	**$50,272.95**

WETLAND MITIGATION FEE

	ACREAGE PERMANENTLY IMPACTED (TABLE 1)[1]		2019 FEE PER ACRE (SUBJECT TO CHANGE)[2]		
Riparian woodland / scrub		x	$82,222.77	=	$0.00
Perennial Wetland		x	$112,515.38	=	$0.00
Seasonal Wetland		x	$243,783.31	=	$0.00
Alkali Wetland		x	$230,800.77	=	$0.00
Ponds		x	$122,612.91	=	$0.00
Aquatic (open water)		x	$62,027.71	=	$0.00
Slough / Channel		x	$139,922.97	=	$0.00
STREAMS	**LINEAR FEET PERMANENTLY IMPACTED (TABLE 1)**		**2019 FEE PER LINEAR FT (SUBJECT TO CHANGE)[2]**		
Streams 25 feet wide or less		x	$670.34	=	$0.00
Streams greater than 25 feet wide		x	$1,009.75	=	$0.00
			Wetland Mitigation Fee Total	=	**$0.00**

FEE REDUCTION[3]

Development Fee reduction for land in lieu of fee	=	
Development Fee reduction (up to 33%) for permanent assessments	=	
Wetland Mitigation Fee reduction for wetland restoration/creation performed by applicant	=	
Reduction Total	=	**$0.00**

FINAL FEE CALCULATION

Development Fee Total		$50,272.95
Wetland Mitigation Fee Total	+	$0.00
Fee Subtotal	=	**$50,272.95**
Contribution to Recovery	+	
TOTAL AMOUNT TO BE PAID	=	**$50,272.95**

[1] City/County planning staff will consult the land cover map in the Final HCP/NCCP and will reduce the acreage subject to the Development Fee by the acreage of the subject property that was identified in the Final HCP/NCCP as urban, turf, landfill or aqueduct land cover.

[2] Development Fees are adjusted annually according to a formula that includes both a Home Price Index (HPI) and a Consumer Price Index (CPI). The Wetland Mitigation Fees are adjusted according to a CPI. The Conservancy conducted the 2013 periodic fee audit required by the HCP/NCCP. Action by the County and participating cities is pending, which could result in adjustments to some or all fees in 2019.

[3] Fee reductions must be reviewed and approved by the Conservancy.

Template date: March 12, 2019

Attachment E: Observed Plant and Wildlife Species

Plant Species Observed Within the Oakley Road Project Site April 4, 2019	
Scientific Name	**Common Name**
Ailanthus altissima	Tree-of-heaven
Amsinkia eastwoodiae	Eastwood's fiddleneck
Avena fatua	Wild oats
Bromus diandrus	Rip-gut brome
Camissonia contorta	Contorted sun cup
Cirsium vulgare	Bull thistle
Claytonia perfoliata	Miner's lettuce
Crassula tillaea	Moss pygmyweed
Erodium botrys	Long-beaked stork's-bill
Erodium cicutarum	Cut-leaf filaree
Festuca bromoides	Six-weeks fescue
Festuca myuros	Rattail fescue
Galium aparine	Bedstraw
Heterotheca sessiliflora	Golden aster
Hordeum murinum	Wall hare barley
Juglans hindsii	Black walnut
Lupinus bicolor	Annual lupine
Medicago praecox	Mediterranean bur-clover
Olea europaea	Olive
Oxalis pes-caprae	Bermuda buttercup
Pisum sativum	Garden pea
Prunus sp.	Cherry/plum
Prunus dulcis	Almond
Raphanus sativus	Radish
Salsola tragus	Tumbleweed
Spergula arvensis	Cornspurry
Stellaria media	Common chickweed
Trifolium hirtum	Rose clover
Vicia sativa	Garden vetch

Wildlife Species Observed Within the Oakley Road Project Site April 4, 2019	
Scientific Name	**Common Name**
Zonotrichia leucophrys	White-crowned sparrow
Setophaga coronata	Yellow-rumped warbler
Aphelocoma californica	California scrub-jay
Sayornis nigricans	Black phoebe
Streptopelia decaocto	Eurasian collared dove
Buteo lineatus	Red-shouldered hawk
Corvus brachyrhynchos	American crow

APPENDIX C

GEOTECHNICAL ENGINEERING STUDY

GEO-ENGINEERING SOLUTIONS, INC.
A PEI COMPANY
Geotechnical Engineering • Engineering Geology • Materials Testing

GEOTECHNICAL ENGINEERING STUDY

Oakley Subdivision
2480 Oakley Road, Oakley, CA 94561
August 27, 2018

Prepared for:

GKW Architects
710 E McGlincy Lane, #109
Campbell, California 95008

By:

Geo-Engineering Solutions, Inc.
2570 San Ramon Valley Blvd, Suite #A102
San Ramon, California 94583
Project No. 11-1062

GEO-ENGINEERING SOLUTIONS, INC.
2570 San Ramon Valley Blvd., Suite A102
San Ramon, CA | 925-433-0450

August 27, 2018

GKW Architects
710 E McGlincy Lane, #109
Campbell, California 95008

Attention: Mr. Gordon Wong

Subject: Geotechnical Engineering Study
Oakley Subdivision
2480 Oakley Road
Oakley, California 94561
Geo-Eng Project No. 11-1062

Dear Mr. Wong:

Geo-Engineering Solutions, Inc. has prepared a Geotechnical Engineering Study for the proposed 22-lot subdivision located at 2480 Oakley Road in Oakley, California. The new development will consist of single family residential units with new streets and utilities. Grading is anticipated to be relatively minor with cuts and fills on the order of 2 to 3 feet to develop grades and provide site drainage.

Transmitted herewith are the results of our findings, conclusions, and recommendations for the design and construction of proposed foundation support, interior concrete slabs, site development/grading and drainage, and utility trench backfilling. In general, the proposed improvements at the site are considered to be geotechnically feasible provided the recommendations of this report are implemented in the design and construction of the project.

Should you or members of the design team have questions or need additional information, please contact the undersigned at (925) 433-0450 or by e-mail at eswenson@geo-eng.net. We greatly appreciate the opportunity to be of service to GKW Architects, and to be involved in the design of this project.

Sincerely,

GEO-ENGINEERING SOLUTIONS, INC.

Colin Frost, PE
Project Engineer

Eric J. Swenson, GE, CEG
Principal Engineer and Geologist

GEO-ENGINEERING SOLUTIONS, INC.
A PEI COMPANY
Geotechnical Engineering • Engineering Geology • Materials Testing

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GEO-ENGINEERING SOLUTIONS, INC.
A PEI COMPANY
Geotechnical Engineering • Engineering Geology • Materials Testing

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APPENDIX B

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GEO-ENGINEERING SOLUTIONS, INC.
A PEI COMPANY
Geotechnical Engineering • Engineering Geology • Materials Testing

GEOTECHNICAL ENGINEERING STUDY

Project: **Oakley Subdivision**
2480 Oakley Road
Oakley, California 94561

Client: **GKW Architects**
Campbell, California

1.0 INTRODUCTION

1.1 Purpose and Scope

The purpose of our work was to prepare a Geotechnical Engineering Study, evaluate the subsurface conditions at the site and prepare geotechnical recommendations for the proposed development. We have provided specific recommendations regarding suitability and geotechnical concerns relative to the proposed structural design.

The scope of this study included the field exploration, laboratory testing, engineering analysis of the collected samples and test results, and preparation of this report. The conclusions and recommendations presented in this report are based on the limited samples collected and analyzed during this study, and on prudent engineering judgment and experience. This study did not include an in-depth assessment of potentially toxic or hazardous materials that may be present on or beneath the site.

1.2 Site Description

The proposed improvement project is located at 2480 Oakley Road in Oakley, California. The project site is bordered by Oakley Road to the south, neighboring residential developments to the west and east, and by Live Oak Elementary School to the north. The project site is an undeveloped rectangular parcel with an approximate area of 4.6 acres. The topography of the site is generally flat, with a gentle slope downwards from west to east; the site has an approximate elevation high of +42 in the southwest corner of the property and an approximate elevation low of 28 in the southeast, based off Google Earth elevations.

1.3 Proposed Development

Based on proposed architectural plans provided by the client and as shown on *Figure 2, Development Site Plan*, we understand that the development will consist of the construction of a new 22-lot subdivision for single-family residential structures. The 22 lots will be located throughout the entire property and will be accessed via a court that will connect to Oakley Road in two locations. The proposed single family residential structures will have two-

stories and have approximate areas ranging between 6,000 square feet and 7,067 square feet. It is assumed there will be associated site improvements such as site grading, paving, utilities, and landscaping.

1.4 Validity of Report

This report is valid for three years after publication. If construction begins after this time, Geo-Eng should be contacted to confirm that the site conditions have not changed significantly. If the proposed development differs considerably from that described above, Geo-Eng should be notified to determine if additional recommendations are required. Additionally, if Geo-Eng is not involved during the geotechnical aspects of construction, this report may become wholly or in part invalid; since Geo-Eng's geotechnical personnel need to verify that the subsurface conditions anticipated preparing this report are similar to the subsurface conditions revealed during construction. Geo-Eng's involvement should include foundation and grading plan review; observation of foundation excavations; grading observation and testing; testing of utility trench backfills.

2.0 PROCEDURES AND RESULTS

2.1 Literature Review

Pertinent geologic and geotechnical literature pertaining to the site area, and previous geotechnical studies performed by others for projects in the site vicinity were reviewed. These included United States Geological Survey (USGS), California Geological Survey (CGS), and other online resources, and other applicable government and private publications and maps, as included in the References section.

2.2 Field Exploration

A total of five borings were drilled at the site at the locations shown on Figure 3*, Site Plan and Site Geology Map*. The borings were drilled maximum depth of 30 feet below ground surface. The borings were drilled using a truck mounted B-24 drill rig equipped with a four-inch diameter, solid flight auger.

A Geo-Eng staff geotechnical engineer visually classified the materials encountered in the borings in general accordance with the Unified Soil Classification System as the borings were advanced. Relatively undisturbed soil samples were recovered at selected intervals using a three-inch outside diameter Modified California split spoon sampler containing six-inch long brass liners. A two-inch outside diameter Standard Penetration Test (SPT) sampler was used to obtain SPT blow counts and obtain disturbed soil samples. The samplers were driven by using a 140-pound wireline hammer with an approximate 30-inch fall utilizing N-rods as necessary. Resistance to penetration was recorded in the field as the number of hammer blows required to drive the sampler the final foot of an 18-inch drive. Following the completion of drilling, the boreholes were backfilled using cement grout.

For reporting purposes, all of the blow counts recorded using Modified California (MC) split spoon samplers in the field were subsequently converted to equivalent SPT blow counts using appropriate modification factors suggested by Burmister (1948); i.e., multiplied by a factor of 0.65 assuming a liner sample with an inner diameter of 2.5 inches. Therefore, all blow counts shown on the final boring logs are either directly measured (SPT sampler) or equivalent SPT (MC sampler) blow counts.

The boring logs with descriptions of the various materials encountered in each boring, the penetration resistance values, and some of the laboratory test results are presented in Appendix A. The ground surface elevations indicated on the soil boring logs are approximate (rounded to the nearest foot) and were estimated using elevations inferred from the Google Earth application.

2.3 Laboratory Testing

Laboratory tests were performed on selected samples to determine some of the physical and engineering properties of the subsurface soils. The results of the laboratory testing are presented on the boring logs, and included in Appendix B. The following soil tests were performed for this study:

Dry Density and Moisture Content (ASTM D2216 and ASTM 2937) – In-situ dry density and/or moisture tests were conducted on various samples to measure the in-place dry density and moisture content of the subsurface materials. These properties provide information to assist in evaluating the physical characteristics of the subsurface soils. Test results are shown on the boring logs.

Particle Size Analysis (Wet and Dry Sieve) and Fines Content (ASTM D422 and D1140) - Sieve analysis or fines content (minus No. 200 sieve) tests were conducted on several selected samples to measure the soil particle size distribution. This information is useful for the evaluation of liquefaction potential and characterizing the soil type according to USCS. Test results are presented on the boring logs or in Appendix B.

Soil Corrosivity, Redox (ASTM D1498), pH (ASTM D4972), Resistivity (ASTM G57), Chloride (ASTM D4327), and Sulfate (ASTM D4327) – Soil corrosivity testing was performed to determine the effects of constituents in the soil on buried steel and concrete. Water-soluble sulfate testing is required by the CBC and IBC. Test results are presented in Appendix B and discussed in Section 4.3.

3.0 GEOLOGY AND SEISMICITY

3.1 Geologic Setting

The site is located within the central portion of the Coast Ranges geomorphic province of California. The Coast Ranges geomorphic province consists of numerous small to moderate linear mountain ranges trending north to south and northwest to southeast. The Coast Ranges lies between the Pacific Ocean to the west and the Great Valley Geomorphic Province to the east. This province is approximately 400 miles long and extends from the Klamath Mountains in the north to the Santa Ynez River within Santa Barbara County in the south. It generally consists of marine sedimentary rocks and volcanic rocks. The province is characterized by northwest-trending faults and folds, as well as erosion and deposition within the broad transform boundary between the North American and Pacific plates. Translational motion along the plate boundary occurs across a distributed zone of right-lateral shear expressed as a nearly 50-mile-wide zone of northwest-trending, near-vertical active strike-slip faults. This motion occurs primarily along the active San Andreas, Hayward, Calaveras and San Gregorio faults.

The site is located southeast of Suisun Bay near the confluence of the Sacramento River and San Joaquin River. This area is dominated by Eolian (windblown) deposits of sand that are mapped as the upper member of the Modesto Formation (Atwater, 1982). These Pleistocene aged soil deposits are loose to medium dense fine-grained sands that overly the alluvial lower members of the Modesto Formation in the Oakley area. Holocene aged alluvial deposits are found north of the site closer to the San Joaquin River.

3.2 Seismic Setting

Regional transpression has caused uplift and folding of the bedrock units within the Coast Ranges. This structural deformation occurred during periods of tectonic activity that began in the Pliocene and continues today. The Bay Area of Northern California is a seismically active region dominated by four major northwest trending right lateral strike slip faults that include the San Andreas Fault, the Hayward Fault, the Calaveras Fault, and the Greenville Fault.

Major faults near the subject property include the Concord-Green Valley Fault located about ten miles to the west, the Hayward Fault located about 28 miles to the west, the Calaveras Fault located about 20 miles to the southwest, and the San Andreas Fault located about 47 miles to the west. Additional notable faults near the subject property include the Contra Costa Shear Zone located about 1.5 miles to the west and the Franklin Fault located about four miles to the west.

The subject property is not mapped within a State of California Special Studies Zones map. The closest active fault zone mapped in a Special Studies Zones map is the Green Valley-Concord Fault located about ten miles east of the subject property.

4.0 FIELD AND LABORATORY FINDINGS

Subsurface conditions below the project site were interpreted based on the results of the test borings performed for this study, as well as the results of our laboratory testing. Detailed descriptions of the various subsurface soil units encountered during subsurface explorations are described in the following paragraphs.

4.1 Subsurface Soil Conditions

Subsurface conditions below the project site were interpreted based on the results of our test borings performed for this study (see Figures 2 or 3 for locations) and the results of our laboratory testing. Detailed descriptions of the various subsurface soil units encountered during subsurface explorations are described in the following paragraphs.

During our subsurface exploration program, we investigated the subsurface soils in three borings and evaluated soil conditions to a maximum depth of 30 feet for this study. From the ground surface to the maximum depth explored, the soils underlying the project site consist primarily of a layer of loose to medium dense poorly graded sand and silty sand to an approximate depth between 12 feet to 20 feet, underlain by a layer of very stiff to hard sandy silt to the maximum depth explored of 30 feet below existing ground surface.

The near surface soils observed generally consisted of non-plastic granular material. We did not encounter any potentially expansive soil.

A geological cross section through the proposed development area is presented in *Figure 6, Schematic Geologic Cross Section A-A'*.

4.2 Groundwater

Groundwater was encountered in boring B-3 at an approximate depth of 20 feet below ground surface. The borings were backfilled with a neat cement grout shortly after drilling. We note that the borings may not have been left open for a sufficient period of time to establish equilibrium groundwater conditions.

Based on the Seismic Hazard Report for the Brentwood Quadrangle prepared by the California Geologic Survey (CGS) historic high groundwater in the area of the proposed development is on the order of 20 feet below ground surface, which is consistent with our findings. Groundwater levels can vary in response to time of year, variations in seasonal rainfall, tidal influence, well pumping, irrigation, and alterations to site drainage.

4.3 Corrosion Testing

A bulk sample collected from the upper one to three feet of Boring B-2 was tested to measure sulfate content, chloride content, redox potential, pH, resistivity, and presence of sulfides. Test results are included in Appendix B and are summarized on the following tables.

Table 1: Summary of Corrosion Test Results

Soil Description	Sample Depth (feet)	Sulfate (mg/kg)	Chloride (mg/kg)	Redox (mV)	Resistivity (ohm-cm)	Sulfide	pH
Reddish Brown Silty SAND	1-3	40	<2	502	30,044	Negative	6.9

Water-soluble sulfate can affect the concrete mix design for concrete in contact with the ground, such as shallow foundations, piles, piers, and concrete slabs. Section 4.3 in American Concrete Institute (ACI) 318, as referenced by the CBC, provides the following evaluation criteria:

Table 2: Sulfate Evaluation Criteria

Sulfate Exposure	Water-Soluble Sulfate in Soil, Percentage by Weight or (mg/kg)	Sulfate in Water, ppm	Cement Type	Max. Water Cementitious Ratio by Weight	Min. Unconfined Compressive Strength, psi
Negligible	0.00-0.10 (0-1,000)	0-150	NA	NA	NA
Moderate	0.10-0.20 (1,000-2,000)	150-1,500	II, IP (MS), IS (MS)	0.50	4,000
Severe	0.20-2.00 (2,000-20,000)	1,500-10,000	V	0.45	4,500
Very Severe	Over 2.00 (20,000)	Over 10,000	V plus pozzolan	0.45	4,500

The water-soluble sulfate content was measured to be about 40 mg/kg (ppm) or 0.0040% by dry weight in the soil sample, suggesting the site soil should have negligible impact on buried concrete structures at the site. However, it should be pointed out that the water-soluble sulfate concentrations can vary due to the addition of fertilizer, irrigation, and other possible development activities.

Table 4.4.1 in ACI 318 suggests use of mitigation measures to protect reinforcing steel from corrosion where chloride ion contents are above 0.06% by dry weight. The chloride content was measured to be <2 mg/kg (ppm) or <0.0002% by dry weight in the soil sample. Therefore, the test result for chloride content does not suggest a corrosion hazard for mortar-coated steel and reinforced concrete structures due to high concentration of chloride.

In addition to sulfate and chloride contents described above, pH, oxidation reduction potential (Redox), and resistivity values were measured in the soil sample. For cast and ductile iron pipes, an evaluation was based on the 10-Point scaling method developed by the Cast Iron Pipe Research Association (CIPRA) and as detailed in Appendix A of the American Water Works Association (AWWA) publication C-105 and shown on Table 3.

Table 3: Soil Test Evaluation Criteria (AWWA C-105)

Soil Characteristics	Points		Soil Characteristics	Points
Resistivity, ohm-cm, based on single probe or water-saturated soil box.			**Redox Potential, mV**	
<700	10		>+100	0
700-1,000	8		+50 to +100	3.5
1,000-1,200	5		0 to 50	4
1,200-1,500	2		Negative	5
1,500-2,000	1		**Sulfides**	
>2,000	0		Positive	3.5
PH			Trace	2
0-2	5		Negative	0
2-4	3		**Moisture**	
4-6.5	0		Poor drainage, continuously wet	2
6.5-7.5	0		Fair drainage, generally moist	1
7.5-8.5	0		Good drainage, generally dry	0
>8.5	5			

Assuming fair site drainage, the tested soil sample had a total score of 1 points, indicating a negligible corrosive rating. When total points on the AWWA corrosivity scale are at least 10, the soil is classified as corrosive to cast and ductile iron pipe and use of cathodic corrosion protection is often recommended.

These results are preliminary and provide information only on the specific soil sampled and tested. Other soil at the site may be more or less corrosive. Providing a complete assessment of the corrosion potential of the site soils are not within our scope of work. For specific long-term corrosion control design recommendations, we recommend that a California-registered professional corrosion engineer evaluate the corrosion potential of the soil environment on buried concrete structures, steel pipe coated with cement-mortar, and ferrous metals.

5.0 GEOLOGIC HAZARDS

5.1 Seismic Induced Hazards

Seismic hazards resulting from the effects of an earthquake generally include ground shaking, liquefaction and dynamic settlement (compaction), lateral spreading, fault ground rupture and fault creep, and tsunamis and seiches. The site is not necessarily impacted by these potential seismic hazards. Applicable potential seismic hazards are discussed and evaluated in the following sections in relation to the planned construction.

5.1.1 Ground Shaking

The site will likely experience severe ground shaking from a major earthquake originating from many significant faults in the San Francisco Bay Area, including the Hayward, Calaveras, San Andreas and Concord-Green Valley faults. Earthquake intensities vary throughout the Bay Area depending upon the magnitude of the earthquake, the distance of the site from the causative fault, the type of materials underlying the site and other factors.

In addition to shaking of the structure, strong ground shaking can induce other related phenomena that may influence structures, such as liquefaction or dynamic compaction settlement; adjacent seismic slope failure, lurching or lateral spreading, or seismically induced waves (tsunamis and seiches).

5.1.2 Liquefaction Induced Phenomena and Dynamic Compaction

Research and historical data indicate that soil liquefaction generally occurs in saturated, loose granular soil (primarily fine to medium-grained, clean, poorly-graded sand deposits) during or after strong seismic ground shaking and is typified by a loss of shear strength in the affected soil layer, thereby causing the soil to flow as a liquid. Typically, liquefaction potential increases with increased duration and magnitude of cyclic loading. However, because of the higher intergranular pressure of the soil at greater depths, the potential for liquefaction is generally limited to the upper 40 feet of the soil. Potential hazards associated with soil liquefaction below or near a structure include loss of foundation support, lateral spreading, sand boils, and areal and differential settlement.

Dynamic compaction (dry sand settlement) is a phenomenon where loose, relatively clean, near-surface sandy soil located above the ground water table is densified from vibratory loading, typically from strong seismic shaking or vibratory equipment. The site soils above the ground water table depth of 20 feet generally consist of loose to medium dense poorly graded sand and silty sand. To evaluate the potential impact of dynamic compaction

Lateral spreading is lateral ground movement, with some vertical component, as a result of liquefaction. The soil literally rides on top of the liquefied layer. Lateral spreading can occur on relatively flat sites with slopes less than two percent under certain circumstances, generally when the liquefied layer is in relatively close proximity to an open, free slope face such as the bank of a creek channel. Lateral spreading can cause surficial ground tension cracking (i.e., lurch cracking) and settlement.

The Seismic Hazard Zone map for the Brentwood Quadrangle, prepared by CGS, indicates the project to be within a zone of required investigation for liquefaction, as shown in *Figure 7 – Seismic Hazard and AP Fault Zone Map*. We performed liquefaction analysis to estimate the potential seismic settlement at the site that could occur as a result of the design earthquake occurring on the nearby Hayward Fault.

Our methodology of liquefaction evaluation essentially followed the proceedings from the NCEER workshop on liquefaction (Youd and Idriss, 2001) and CGS Special Publication 117A (2008). This methodology compares a critical Cyclic Shear Stress (CSR) against the field Cyclic Resistance Ratio (CRR). When the CSR exceeds the CRR, the factor-of-safety falls below 1.0 and liquefaction can occur.

The initiation of liquefaction settlement occurs when threshold ground acceleration is exceeded. The California Building Code specifies the use of a Peak Ground Acceleration (PGA_M) for use in liquefaction analyses. This resulted in a PGA used in our analysis of 0.5 g. We also assumed a design Moment Magnitude of 7.0. A historic high groundwater depth of 20 feet was assumed for analysis, based on CGS estimates. A Factor-of-Safety (FS) of 1.0 was assumed to initiate liquefaction.

We utilized LiqSVs1.0 – SPT & Vs Liquefaction Analysis Software (Geologismiki) to perform our liquefaction and dynamic compaction analysis on B-3. The estimated liquefaction and dynamic compaction induced vertical settlement during a design earthquake event at the project site was calculated to be on the order of ¾ inch to 1 inch.

The site is not considered to be susceptible to lateral spreading due to the lack of a nearby free slope face. Therefore, the potential for future seismic settlement due to lateral spreading is judged to be very low.

5.1.3 Fault Ground Rupture and Fault Creep

The State of California adopted the Alquist-Priolo Earthquake Fault Zone Act of 1972 (Chapter 7.5, Division 2, Sections 2621 – 2630, California Public Resources Code), which regulates development near active faults for the purpose of preventing surface fault rupture hazards to structures for human occupancy. In accordance with the

Alquist-Priolo (A-P) Act, the California Geological Survey established boundary zones or *Earthquake Fault Zones* surrounding faults or fault segments judged to be sufficiently active, well-defined and mapped for some distance. Structures for human occupancy within designated Earthquake Fault Zone boundaries are not permitted unless surface fault rupture and fault creep hazards are adequately addressed in a site-specific evaluation of the development site.

The site is not currently within a designated Earthquake Fault Zone as defined by the State (Hart and Bryant, 1997). Based on our evaluation, the potential for fault ground rupture or creep at the site is very low to nil.

5.2 Expansive Soils

The near surface soils observed and/or sampled during the exploration program generally consisted of non-plastic granular material. We did not encounter any potentially highly expansive soil. Therefore, special measures to mitigate the potential effects of expansive soils are not expected to be required for the project.

6.0 CONCLUSIONS AND ENGINEERING RECOMMENDATIONS

The following conclusions and engineering recommendations are based upon the analysis of the information gathered during the course of this study and our understanding of the proposed improvements.

The site is considered suitable from a geotechnical and geologic perspective for the proposed improvements provided the recommendations of this report are incorporated into the design and implemented during construction. The predominant geotechnical and geological issues affecting design or construction that will need to be addressed at this site are summarized below and addressed in the following sections.

Seismic Considerations - The site is located within a seismically active region and the structures should be designed to account for earthquake ground motions, using the applicable building codes, as described in Section 6.1 of this report.

Seismic Induced Settlements – There is a limited potential for seismic settlement due to liquefaction and dynamic compaction. We anticipate that total settlement for seismic loading will be on the order of 1-inch.

Weak Surficial Granular Soils – Relatively weak, loose granular soils were encountered within the upper 5 feet of the soil profile below the site. In order to limit potentially damaging total and differential settlements to a tolerable level, foundations bearing on such materials should be designed for reduced bearing pressures lower than normally anticipated for typical structures supported on stiff to dense, competent soils. As an alternative, allowable bearing pressures may be increased if desired by supporting foundations on a layer of engineered fill consisting of reworked onsite subsurface soils.

Winter Construction - If grading occurs in the winter rainy season, appropriate erosion control measures may be required, and weatherproofing of the building pad and/or hardscape areas may need to be considered. Winter rains may also impact foundation excavations and underground utilities.

6.1 Seismic Coefficients

The proposed building should be designed in accordance with local design practice to resist the lateral forces generated by ground shaking associated with a major earthquake occurring within the greater Bay Area. Based on the subsurface conditions encountered in our borings and our evaluation of the geology of the site, Site Class "D", representative of stiff soil averaged over the uppermost 100 feet of the subsurface profile would be appropriate for this site.

For seismic analysis of the proposed site in accordance with the seismic provisions of the 2016 California Building Code (CBC), we recommend the following seismic ground motion values be used for design shown in table 4, which are based on procedures outlined in ASCE 7-10 section 11.4.

Table 4: Seismic Design Parameters Based on ASCE 7-10

Item	Value	2016 CBC Source[R1]	ASCE 7-10 Table/Figure[R2]
Site Class	D	Table 1613A.3.2	Table 20.3-1
Seismic Design Category (Risk Category I, II, or III)	D	Section 1613.3.5	-
Mapped Spectral Response Accelerations Short Period, S_S 1-second Period, S_1	 1.484 g 0.507 g	-	 Figure 22-1 Figure 22-2
Site Coefficient, F_a	1.0	Table 1613A.3.3(1)	Table 11.4-1
Site Coefficient, F_v	1.5	Table 1613A.3.3(2)	Table 11.4-2
MCE (S_{MS})	1.484 g	Equation 16A-37	Equation 11.4-1
MCE (S_{M1})	0.760 g	Equation 16A-38	Equation 11.4-2
Design Spectral Response Acceleration Short Period, S_{DS} 1-second Period, S_{D1}	 0.989 g 0.507 g	 Equation 16A-39 Equation 16A-40	 Equation 11.4-3 Equation 11.4-4
Peak Ground Acceleration (PGA_M)	0.500 g	-	Equation 11.8-1

R1: California Building Standards Commission (CBSC), "California Building Code," 2016 Edition.
R2: U.S. Seismic "Design Maps" Web Application, https://geohazards.usgs.gov/secure/designmaps/us/application.php

6.2 Site Grading

6.2.1 General Grading and Material Requirements

Site grading is generally anticipated to consist of finish grading to establish site grades, or additional mass grading for improved foundation bearing capacities if desired; utility trench excavation and backfills, preparation of supporting subgrades for site pavements and hardscape; and placement of aggregate base (baserock) sections for hardscape and pavements.

On-site soils having an organic content of less than three percent by weight and Plasticity Index of less than 15 can be reused as fill as approved by the Geotechnical Engineer. Imported soil should be non-expansive, having a Plasticity Index of 15 or less, an R-Value greater than 40, and contain sufficient fines so the soil can bind together. Imported materials should be free of environmental contaminants, organic materials and debris, and should not contain rocks or lumps greater than three inches in maximum size. Import fill materials should be approved by the Geotechnical Engineer prior to use on site.

6.2.2 Project Compaction Recommendations

Table 5 provides the recommended compaction requirements for this project. Some items listed below may not apply to this project. Specific moisture conditioning and relative compaction recommendations will be discussed individually within applicable sections of this report.

Table 5: Project Compaction Recommendations

Description	Percent Relative Compaction	Minimum Percent Above Optimum Moisture Content
Building Pad, Onsite Soil	90	2
Building Pad, Subgrade Soil	90	2
Building Pad, Imported Select Fill	90	2
Building Pad, Treated Soil	90	2
AC or Concrete Pavement, Subgrade, Upper 6"	95	2
AC or Concrete Pavement, Onsite Soil or Fill	90	2
AC or Concrete Pavement, Class 2 Baserock	95	2
AC or Concrete Pavement, Treated Soil, Subgrade	93	2
Concrete Flatwork, Class 2 Baserock	90	2
Concrete Flatwork, Subgrade Soil	90	2
Underground Utility Trench Backfill	90	2
Underground Utility Trench Backfill - Landscape Areas (not including areas below flatwork)	85	2
Underground Utility Trench Backfill, Clean Sand	95	4
Underground Utility Trench Backfill, Upper 3' Feet below Existing Pavement Sections or 6" below New Pavement Sections	95	2

6.2.3 Site Preparation and Demolition

Site grading should be performed in accordance with these recommendations. A pre-construction conference should be held at the jobsite with representatives from the owner, general contractor, grading contractor, and Geo-Eng prior to starting the stripping and demolition operations at the site.

The site should be cleared of existing pavements (if any), vegetation, organic topsoil, debris, existing undocumented loose or soft fill, and other deleterious materials within the proposed development area. Removed fill soil may be evaluated by the Geotechnical Engineer for possible reuse and placement as engineered fill. The grading contractor should be aware of the possibility of buried objects and underground utilities at the site which are to be removed or abandoned appropriately. Holes resulting from the removal of underground obstructions extending below the proposed finish grade should be cleared and backfilled with properly compacted engineered fill or other material approved by the Geotechnical Engineer. We recommend backfilling operations for any excavations to remove deleterious material be carried out under the observation of the Geotechnical Engineer.

It is possible that existing underground utilities exist and if so, may impact the project construction. If encountered, the utilities will need to be properly abandoned and/or entirely removed from proposed building area. In general, utility pipelines less than four inches in diameter to be abandoned may be left in place provided they will not be near new foundation elements or interfere with new utilities. Such pipes should be plugged at the ends with concrete or sand-cement slurry. Larger utility pipelines or pipelines that underlie new foundations should be removed and replaced with engineered fill or left in place and completely grouted with flowable sand-cement slurry or other approved Controlled Density Fill (CDF; also known as Controlled Low Strength Material, or CLSM).

6.2.4 Building Subgrade Preparation

Following excavation to the required grades, subgrades in areas to receive engineered fill, slabs-on-grade, flatwork or pavements should be scarified to a depth of at least eight inches; moisture conditioned and compacted to the requirements for engineered fill presented in Section 6.2.2.

The compacted building pad surfaces should be firm and unyielding and should be protected from damage caused by traffic or weather. Soil subgrades should be kept moist during construction. In order to achieve satisfactory compaction of the subgrade and fill materials, it may be necessary to adjust the water content at the time of construction. This may require that water be added to soils that are too dry, or that scarification and aeration be performed in any soils that are too wet. Fill material should be evenly spread and compacted in lifts not exceeding eight inches in pre-compacted thickness.

Due to the presence of surficial weak granular material across the site, constructability concerns regarding trench and footing excavations may be encountered. There is potential for sloughing and unstable excavations. Therefore, we recommend that a 1% by weight soil admixture, such as cement or a lime-cement mixture such as "Quicklime Plus" be considered in the building pad areas to provide a more reliable working surface and apparent cohesion of the soils during excavations.

In the event unstable subgrade conditions are encountered during construction and are unworkable for construction equipment, compaction of exposed on-site soil subgrades may not be feasible after exposure. These conditions may be remedied using soil admixtures, such as cement or a lime-cement mixture such as "Quicklime Plus". More detailed recommendations can be provided during construction should unstable subgrades be encountered, or winterization measures be chosen by the contractor.

Unstable subgrades in smaller, isolated areas can be stabilized by over excavating to a minimum of 18 inches in depth below finished subgrade elevation where competent, stable soils are not encountered. The bottom of the excavation should then be completely covered with a ground stabilization geotextile fabric such as Mirafi 500X or equivalent, and typically backfilled with Class 2 aggregate base. Alternatively, with the approval of the Geotechnical Engineer, such areas can be stabilized by over-excavating at least one foot, placing Tensar TriAx TX-140 or equivalent geogrid on the soil, and then placing 12 inches of Class 2 baserock on the geogrid. The upper six inches of the baserock in either case should be compacted to at least 90% relative compaction.

Final grading should be designed to provide positive drainage away from the building. We suggest exposed soil/landscape areas, if any, within 10 feet of the proposed building be sloped at a minimum of three percent away from the building. Roof leaders and downspouts should discharge onto paved surfaces sloping away from the building or into a closed pipe system channeled away from the building to an approved collector or outfall.

6.2.5 Flatwork Areas

The existing soil in flatwork areas should be scarified to a depth of at least eight inches, moisture conditioned and compacted. Once the compacted subgrade has been reached, it is recommended that baserock in paved areas be placed immediately after grading to protect the subgrade soil from drying. Alternatively, the subgrade should be kept moist by watering until the baserock is placed. Rubber-tired heavy equipment, such as a full water truck, should be used to proof roll exposed pavement subgrade areas where pumping is suspected. Proof rolling will determine if the subgrade soil is capable of supporting construction paving equipment without excessive pumping or rutting.

6.3 Utility Trench Construction

6.3.1 Trench Backfilling

Utility trenches may be backfilled with onsite soil or import soil pre-approved by the Geotechnical Engineer above the utility bedding and shading materials. If cobbles, rocks or concrete larger than four inches in maximum size are encountered, they should be removed from the fill material prior to placement in the utility trenches.

Pipeline trenches should be backfilled with fill placed in lifts of approximately eight inches in pre-compacted thickness and compacted to the requirements presented in Section 6.2.2. However, thicker lifts can be used, provided the method of compaction is approved by the Geotechnical Engineer, and the required minimum degree of compaction is achieved.

6.3.2 Utility Penetrations at Building Perimeter

Flexible connections at building perimeters should be considered for utility lines going through perimeter foundations. This would provide flexibility during a seismic event. This could be provided by special flexible connections, pipe sleeving with appropriate waterproofing, or other methods.

6.4 Temporary Excavation Slopes

Below-grade construction, if any is ultimately proposed for the project, may require temporary excavation slopes if more than a few feet below existing grade. The Contractor should incorporate all appropriate requirements of OSHA/ Cal OSHA into the design of the temporary construction slopes and shoring system, whichever is used. Excavation safety regulations are provided in the OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926, Subpart P, and apply to excavations greater than five feet in depth.

The Contractor, or his specialty subcontractor, should design temporary construction slopes to conform to the OSHA regulations and should determine actual temporary slope inclinations based on the subsurface conditions exposed at the time of construction. For pre-construction planning purposes, the on-site near-surface materials may be assumed to be granular or weak cohesive materials and categorized as OSHA Type C with temporary slope inclination of no steeper than 1.5:1 (horizontal: vertical) for excavations less than 20 feet deep.

If temporary slopes are left open for extended periods of time, exposure to weather and rain could have detrimental effects such as sloughing and erosion on surficial soils exposed in the excavations. We recommend that all vehicles and other surcharge loads be kept at least 10 feet away from the top of temporary slopes, and that such temporary slopes are protected from excessive drying or saturation during construction. In addition, adequate provisions should be made to prevent water from ponding on top of the slope and from flowing over the slope face. Desiccation or excessive moisture in the excavation could reduce stability and require shoring or laying back side slopes.

6.5 Foundations

Due to the presence of loose granular surficial material across the site there is potential differential settlement underneath the structures. Therefore, we are providing recommendation for two alternate foundation systems to accommodate the potential settlement

6.5.1 Spread Footing Foundation on Engineered Fill

The proposed structures may be supported on conventional continuous and/or isolated spread footings bearing on three feet engineered fill. On site soil may be used as material for the engineered fill provided it is properly scarified, moisture conditioned, and re-compacted. Where over excavations below design footing depth is required, the over excavated portion of footing excavation should be backfilled with structural or lean concrete or a Controlled Low Strength Material (CLSM). Footings should be founded a minimum of 24 inches below lowest adjacent finished grade (typically the top of exterior grade) for exterior, perimeter footings, and a minimum of 24 inches below building pad subgrade for interior footings. Continuous footings should have a minimum width of at least 18 inches, and isolated column footings should have a minimum width of at least 24 inches. In addition, footings located adjacent to other footings or utility trenches should bear below an imaginary 1.5:1 (horizontal to vertical) plane projected upward from the bottom edge of the adjacent footings or utility trench. Footing reinforcement should be determined by the project Structural Engineer.

For the design of the footings bearing on three feet of engineered fill, we recommend the allowable bearing pressures presented in Table 6, assuming design Factors-of-Safety of 3.0, 2.0, and 1.5 for dead loads, dead plus live loads and total loads, respectively, from the calculated ultimate bearing pressure. The allowable pressures provided are net values, as the weight of the footing itself has already been accounted for and can be neglected as a load for design purposes.

Table 6: Allowable Bearing Pressures for Spread Footings

Load Condition	Allowable Bearing Pressure (psf)
Dead Load	2,000
Dead plus Live Loads	3,000
Total Loads (including wind or seismic)	4,000

6.5.2 Mat Foundation on Native Soil

As an alternative to spread footings bearing on three feet of engineered fill, the proposed structures may be supported on a structural mat foundation bearing on native soil. Where over excavations below design footing depth is required, the over excavated portion of footing excavation should be backfilled with structural or lean concrete or a Controlled Low Strength Material (CLSM). The structural mat slab should have a minimum thickness of 8 inches and reinforcement should be determined by the project Structural Engineer. A modulus of subgrade reaction of 150 pci can be used for he native soil on site.

For the design of the structural mat slab bearing on one foot of engineered fill over native soil, we recommend the average allowable bearing pressures presented in Table 7, assuming design Factors-of-Safety of 3.0, 2.0, and 1.5 for dead loads, dead plus live loads and total loads, respectively, from the calculated ultimate bearing pressure. The allowable pressures provided are net values, as the weight of the slab itself has already been accounted for and can be neglected as a load for design purposes.

Table 7: Allowable Bearing Pressures for Structural Mat Slab Foundation

Load Condition	Allowable Bearing Pressure (psf)
Dead Load	1,000
Dead plus Live Loads	1,500
Total Loads (including wind or seismic)	2,000

6.5.2 Lateral Resistance

For resistance to lateral loads, an allowable coefficient of friction of 0.40 between the base of the foundation elements and underlying material is recommended. In addition, an ultimate passive resistance equal to an equivalent fluid weighing 400 pounds per cubic foot (pcf) acting against the foundation may be used to resist lateral forces. The top 12 inches of passive resistance at foundations not adjacent to and confined by pavement, interior floor slab, or hardscape should be neglected. In order to fully mobilize this passive resistance, a lateral footing deflection on the order of one to two percent of the embedment of the footing is required. If it is desired to limit the amount of lateral deflection to mobilize the passive resistance, a proportional safety factor should be applied.

6.5.3 Construction Considerations

Geo-Eng personnel should be retained to observe and confirm that footing excavations prior to formwork and reinforcing steel placement bear in soils suitable for the recommended maximum design bearing pressure. If unsuitable soil is present, the excavation should be deepened until suitable supporting material is encountered. The over excavation should be backfilled using structural or lean concrete up to the bottom of the footing concrete.

Footing excavations should have firm bottoms and be free from excessive slough prior to concrete or reinforcing steel placement. Care should also be taken to prevent excessive wetting or drying of the bearing materials during construction. Extremely wet or dry or any loose or disturbed material in the bottom of the footing excavations

should be removed prior to placing concrete. If construction occurs during the winter months, a thin layer of concrete (sometimes referred to as a rat slab) could be placed at the bottom of the footing excavations. This will protect the bearing soil and facilitate removal of water and slough if rainwater fills the excavations.

6.6 Concrete Slabs-on-Grade

6.6.1 General Recommendations

Non-structural concrete at-grade interior slab-on-grade floors should be a minimum of five inches in thickness. The concrete floor slab should be underlain by a minimum 18-inch thickness of non-expansive fill (e.g., Class 2 aggregate base). Slab reinforcing should be provided in accordance with the anticipated use and loading of the slab, but as a minimum should consist of No. 4 bars spaced at 18-inch centers each way. Slab-on-grade subgrade surfaces should be proof-rolled to provide a smooth, unyielding surface for slab support.

Slab-on-grade concrete floors with moisture sensitive floor coverings should be underlain by a moisture retarder system constructed between the slab and subgrade. Such a system could consist of four inches of free-draining gravel, such as 3/4-inch, clean, crushed, uniformly graded gravel with less than three percent passing No. 200 sieve, or equivalent, overlain by a relatively impermeable vapor retarder placed between the subgrade soil and the slab. The vapor retarder should be at least 10-mil thick and should conform to the requirements for ASTM E 1745 Class A, B, or C Underslab Vapor Retarders (e.g., Griffolyn Type 65, Griffolyn Vapor Guard, Moistop Ultra C, or equivalent). If additional protection is desired by the owner, a higher quality vapor barrier conforming to the requirements of ASTM E 1745 Class A, with a water vapor transmission rate less than or equal to 0.006 gr/ft^2/hr (i.e., 0.012 perms) per ASTM E 96 (e.g., 15-mil thick "Stego Wrap Class A") may be used in place of the retarder.

The vapor retarder or barrier should be placed directly under the slab. A capillary rock layer or rock cushion is not required if Class A barriers has been used beneath the floor slab and a sand layer is not required over the vapor retarder from a geotechnical standpoint. If sand on top of the vapor retarder is required by the design structural engineer, we suggest the thickness be minimized to less than one inch. If construction occurs in the winter months, water may pond within the sand layer since the vapor retarder may prevent the vertical percolation of rainwater.

ASTM E1643 should be utilized as a guideline for the installation of the vapor retarder. During construction, all penetrations (e.g., pipes and conduits,) overlap seams, and punctures should be completely sealed using a waterproof tape or mastic applied in accordance with the vapor retarder manufacturer's specifications. The vapor retarder or barrier should extend to the perimeter cutoff beam or footing.

6.6.2 Exterior Concrete Flatwork

Exterior concrete flatwork with pedestrian traffic should be at least four inches thick and should be underlain by at least six-inches of aggregate baserock. The subgrade beneath the flatwork should be moisture conditioned and compacted as specified in the grading section of this report.

Control joints should be constructed in accordance with ACI 224 "Control of Cracking in Concrete Structures". In general, for typical flatwork, joints would be required every 24 to 36 times the concrete thickness.

6.7 Retaining/Basement Walls

6.7.1 Lateral Earth Pressures

The following recommended lateral earth design pressures are based on the assumption that on-site soils will be used as wall backfill. For a level backfill condition, unrestrained walls (i.e., walls that are free to deflect or rotate) should be designed to resist an equivalent fluid pressure of 35 pounds per cubic foot. Restrained walls for a level backfill condition should be designed to resist an equivalent fluid pressure of 35 pounds per cubic foot, plus an additional uniform lateral pressure of 5H pounds per square foot, where H = height of backfill above the top of the wall footing, in feet. For seismic design of walls greater than six feet in retained height, unrestrained and restrained walls with level backfill should be designed to resist an additional uniform load equal to 15H psf, added to the *unrestrained* condition in either case. A seismic increment is not required for site walls retaining less than six feet.

Walls with inclined backfill should be designed for an additional equivalent fluid pressure of one pound per cubic foot for every two degrees of slope inclination from horizontal. Walls subjected to surcharge loads should be designed for an additional uniform lateral pressure equal to 0.33 times the anticipated surcharge load for unrestrained walls, and 0.50 times the anticipated surcharge load for restrained walls.

For resistance to lateral loads, an allowable coefficient of friction of 0.40 between the base of the foundation elements and underlying material is recommended. In addition, an *ultimate* passive resistance equal to an equivalent fluid weighing 400 pounds per cubic foot (pcf) acting against the foundation may be used for lateral load resistance against the sides of the footing perpendicular to the direction of loading where the footing is poured neat against undisturbed material (i.e., native soils or engineered fills). The top foot of passive resistance at foundations not adjacent to and confined by pavement, interior floor slab, or hardscape should be neglected. In order to fully mobilize this passive resistance, a lateral footing deflection on the order of one to two percent of

the embedment of the footing is required. If it is desired to limit the amount of lateral deflection to mobilize the passive resistance, a proportional safety factor should be applied.

The lateral earth pressures herein do not include any factor-of-safety and are not applicable for submerged soils/hydrostatic loading. Additional recommendations may be necessary if submerged conditions are to be included in the design.

6.7.2 Retaining Wall Foundations

Retaining and below-grade walls may be founded on spread footing foundations following the recommendations outlined in section 6.5. Assuming a minimum 24-inch footing embedment below lowest adjacent grade, retaining wall footings may be designed using an allowable bearing capacity based off Table 4, in section 6.5.1.

6.7.3 Retaining Wall Drainage

The aforementioned recommended lateral pressures assume that walls are fully back drained to prevent the build-up of hydrostatic pressures. To reduce the potential for hydrostatic loading on retaining and below-grade walls due to possible seasonal subsurface groundwater seepage, a subsurface drain system may be considered for construction behind below-grade walls. Alternatively, below-grade walls can be designed to accommodate an additional hydrostatic pressure increment.

The drain system should consist of free-draining granular soils containing less than five percent fines passing a No. 200 sieve, placed adjacent to the wall. The free-draining granular material should be graded to prevent the intrusion of fines, or else should be encapsulated in a suitable filter fabric. A drainage system consisting of perforated drain lines (minimum 4" diameter placed near the base of the wall) should be used to intercept and discharge water which would tend to saturate the backfill. Sub drains constructed to protect interior spaces should have the invert elevation of the sub drain a minimum of six-inches below the interior finished floor elevation. Where used, drain lines should be embedded in a uniformly graded filter material and provided with adequate clean-outs for periodic maintenance. An impervious soil should be used in the upper one-foot layer of backfill to reduce the potential for water infiltration. As an alternative, a prefabricated drainage structure, such as geo-composite, may be used as a substitute for the granular backfill adjacent to the wall.

The retaining wall drainage system should be sloped to outfall to the storm drain system or other appropriate facility. The foundation of the retaining wall should be protected and prevented from any erosion of the surroundings.

6.7.4 Retaining Wall Backfill Compaction

Retaining wall backfill less than five feet deep should be compacted to at least 90 percent relative compaction using light compaction equipment. Backfill greater than a depth of five feet should be compacted to at least 95 percent relative compaction. If heavy compaction equipment is used, the walls should be appropriately designed to withstand loads exerted by the heavy equipment, and/or temporarily braced. Over compaction or surcharge from heavy equipment too close to the wall may cause excessive lateral earth pressures which could result in excessive outward wall movement.

6.8 Observation and Testing During Construction

We recommend that Geo-Eng be retained to provide observation and testing services during site preparation, site grading, pavement section preparation, utility construction, foundation excavation, and to observe final site drainage. This is to observe compliance with the design concepts, specifications and recommendations, and to allow for possible changes if subsurface conditions differ from those anticipated prior to the start of construction.

7.0 LIMITATIONS AND UNIFORMITY OF CONDITIONS

The recommendations of this report are based upon the soil and conditions encountered in the field explorations (i.e., borings). If variations or undesirable conditions are encountered during construction, Geo-Eng should be contacted so that supplemental recommendations may be provided.

This report is issued with the understanding that it is the responsibility of the owner or his representatives to see that the information and recommendations contained herein are called to the attention of the other members of the design team and incorporated into the plans and specifications, and that the necessary steps are taken to see that the recommendations are implemented during construction.

The findings and recommendations presented in this report are valid as of the present time for the development as currently proposed. However, changes in the conditions of the property or adjacent properties may occur with the passage of time, whether by natural processes or the acts of other persons. In addition, changes in applicable or appropriate standards may occur through legislation or the broadening of knowledge. Accordingly, the findings and recommendations presented in this report may be invalidated, wholly or in part, by changes outside our control. Therefore, this report is subject to review by Geo-Eng after a period of three (3) years has elapsed from the date of issuance of this report. In addition, if the currently proposed design scheme as noted in this report is altered, Geo-Eng should be provided the opportunity to review the changed design and provide supplemental recommendations as needed.

Recommendations are presented in this report which specifically request that Geo-Eng be provided the opportunity to review the project plans prior to construction and that we be retained to provide observation and testing services during construction. The validity of the recommendations of this report assumes that Geo-Eng will be retained to provide these services.

This report was prepared upon your request for our services, and in accordance with currently accepted geotechnical engineering practice. No warranty based on the contents of this report is intended, and none shall be inferred from the statements or opinions expressed herein. The scope of our services for this report did not include an environmental assessment or investigation for the presence or absence of wetlands or hazardous or toxic materials in the soil, surface water, groundwater or air, on, below or around this site. Any statements within this report or on the attached figures, logs or records regarding odors noted or other items or conditions observed are for the information of our client only.

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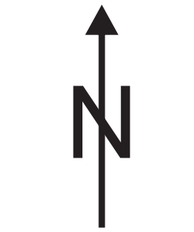
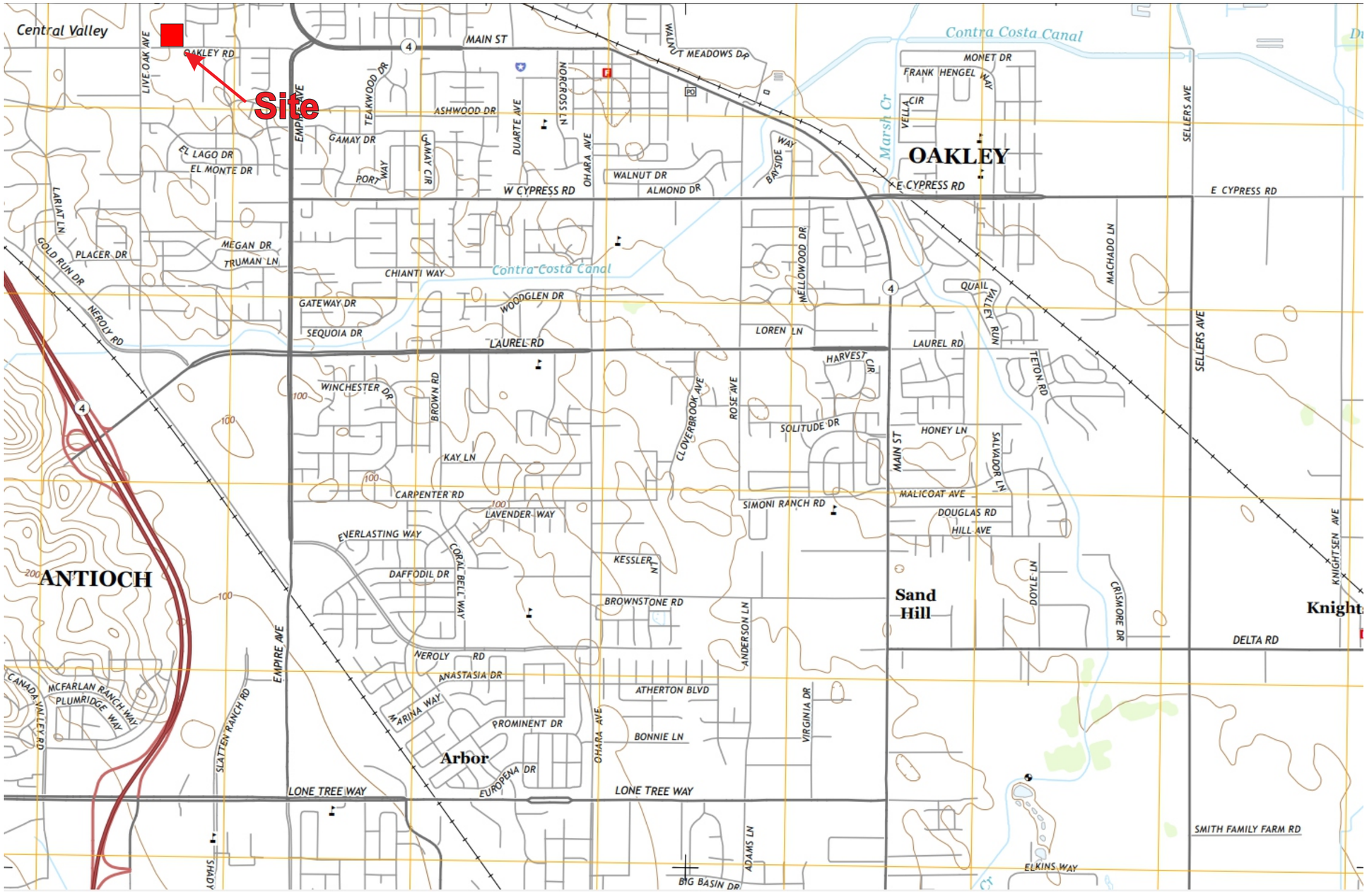
FIGURES



QUADRANGLE LOCATION



1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

Source: Brentwood Quadrangle, California, US Topographic Map
7.5-Minute Series, United States Geological Survey (2015)

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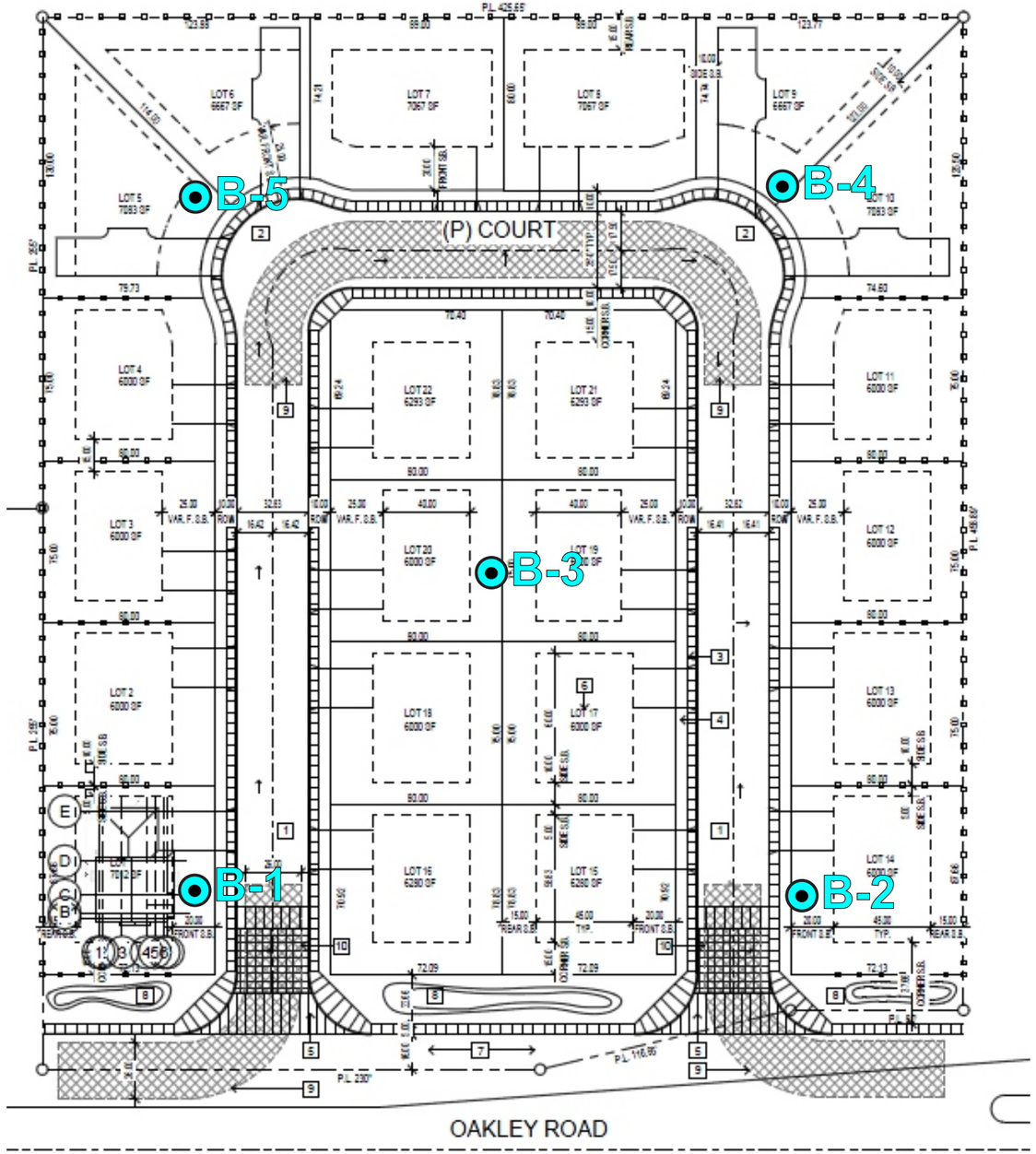
11-1062	August 2018
Site Vicinity Map	Figure 1



Approximate boring location

Oakley Residential Development, Cover Sheet and Site Plan, Proposed, Sheet A000, prepared by GKW Architects, dated 8/23/2018

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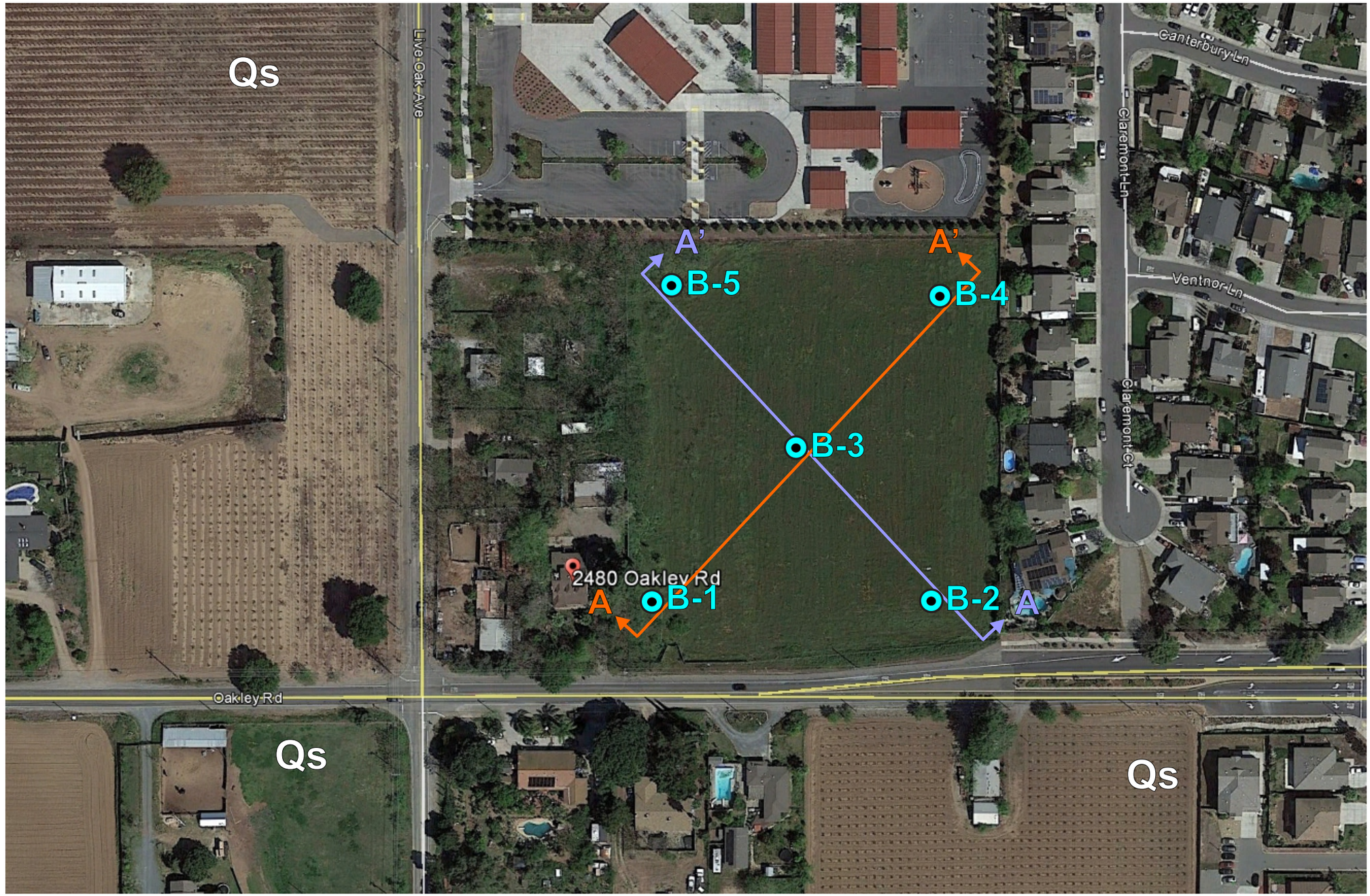
Site Development Plan	Figure 2



Base Map Reference: Google Earth

Qs: Beach and Dune Sand, Quaternary

Approximate boring location

Geologic Cross Section

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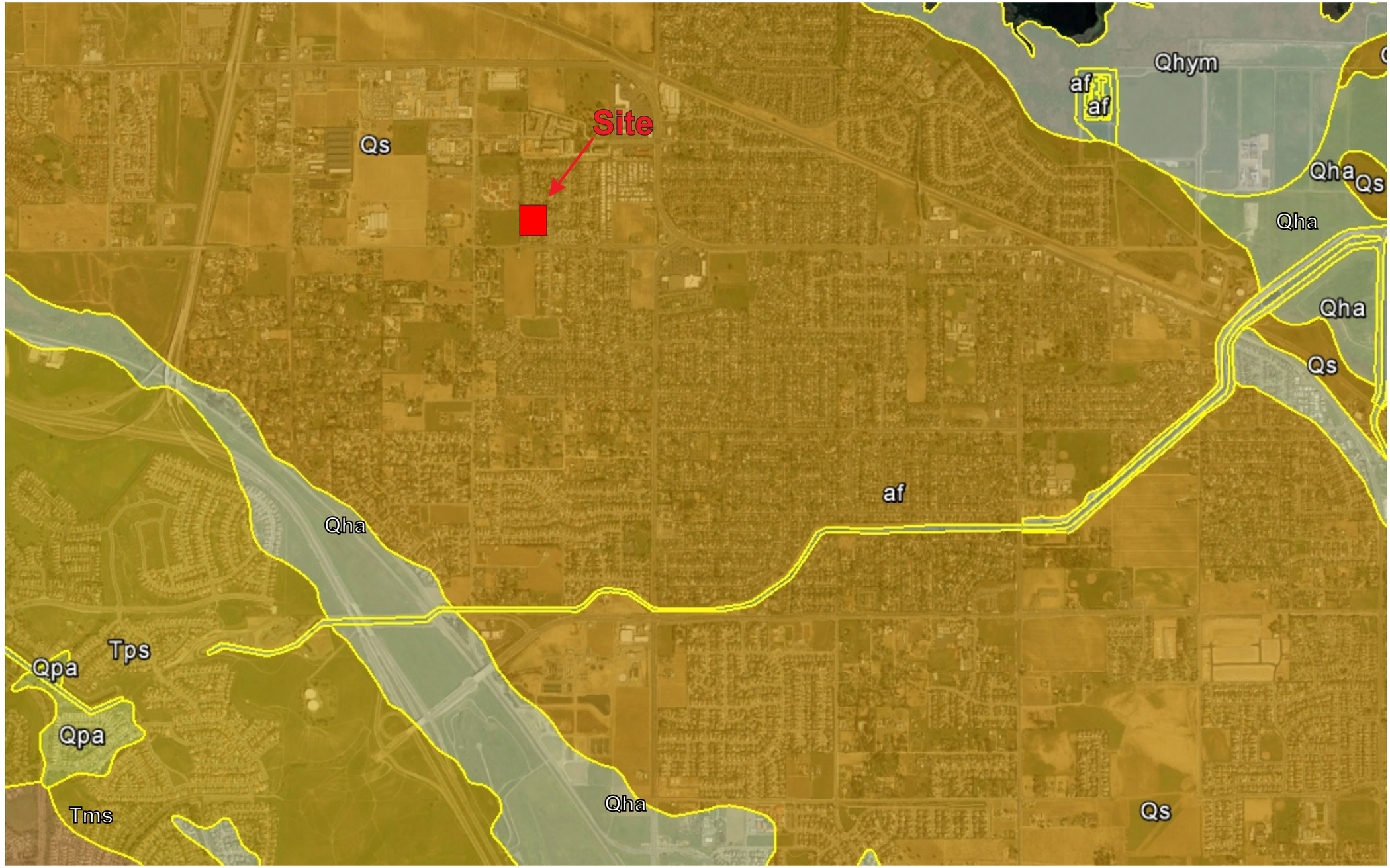
Site Plan and Site Geology Map	Figure 3



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Geologic Faults
Geologic Contacts

Qha - Alluvium, Holocene
Qpa - Alluvium, Pleistocene
Qhym - Mud deposits, late Holocene
Qs - Beach and dune sand, Quaternary
Tps - Sedimentary rocks, Miocene
af - Artificial Fill

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Site Vicinity Geologic Map	Figure 4

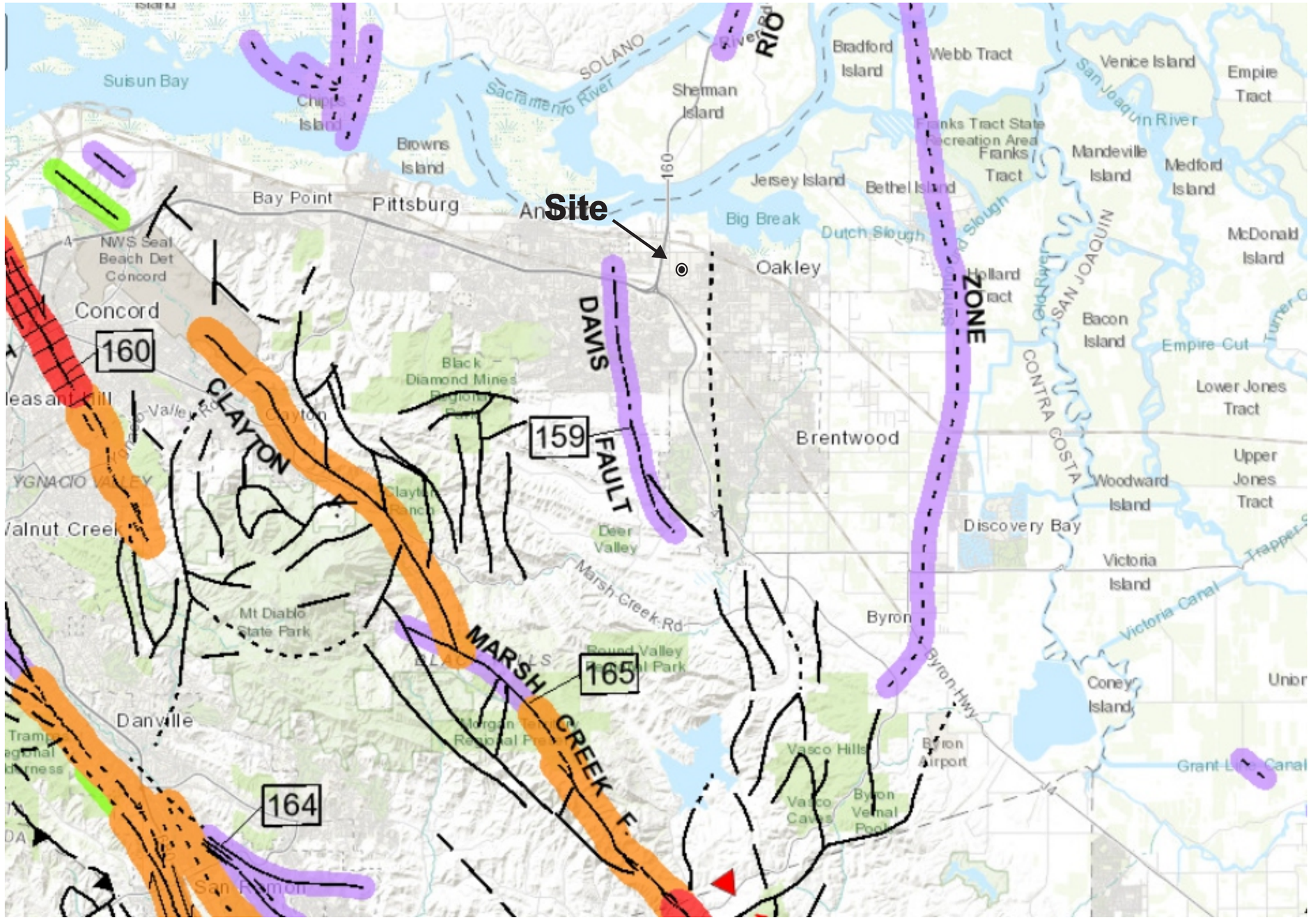
Fault along which historic (last 200 years) displacement has occurred.

Holocene fault displacement (during past 11,700 years) without historic record.

Late Quaternary fault displacement (during past 700,000 years).

Quaternary fault (age undifferentiated).

Pre-Quaternary fault (older that 1.6 million years) or fault without recognized Quaternary displacement.



Base Map Reference: California Geological Survey - 2010 Fault Activity Map of California

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Regional Fault Map	Figure 5

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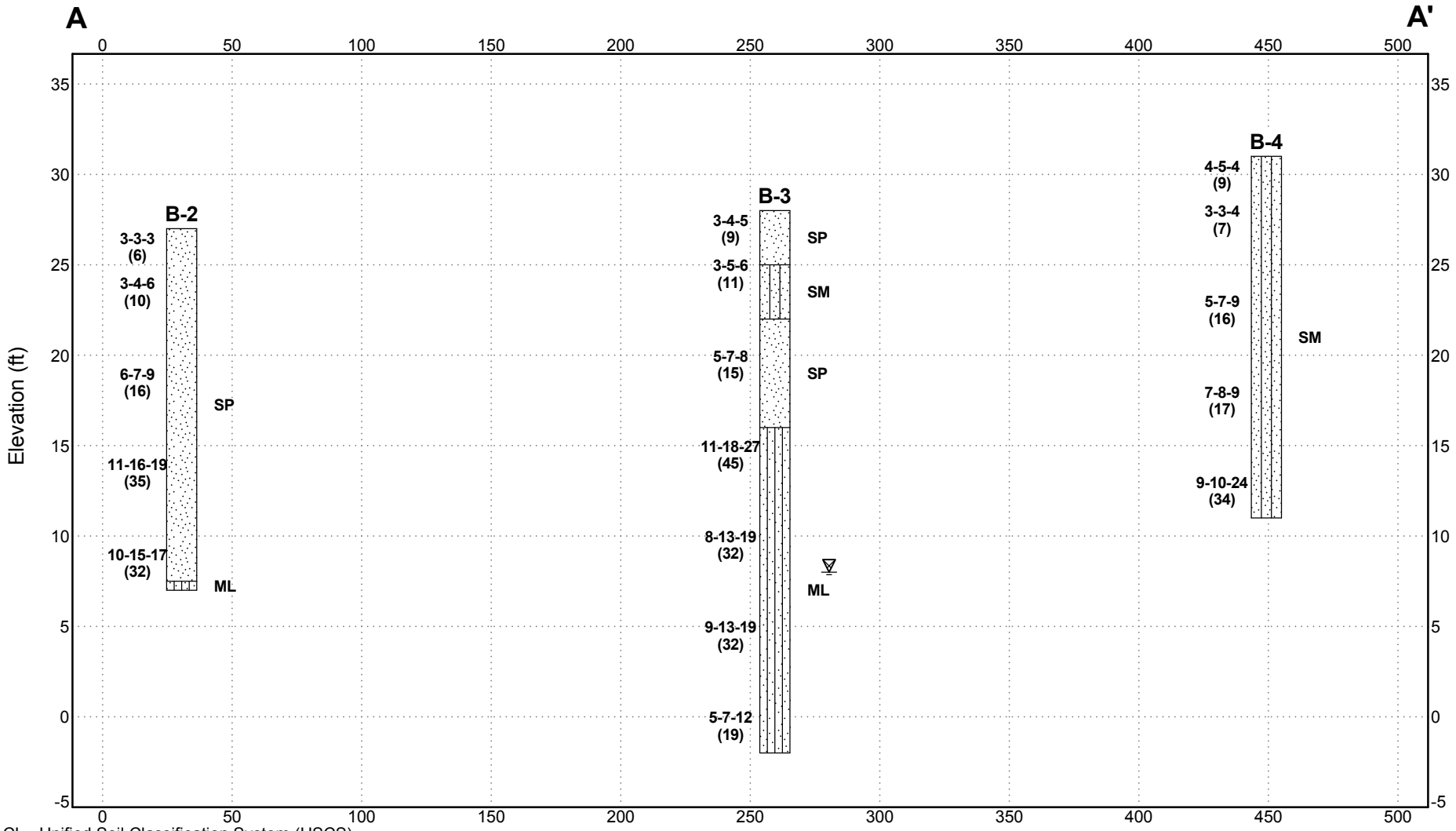
SUBSURFACE DIAGRAM

CLIENT GKW Architects

PROJECT NAME Oakley Residential Subdivision

PROJECT NUMBER 11-1062

PROJECT LOCATION 2480 Oakley Road, Oakley



CL - Unified Soil Classification System (USCS)
14 - Blows Per Six Inches, Standard Penetration Test
(21) - N Value

Schematic Geologic Cross-Section A-A' | Figure 6a

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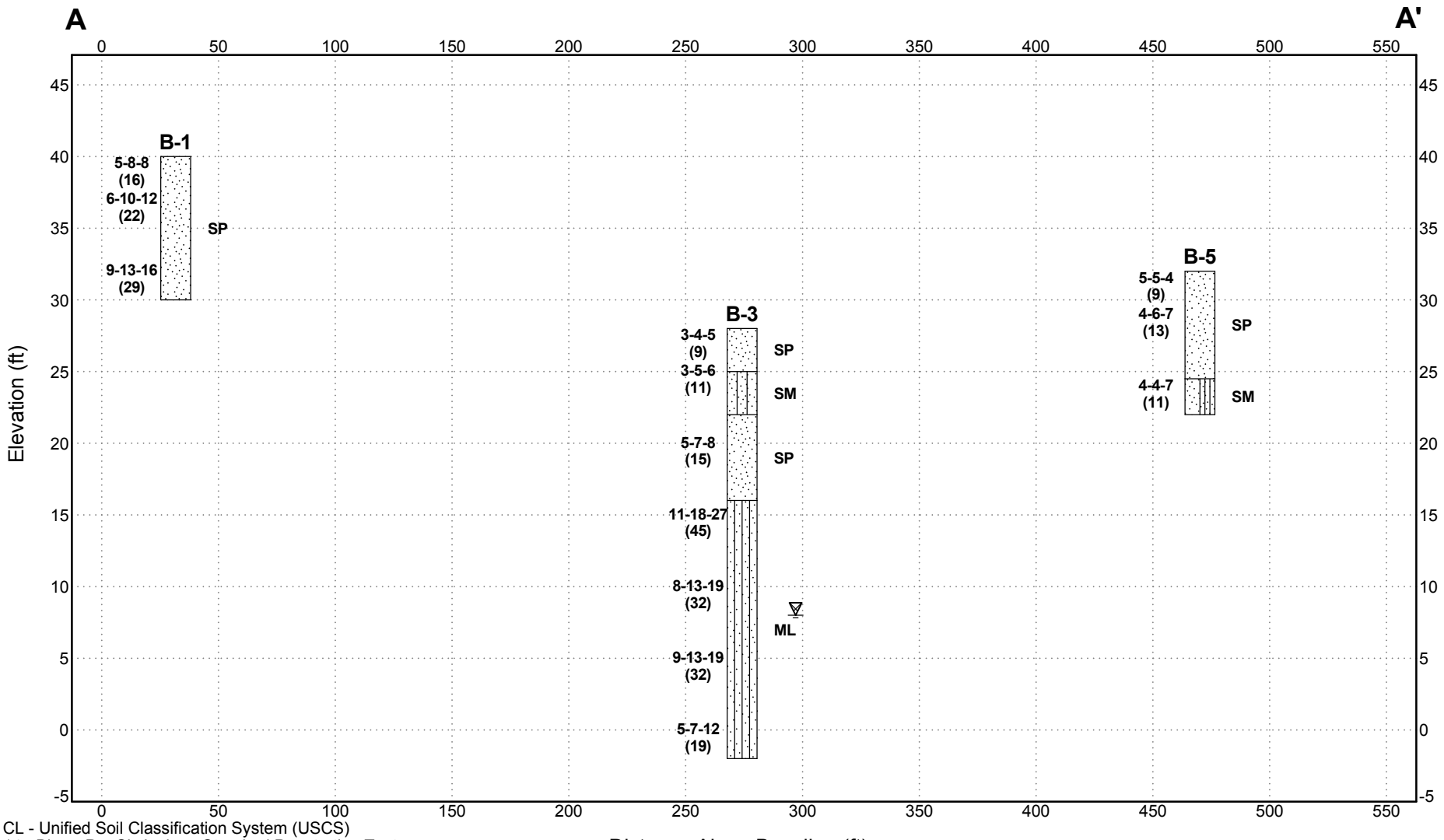
SUBSURFACE DIAGRAM

CLIENT GKW Architects

PROJECT NAME Oakley Residential Subdivision

PROJECT NUMBER 11-1062

PROJECT LOCATION 2480 Oakley Road, Oakley



CL - Unified Soil Classification System (USCS)
14 - Blows Per Six Inches, Standard Penetration Test
(21) - N Value

Schematic Geologic Cross-Section A-A' | Figure 6b

SEISMIC HAZARD ZONES

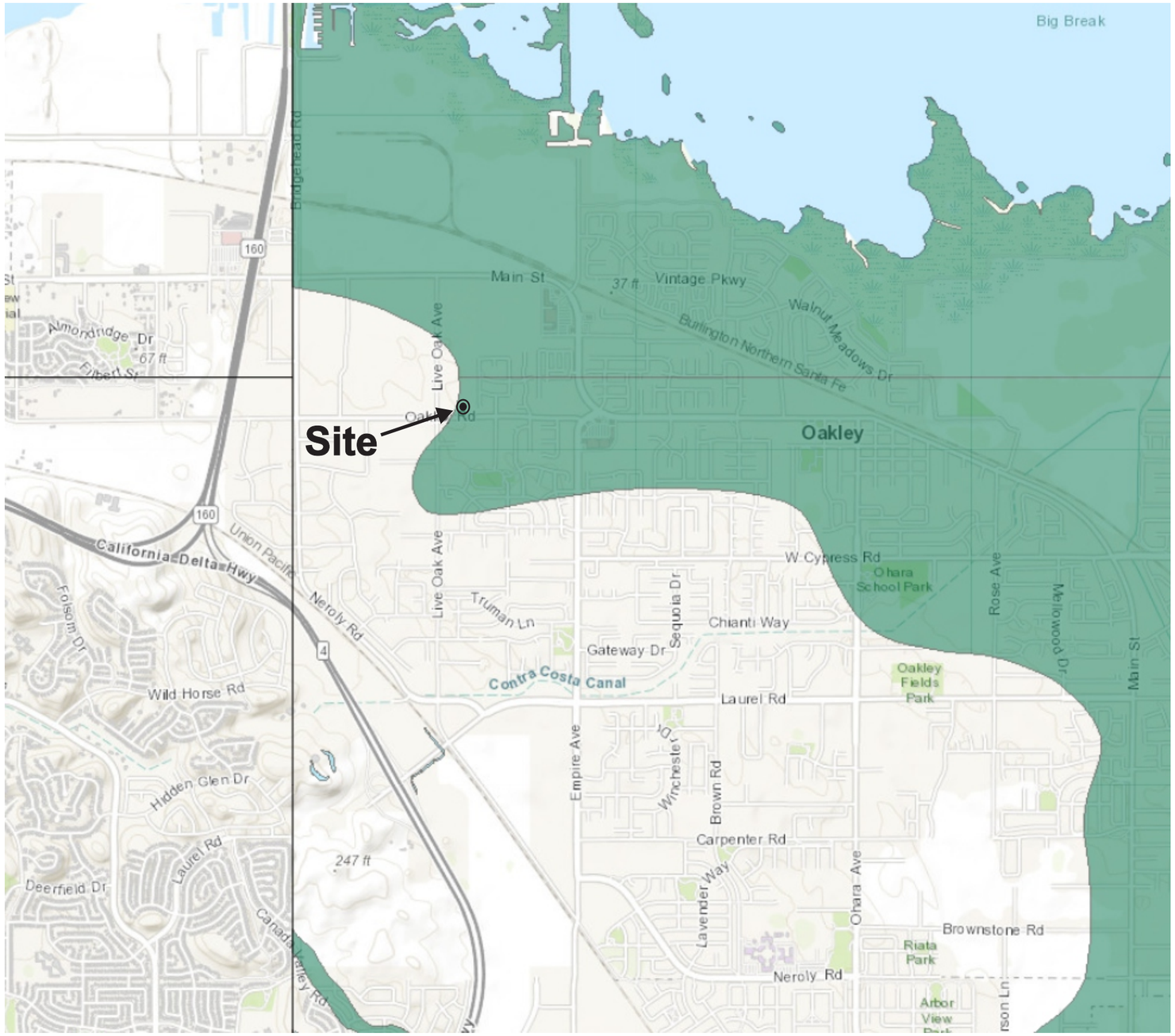
Liquefaction Zones
Areas where historical occurrence of liquefaction, or local geological, geotechnical and ground water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Earthquake-Induced Landslide Zones
Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

ALQUIST-PRIOLO EARTHQUAKE FAULT ZONES

Earthquake Fault Zones
Zone boundaries are delineated by straight-line segments; the boundaries define the zone encompassing active faults that constitute a potential hazard to structures from surface faulting or fault creep such that avoidance as described in Public Resources Code Section 2621.5(a) would be required.

Active Fault Traces
Faults considered to have been active during Holocene time and to have potential for surface rupture: Solid Line in Black or Red where Accurately Located; Long Dash in Black or Solid Line in Purple where Approximately Located; Short Dash in Black or Solid Line in Orange where Inferred; Dotted Line in Black or Solid Line in Rose where Concealed; Query (?) indicates additional uncertainty. Evidence of historic offset indicated by year of earthquake-associated event or C for displacement caused by fault creep.



Earthquake Zones of Required Investigation, Brentwood Quadrangle, California Geologic Survey, 2018

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Residential Subdivision 2480 Oakley Road Oakley, CA	11-1062 / August 2018
	Seismic Hazard Map / Figure 7

APPENDIX A

FIELD EXPLORATION
Key to Exploratory Boring Logs
Boring Logs

Unified Soil Classification (USC) System (from ASTM D 2487)

Major Divisions				Typical Names
Course-Grained Soils More than 50% retained on the 0.075 mm (No. 200) sieve	**Gravels** 50% or more of course fraction retained on the 4.75 mm (No. 4) sieve	Clean Gravels	GW	Well-graded gravels and gravel-sand mixtures, little or no fines
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines
		Gravels with Fines	GM	Silty gravels, gravel-sand-silt mixtures
			GC	Clayey gravels, gravel-sand-clay mixtures
	Sands 50% or more of course fraction passes the 4.75 (No. 4) sieve	Clean Sands	SW	Well-graded sands and gravelly sands, little or no fines
			SP	Poorly graded sands and gravelly sands, little or no fines
		Sands with Fines	SM	Silty sands, sand-silt mixtures
			SC	Clayey sands, sand-clay mixtures
Fine-Grained Soils More than 50% passes the 0.075 mm (No. 200) sieve	**Silts and Clays** Liquid Limit 50% or less		ML	Inorganic silts, very fine sands, rock four, silty or clayey fine sands
			CL	Inorganic clays of low to medium plasticity, gravelly/sandy/silty/lean clays
			OL	Organic silts and organic silty clays of low plasticity
	Silts and Clays Liquid Limit greater than 50%		MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts
			CH	Inorganic clays or high plasticity, fat clays
			OH	Organic clays of medium to high plasticity
Highly Organic Soils			PT	Peat, muck, and other highly organic soils

PENETRATION RESISTANCE (RECORDED AS BLOWS/0.5 FEET)

SAND AND GRAVEL		SILT AND CLAY		
RELATIVE DENSITY	N-VALUE (BLOWS/FOOT)*	CONSISTENCY	N-VALUE (BLOWS/FOOT)*	COMPRESSIVE STRENGTH
Very Loose	0 - 3	Very Soft	0 - 1	0 - 0.25
Loose	4 - 10	Soft	2 - 4	0.25 - 0.50
Medium Dense	11 - 29	Medium Stiff	5 - 7	0.50 - 1.0
Dense	30 - 49	Stiff	8 - 14	1.0 - 2.0
Very Dense	50 +	Very Stiff	15 - 29	2.0 - 4.0
		Hard	30 +	Over 4.0

Particle Sizes		
Components		*Size or Sieve Number*
Boulders		Over 12 inches
Cobbles		3 to 12 inches
Gravels	Coarse	3/4 to 3 inches
	Fine	Number 4 to 3/4 inch
Sand	Coarse	Number 10 to Number 4
	Medium	Number 40 to Number 10
	Fine	Number 200 to Number 40
Fines (Silt and Clay)		Below Number 200

Soil Moisture	
Descriptor	*Description*
Dry	Dry of Standard Proctor Optimum
Damp	Sand Dry
Moist	Near Standard Proctor Optimum
Wet	Wet of Standard Proctor Optimum
Saturated	Free Water in Sample


Bulk Sample


Standard Penetration Test


2.5 Inch Modified California Sampler

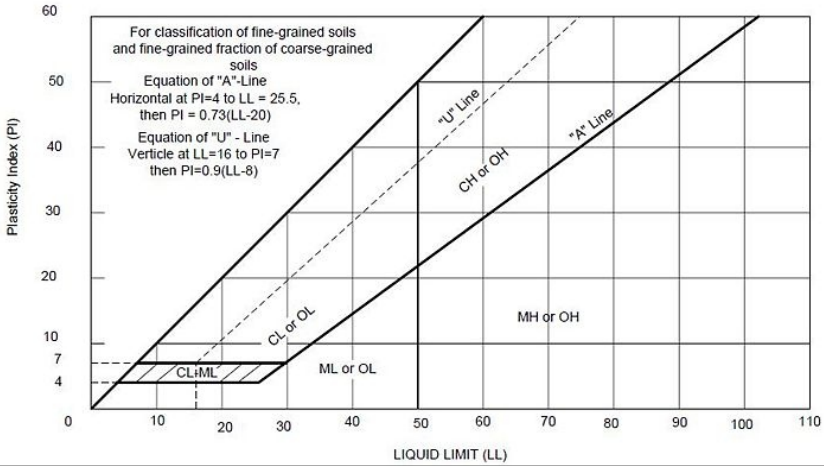

Shelby Tube


First Water Level Reading


Final Water Level Reading

Blow Count
The number of blows of the sampling hammer required to drive the sampler through each of three 6-inch increments. Less than three increments may be reported if more than 50 blows are counted for any increment. The notation 50/5" indicates 50 blows recorded for 5 inches of penetration. Note all of the field blow counts recorded using a Modified California sampler were converted to equivalent SPT blow counts.

N-Value
Number of blows 140 LB hammer falling 30 inches to drive a 2 inch outside diameter (1-3/8 innch I.D.) split barrel sampler the last 12 inches of an 18 inch drive (ASTM-1586 Standard Penetration Test).



General Notes:

1. The boring locations were determined by pacing, sighting and/or measuring from site features. Locations are approximate. Elevations of borings (if included) were determined by interpolation between plan contours or from another source identified in the report. The location and elevation of borings should be considered accurate only to the degree implied by the method.

2.The stratification lines represent the approximate boundary between soil types. The transition may be gradual.

3. Water level readings in the drill holes were recorded at the time and under the conditions stated on the boring logs. It should be noted that flucuations in the level of groundwater may occur due to variations in rainfall, tides and other factors at the time measurements were made

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Key to Exploratory Boring Logs

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BORING NUMBER B-1

CLIENT GKW Architects
PROJECT NAME Oakley Residential Subdivision
PROJECT NUMBER 11-1062
PROJECT LOCATION 2480 Oakley Road, Oakley
DATE STARTED 7/18/18 **COMPLETED** 7/18/18
GROUND ELEVATION 40 ft **HOLE SIZE** 8"
DRILLING CONTRACTOR Exploration Geoservices Inc.
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger 8"
AT TIME OF DRILLING ---
LOGGED BY CF **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	SPT BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		(SP) **Poorly Graded SAND** : Yellow brown, dry to damp, medium dense, fine to medium coarse, with trace organics	MC 1-1		5-8-8 (16)							
5		Becomes moist, no organics	MC 1-2		6-10-12 (22)							
10			MC 1-3		9-13-16 (29)							

Bottom of borehole at 10.0 feet.

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BORING NUMBER B-2

CLIENT GKW Architects
PROJECT NAME Oakley Residential Subdivision
PROJECT NUMBER 11-1062
PROJECT LOCATION 2480 Oakley Road, Oakley
DATE STARTED 8/6/18 **COMPLETED** 8/6/18
GROUND ELEVATION 27 ft **HOLE SIZE** 4"
DRILLING CONTRACTOR California Geotech Services, LLC
GROUND WATER LEVELS:
DRILLING METHOD Solid Flight
AT TIME OF DRILLING ---
LOGGED BY CF **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	SPT BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		(SP) **Poorly Graded SAND** : Yellow brown, damp, loose, fine to medium coarse, with trace organics										
			MC 2-1		3-3-3 (6)		97	4				
		Becomes moist, no organics	MC 2-2		3-4-6 (10)							
5												
		Becomes medium dense	MC 2-3		6-7-9 (16)		91	5				
10												
		Becomes dense	SPT 2-4		11-16-19 (35)							
15												
			SPT 2-5		10-15-17 (32)							
20		(ML) **Sandy SILT** : Yellow brown, moist to wet, hard										

Bottom of borehole at 20.0 feet.

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BORING NUMBER B-3

CLIENT GKW Architects
PROJECT NAME Oakley Residential Subdivision
PROJECT NUMBER 11-1062
PROJECT LOCATION 2480 Oakley Road, Oakley
DATE STARTED 8/6/18 **COMPLETED** 8/6/18
GROUND ELEVATION 28 ft **HOLE SIZE** 4"
DRILLING CONTRACTOR California Geotech Services, LLC
GROUND WATER LEVELS:
DRILLING METHOD Solid Flight
AT TIME OF DRILLING ---
LOGGED BY CF **CHECKED BY**
AT END OF DRILLING 20.00 ft / Elev 8.00 ft
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	SPT BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		(SP) **Poorly Graded SAND** : Yellow brown, damp, loose, fine to medium coarse, with trace organics	MC 3-1		3-4-5 (9)							
5		(SM) **Silty SAND** : Yellow brown, damp, medium dense, fine to medium coarse	MC 3-2		3-5-6 (11)		102	4				14
		(SP) **Poorly Graded SAND** : Yellow brown, damp, medium dense, fine to medium coarse, with trace organics Sand becomes more coarse with depth										
10			MC 3-3		5-7-8 (15)		102	5				3
		(ML) **Sandy SILT** : Yellow brown, moist, hard, plastic, with thin layers of sand										
15		Becomes dense	MC 3-4		11-18-27 (45)			20				69
20		Becomes wet, with alternating thin layers of silt and sand	SPT 3-5		8-13-19 (32)							

(Continued Next Page)

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BORING NUMBER B-3

CLIENT GKW Architects **PROJECT NAME** Oakley Residential Subdivision

PROJECT NUMBER 11-1062 **PROJECT LOCATION** 2480 Oakley Road, Oakley

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	SPT BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
20		(ML) **Sandy SILT :** Yellow brown, moist, hard, plastic, with thin layers of sand *(continued)*										
		Varying sand content	SPT 3-6		9-13-19 (32)			21				57
25												
		Becomes very stiff	SPT 3-7		5-7-12 (19)			28				71
30												

Bottom of borehole at 30.0 feet.

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BORING NUMBER B-4

CLIENT GKW Architects
PROJECT NAME Oakley Residential Subdivision
PROJECT NUMBER 11-1062
PROJECT LOCATION 2480 Oakley Road, Oakley
DATE STARTED 8/6/18 **COMPLETED** 8/6/18
GROUND ELEVATION 31 ft **HOLE SIZE** 4"
DRILLING CONTRACTOR California Geotech Services, LLC
GROUND WATER LEVELS:
DRILLING METHOD Solid Flight
AT TIME OF DRILLING ---
LOGGED BY CF **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	SPT BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		(SM) **Silty SAND** : Yellow brown, dry to damp, loose, fine to medium coarse, with trace organics	MC 4-1		4-5-4 (9)		102	3				17
5		Becomes damp, no organics	MC 4-2		3-3-4 (7)							
10		Becomes medium dense, with some clay/silt	MC 4-3		5-7-9 (16)							
15			SPT 4-4		7-8-9 (17)			5				16
20		Becomes dense, moist	SPT 4-5		9-10-24 (34)			13				31

Bottom of borehole at 20.0 feet.

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BORING NUMBER B-5

CLIENT GKW Architects
PROJECT NAME Oakley Residential Subdivision
PROJECT NUMBER 11-1062
PROJECT LOCATION 2480 Oakley Road, Oakley
DATE STARTED 8/6/18 **COMPLETED** 8/6/18
GROUND ELEVATION 32 ft **HOLE SIZE** 4"
DRILLING CONTRACTOR California Geotech Services, LLC
GROUND WATER LEVELS:
DRILLING METHOD Solid Flight
AT TIME OF DRILLING ---
LOGGED BY CF **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	SPT BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		(SP) **Poorly Graded SAND** : Yellow brown, dry to damp, medium dense, fine to medium coarse, with trace organics										
			MC 5-1		5-5-4 (9)		99	3				
		Becomes moist, medium dense	MC 5-2		4-6-7 (13)		110	5				
5												
		(SM) **Silty SAND** : Yellow brown, moist, medium dense										
			MC 5-3		4-4-7 (11)							
10												

Bottom of borehole at 10.0 feet.

APPENDIX B

LABORATORY TEST RESULTS
Particle Size Distribution Report

GRAIN SIZE DISTRIBUTION

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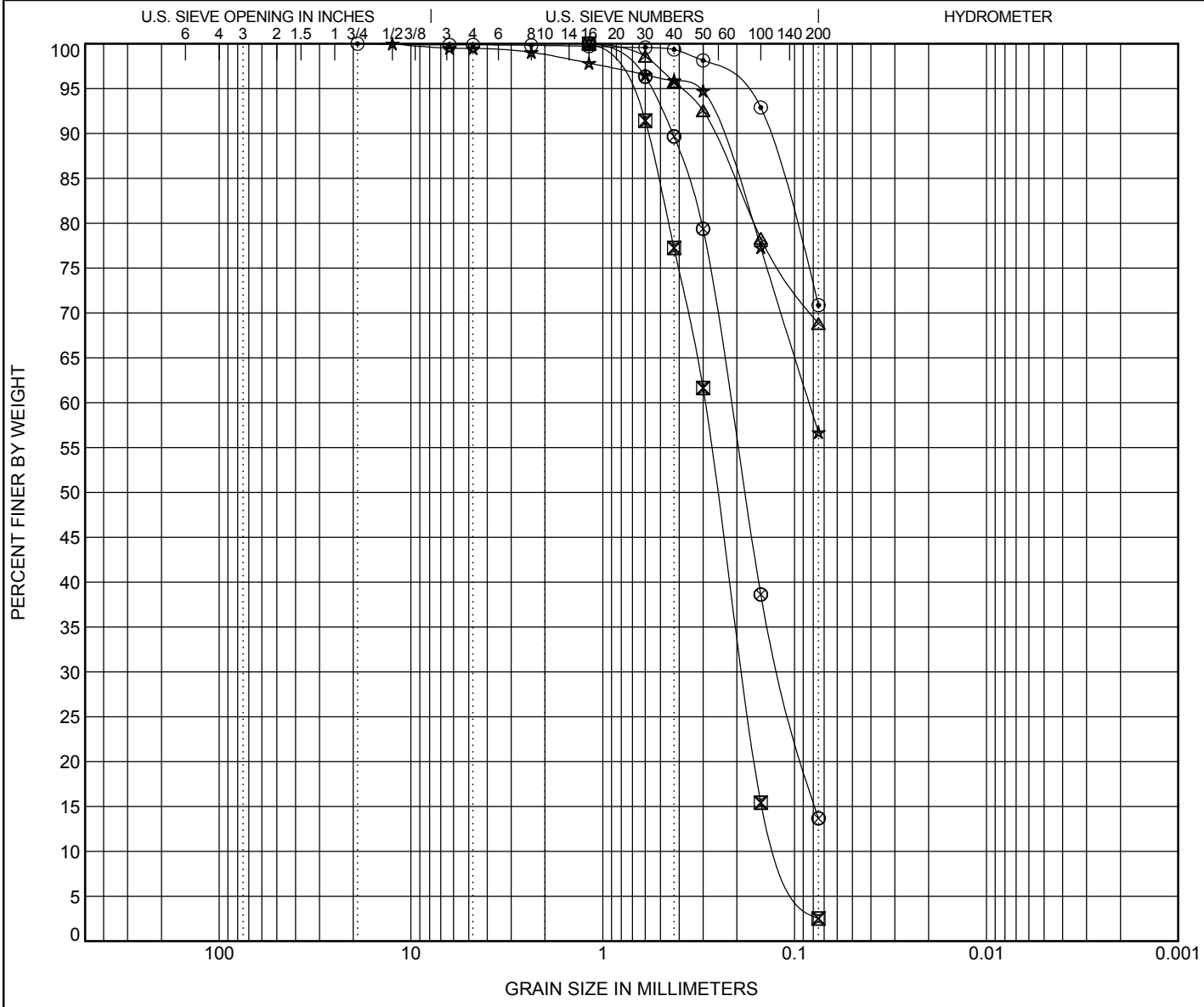
CLIENT GKW Architects **PROJECT NAME** Oakley Residential Subdivision

PROJECT NUMBER 11-1062 **PROJECT LOCATION** 2480 Oakley Road, Oakley



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	LL	PL	PI	Cc	Cu
⊗	B-3	Depth: 4.5'	Silty SAND (SM)					
⊠	B-3	Depth: 9.5'	Poorly Graded SAND (SP)				1.06	2.61
◬	B-3	Depth: 14.5'	Sandy SILT (ML)					
★	B-3	Depth: 24.5'	Sandy SILT (ML)					
⊙	B-3	Depth: 29.5'	Sandy SILT (ML)					

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
⊗	B-3	Depth: 4.5'	1.18	0.216	0.118		0.0	86.3	13.7	
⊠	B-3	Depth: 9.5'	1.18	0.293	0.187	0.112	0.0	97.5	2.5	
◬	B-3	Depth: 14.5'	1.18				0.0	31.2	68.8	
★	B-3	Depth: 24.5'	12.5	0.084			0.5	42.8	56.7	
⊙	B-3	Depth: 29.5'	19				0.1	29.0	70.9	

GRAIN SIZE DISTRIBUTION

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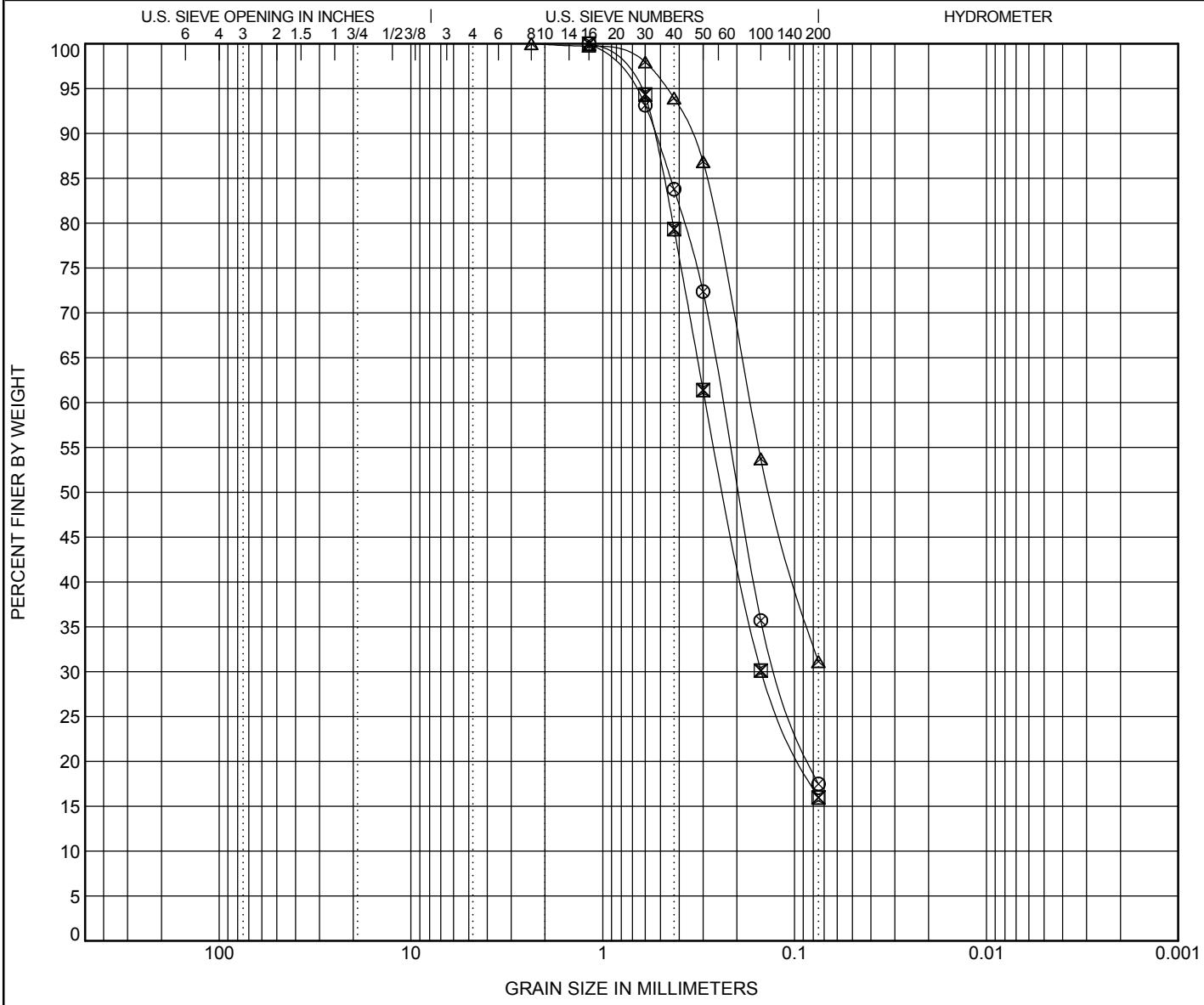
CLIENT GKW Architects **PROJECT NAME** Oakley Residential Subdivision

PROJECT NUMBER 11-1062 **PROJECT LOCATION** 2480 Oakley Road, Oakley



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	LL	PL	PI	Cc	Cu
⊗	B-4	Depth: 2.0'	Silty SAND (SM)					
⊠	B-4	Depth: 14.5'	Silty SAND (SM)					
△	B-4	Depth: 19.5'	Silty SAND (SM)					

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
⊗	B-4	Depth: 2.0'	1.18	0.237	0.121		0.0	82.5	17.5	
⊠	B-4	Depth: 14.5'	1.18	0.291	0.149		0.0	84.0	16.0	
△	B-4	Depth: 19.5'	2.36	0.171			0.0	68.9	31.1	

APPENDIX C

LIQUFACTION ANALYSIS

SPT BASED LIQUEFACTION ANALYSIS REPORT

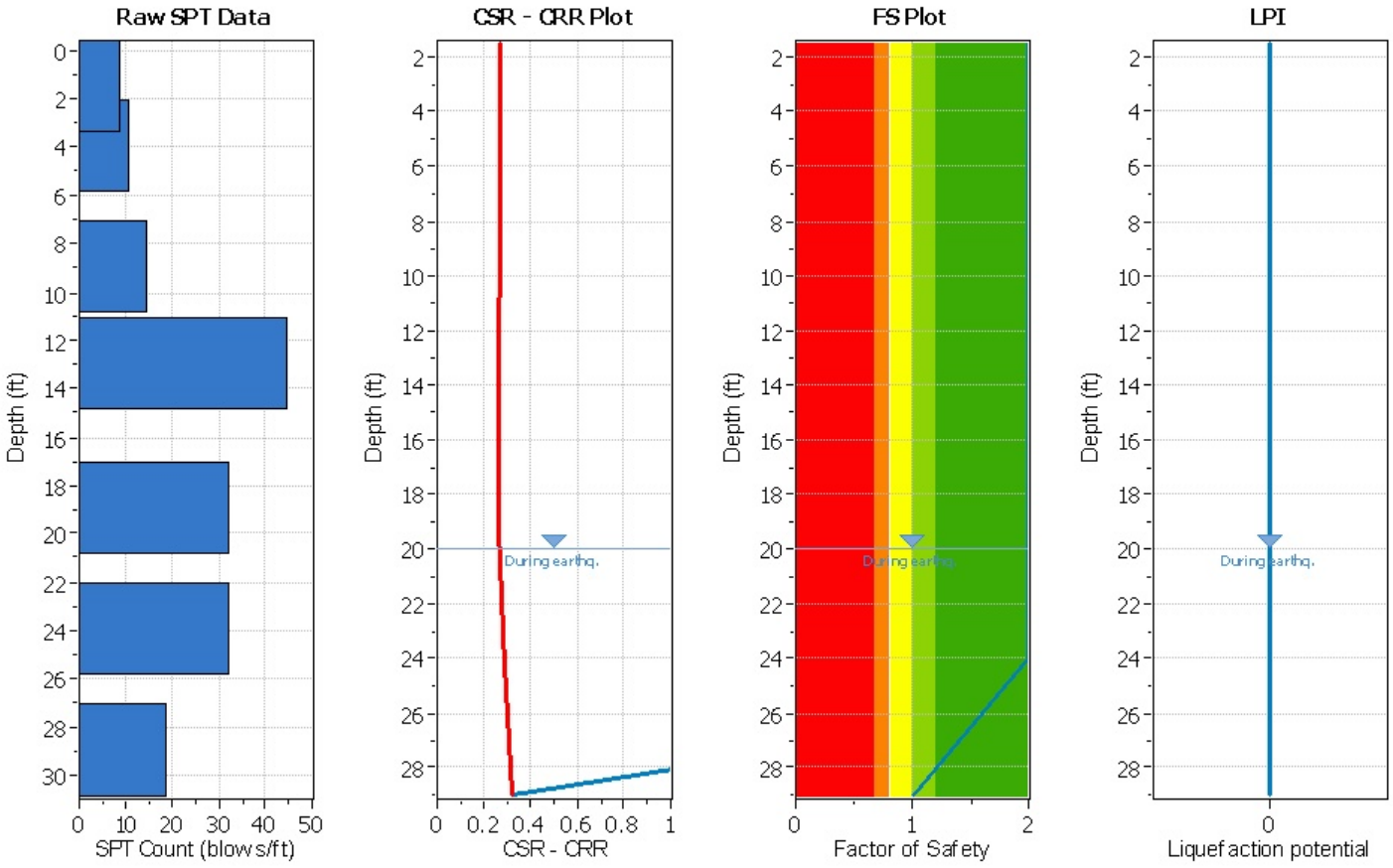
Project title : 2480 Oakley Road

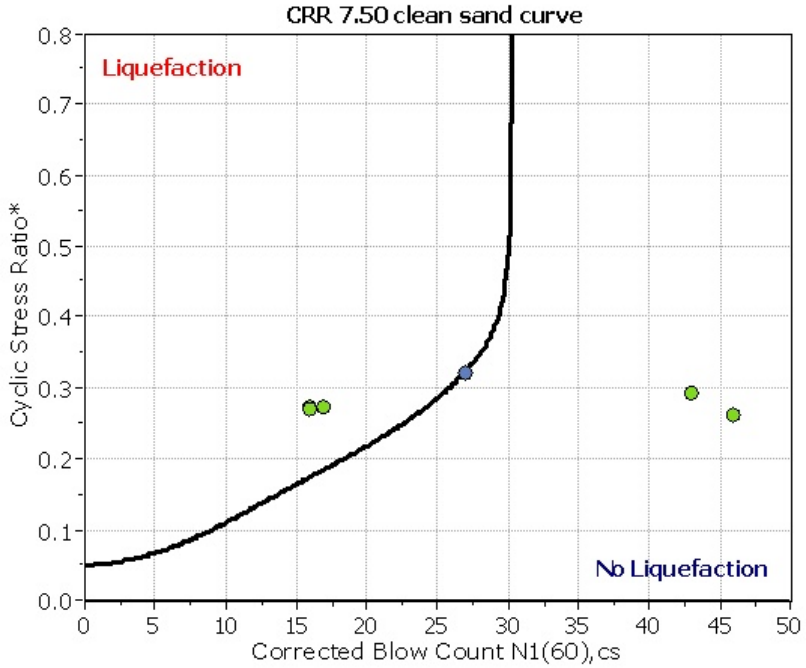
SPT Name: SPT #3

Location :

:: Input parameters and analysis properties ::

Analysis method:	NCEER 1998	G.W.T. (in-situ):	20.00 ft
Fines correction method:	NCEER 1998	G.W.T. (earthq.):	20.00 ft
Sampling method:	Standard Sampler	Earthquake magnitude M_w:	7.00 ft
Borehole diameter:	65mm to 115mm	Peak ground acceleration:	0.50 g
Rod length:	3.30 ft	Eq. external load:	0.00 tsf
Hammer energy ratio:	1.10		





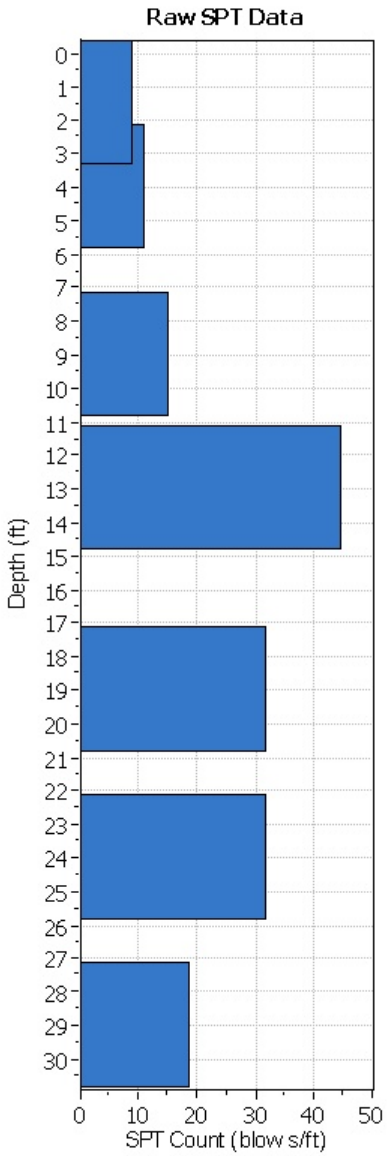
F.S. color scheme

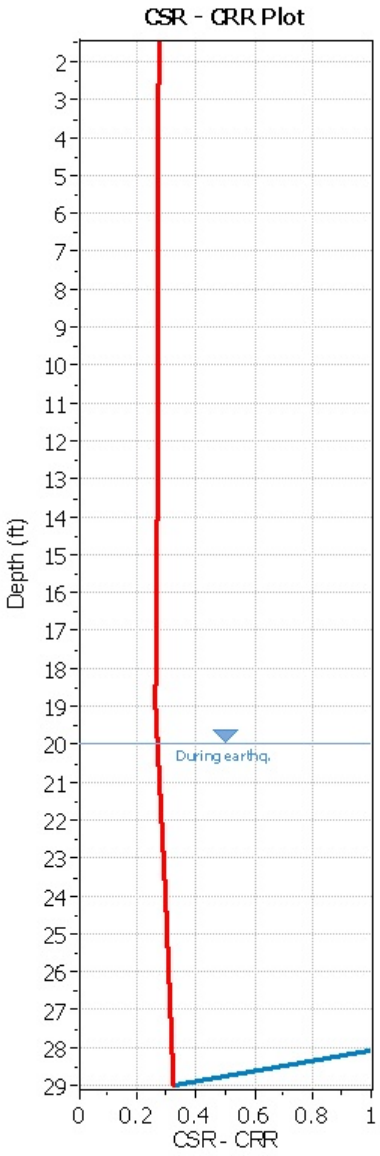
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

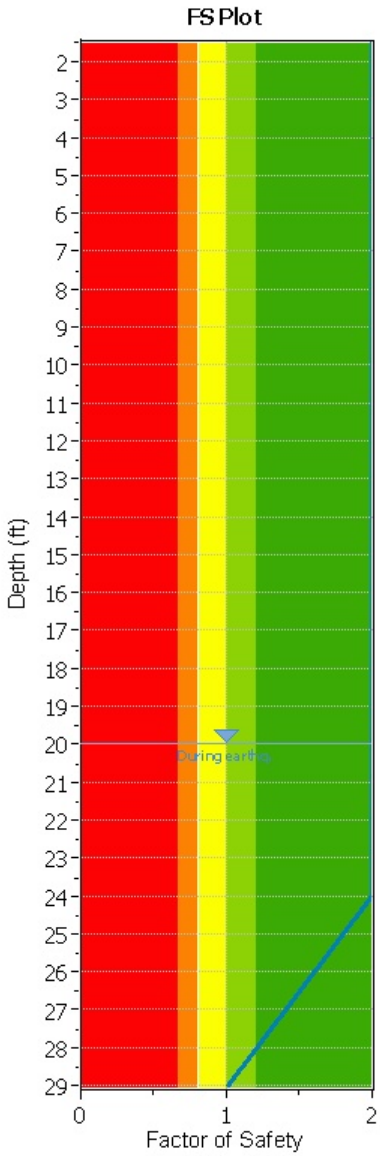
LPI color scheme

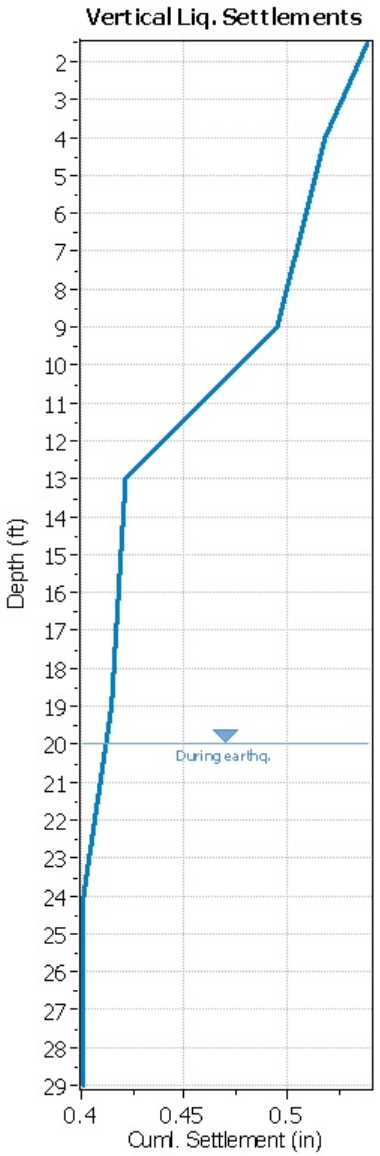
- Very high risk
- High risk
- Low risk

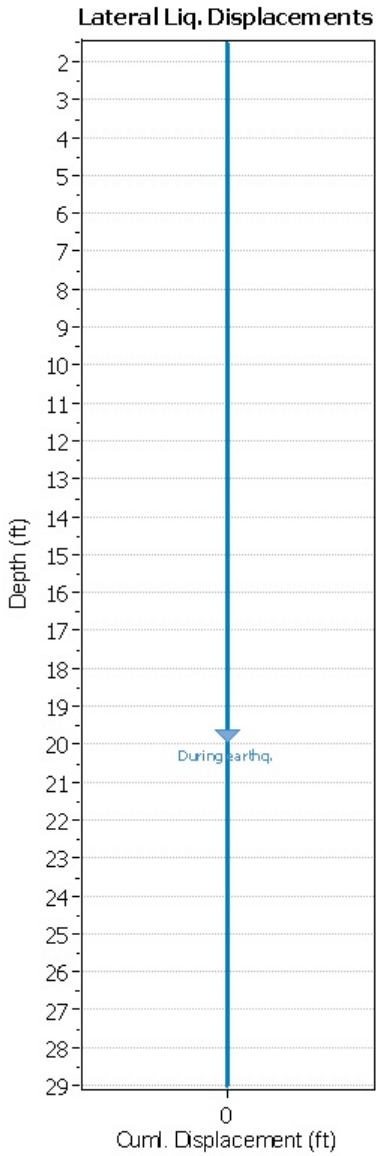
:: Overall Liquefaction Assessment Analysis Plots ::











:: Field input data ::

Test Depth (ft)	SPT Field Value (blows)	Fines Content (%)	Unit Weight (pcf)	Infl. Thickness (ft)	Can Liquefy
1.50	9	14.00	110.00	2.50	Yes
4.00	11	14.00	110.00	2.50	Yes
9.00	15	3.00	110.00	5.00	Yes
13.00	45	69.00	110.00	5.00	Yes
19.00	32	69.00	110.00	5.00	Yes
24.00	32	57.00	110.00	5.00	Yes
29.00	19	71.00	110.00	5.00	Yes

Abbreviations

Depth: Depth at which test was performed (ft)
SPT Field Value: Number of blows per foot
Fines Content: Fines content at test depth (%)
Unit Weight: Unit weight at test depth (pcf)
Infl. Thickness: Thickness of the soil layer to be considered in settlements analysis (ft)
Can Liquefy: User defined switch for excluding/including test depth from the analysis procedure

:: Cyclic Resistance Ratio (CRR) calculation data ::

Depth (ft)	SPT Field Value	Unit Weight (pcf)	σ_v (tsf)	u_o (tsf)	σ'_{vo} (tsf)	C_N	C_E	C_B	C_R	C_S	$(N_1)_{60}$	Fines Content (%)	α	β	$(N_1)_{60cs}$	$CRR_{7.5}$
1.50	9	110.00	0.08	0.00	0.08	1.70	1.10	1.00	0.75	1.00	13	14.00	2.20	1.04	16	4.000
4.00	11	110.00	0.22	0.00	0.22	1.56	1.10	1.00	0.75	1.00	14	14.00	2.20	1.04	17	4.000
9.00	15	110.00	0.49	0.00	0.49	1.32	1.10	1.00	0.75	1.00	16	3.00	0.00	1.00	16	4.000
13.00	45	110.00	0.71	0.00	0.71	1.17	1.10	1.00	0.85	1.00	49	69.00	5.00	1.20	64	4.000
19.00	32	110.00	1.04	0.00	1.04	1.01	1.10	1.00	0.95	1.00	34	69.00	5.00	1.20	46	4.000
24.00	32	110.00	1.32	0.12	1.20	0.94	1.10	1.00	0.95	1.00	32	57.00	5.00	1.20	43	4.000
29.00	19	110.00	1.59	0.28	1.31	0.90	1.10	1.00	0.95	1.00	18	71.00	5.00	1.20	27	0.323

Abbreviations

σ_v: Total stress during SPT test (tsf)
u_o: Water pore pressure during SPT test (tsf)
σ'_{vo}: Effective overburden pressure during SPT test (tsf)
C_N: Overburden corretion factor
C_E: Energy correction factor
C_B: Borehole diameter correction factor
C_R: Rod length correction factor
C_S: Liner correction factor
$N_{1(60)}$: Corrected N_{SPT} to a 60% energy ratio
α, β: Clean sand equivalent clean sand formula coefficients
$N_{1(60)cs}$: Corected $N_{1(60)}$ value for fines content
$CRR_{7.5}$: Cyclic resistance ratio for M=7.5

:: Cyclic Stress Ratio calculation (CSR fully adjusted and normalized) ::

Depth (ft)	Unit Weight (pcf)	$\sigma_{v,eq}$ (tsf)	$u_{o,eq}$ (tsf)	$\sigma'_{vo,eq}$ (tsf)	r_d	α	CSR	MSF	$CSR_{eq,M=7.5}$	K_{sigma}	CSR^*	FS	
1.50	110.00	0.08	0.00	0.08	1.00	1.00	0.325	1.19	0.272	1.00	0.272	2.000	●
4.00	110.00	0.22	0.00	0.22	0.99	1.00	0.323	1.19	0.270	1.00	0.270	2.000	●
9.00	110.00	0.49	0.00	0.49	0.98	1.00	0.319	1.19	0.267	1.00	0.267	2.000	●
13.00	110.00	0.71	0.00	0.71	0.97	1.00	0.316	1.19	0.265	1.00	0.265	2.000	●
19.00	110.00	1.04	0.00	1.04	0.96	1.00	0.312	1.19	0.261	1.00	0.261	2.000	●
24.00	110.00	1.32	0.12	1.20	0.95	1.00	0.339	1.19	0.284	0.98	0.291	2.000	●
29.00	110.00	1.59	0.28	1.31	0.93	1.00	0.365	1.19	0.306	0.96	0.320	1.011	●

:: Cyclic Stress Ratio calculation (CSR fully adjusted and normalized) ::

Depth (ft)	Unit Weight (pcf)	$\sigma_{v,eq}$ (tsf)	$u_{o,eq}$ (tsf)	$\sigma'_{vo,eq}$ (tsf)	r_d	a	CSR	MSF	$CSR_{eq,M=7.5}$	K_{sigma}	CSR^*	FS

Abbreviations

$\sigma_{v,eq}$: Total overburden pressure at test point, during earthquake (tsf)
$u_{o,eq}$: Water pressure at test point, during earthquake (tsf)
$\sigma'_{vo,eq}$: Effective overburden pressure, during earthquake (tsf)
r_d : Nonlinear shear mass factor
a: Improvement factor due to stone columns
CSR : Cyclic Stress Ratio (adjusted for improvement)
MSF : Magnitude Scaling Factor
$CSR_{eq,M=7.5}$: CSR adjusted for M=7.5
K_{sigma}: Effective overburden stress factor
CSR^*: CSR fully adjusted
FS: Calculated factor of safety against soil liquefaction

:: Liquefaction potential according to Iwasaki ::

Depth (ft)	FS	F	wz	Thickness (ft)	I_L
1.50	2.000	0.00	9.77	2.50	0.00
4.00	2.000	0.00	9.39	2.50	0.00
9.00	2.000	0.00	8.63	5.00	0.00
13.00	2.000	0.00	8.02	4.00	0.00
19.00	2.000	0.00	7.10	6.00	0.00
24.00	2.000	0.00	6.34	5.00	0.00
29.00	1.011	0.00	5.58	5.00	0.00

Overall potential I_L : 0.00

I_L = 0.00 - No liquefaction
I_L between 0.00 and 5 - Liquefaction not probable
I_L between 5 and 15 - Liquefaction probable
I_L > 15 - Liquefaction certain

:: Vertical settlements estimation for dry sands ::

Depth (ft)	$(N_1)_{60}$	τ_{av}	p	G_{max} (tsf)	a	b	γ	ε_{15}	N_c	ε_{Nc} (%)	Δh (ft)	ΔS (in)
1.50	13	0.03	0.06	0.26	0.13	28596.15	0.00	0.00	10.85	0.03	2.50	0.020
4.00	14	0.07	0.15	0.44	0.13	15875.46	0.00	0.00	10.85	0.04	2.50	0.024
9.00	16	0.16	0.33	0.65	0.14	9759.26	0.00	0.00	10.85	0.06	5.00	0.073
13.00	49	0.23	0.48	1.24	0.15	7827.02	0.00	0.00	10.85	0.01	5.00	0.007
19.00	34	0.33	0.70	1.34	0.16	6233.19	0.00	0.00	10.85	0.01	5.00	0.014

Cumulative settlemetns: 0.138

Abbreviations

τ_{av}: Average cyclic shear stress
p: Average stress
G_{max}: Maximum shear modulus (tsf)
a, b: Shear strain formula variables
γ: Average shear strain
ε_{15}: Volumetric strain after 15 cycles
N_c: Number of cycles
ε_{Nc}: Volumetric strain for number of cycles N_c (%)
Δh: Thickness of soil layer (in)
ΔS: Settlement of soil layer (in)

:: Vertical settlements estimation for saturated sands ::

Depth (ft)	D_{50} (in)	q_c/N	e_v (%)	Δh (ft)	s (in)
24.00	0.00	5.00	0.00	5.00	0.000
29.00	0.00	5.00	0.67	5.00	0.401

Cumulative settlements: 0.401

Abbreviations

D_{50}: Median grain size (in)
q_c/N: Ratio of cone resistance to SPT
e_v: Post liquefaction volumetric strain (%)
Δh: Thickness of soil layer to be considered (ft)
s: Estimated settlement (in)

:: Lateral displacements estimation for saturated sands ::

Depth (ft)	$(N_1)_{60}$	D_r (%)	γ_{max} (%)	d_z (ft)	LDI	LD (ft)
1.50	13	50.48	0.00	2.50	0.000	0.00
4.00	14	52.38	0.00	2.50	0.000	0.00
9.00	16	56.00	0.00	5.00	0.000	0.00
13.00	49	100.00	0.00	5.00	0.000	0.00
19.00	34	81.63	0.00	5.00	0.000	0.00
24.00	32	79.20	0.00	5.00	0.000	0.00
29.00	18	59.40	3.41	5.00	0.000	0.00

Cumulative lateral displacements: 0.00

Abbreviations

D_r: Relative density (%)
γ_{max}: Maximum amplitude of cyclic shear strain (%)
d_z: Soil layer thickness (ft)
LDI: Lateral displacement index (ft)
LD: Actual estimated displacement (ft)

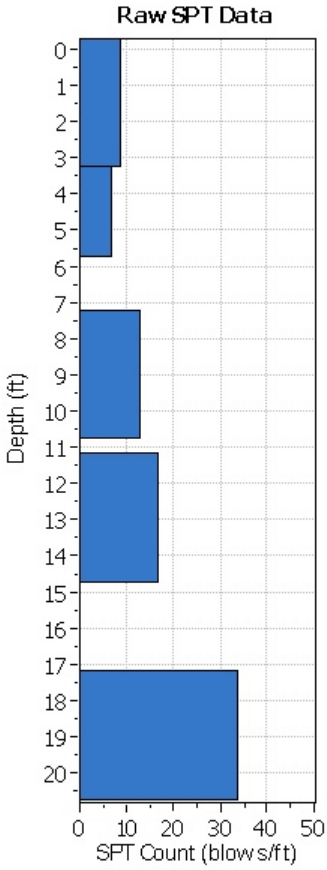
SPT BASED LIQUEFACTION ANALYSIS REPORT

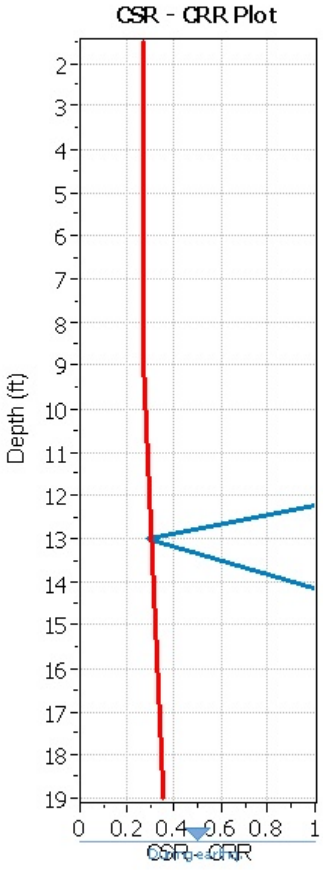
Project title : 2480 Oakley Road **SPT Name: SPT #4**

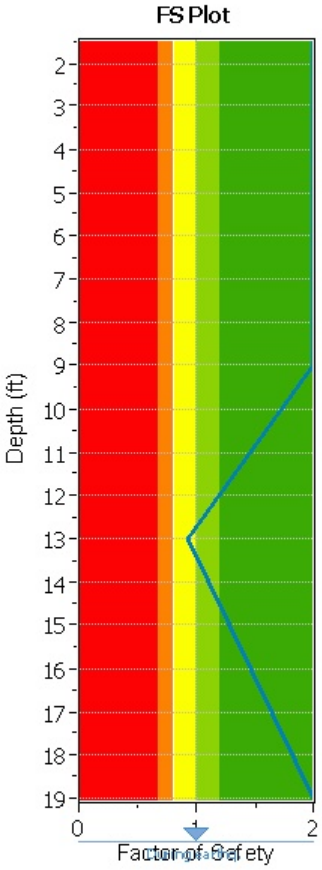
Location :

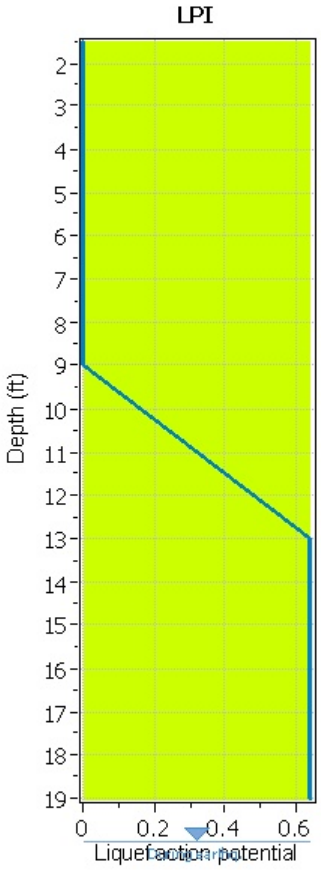
:: Input parameters and analysis properties ::

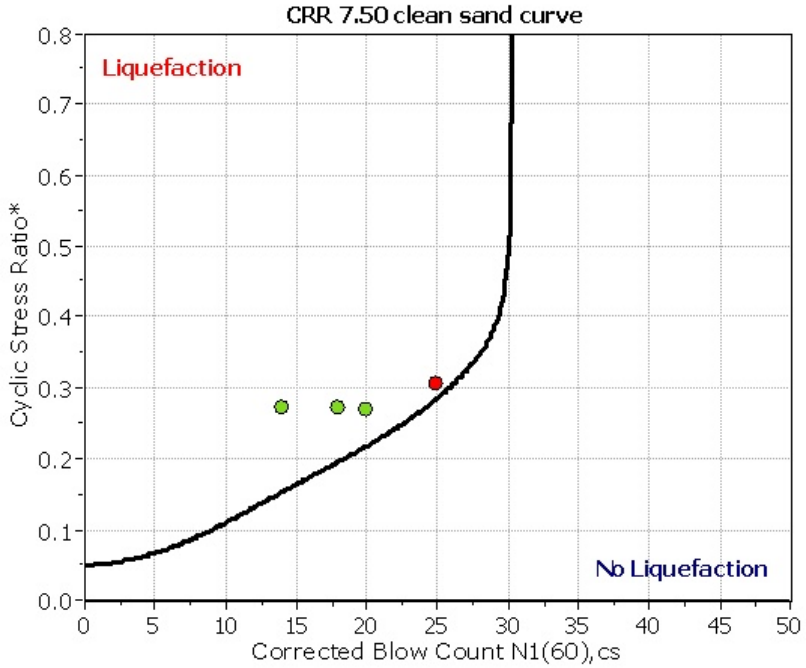
Analysis method:	NCEER 1998	G.W.T. (in-situ):	20.00 ft
Fines correction method:	NCEER 1998	G.W.T. (earthq.):	20.00 ft
Sampling method:	Standard Sampler	Earthquake magnitude M_w:	7.00 ft
Borehole diameter:	65mm to 115mm	Peak ground acceleration:	0.50 g
Rod length:	3.30 ft	Eq. external load:	0.00 tsf
Hammer energy ratio:	1.10		











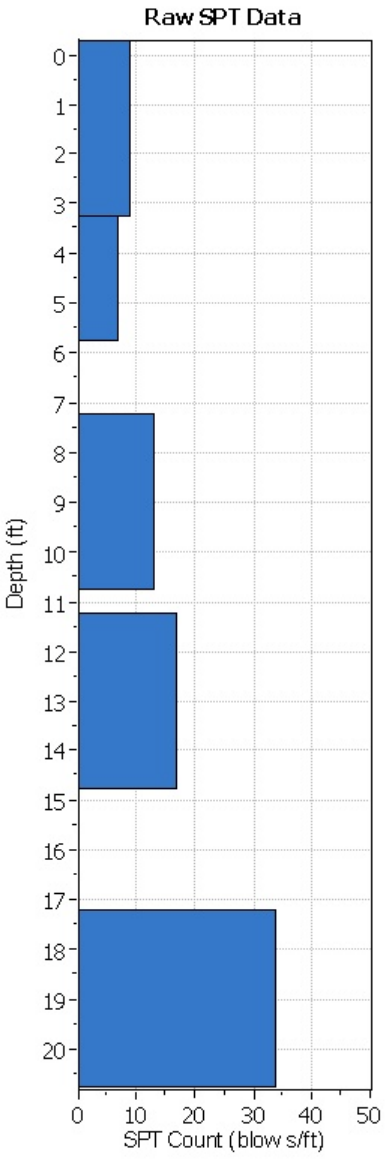
F.S. color scheme

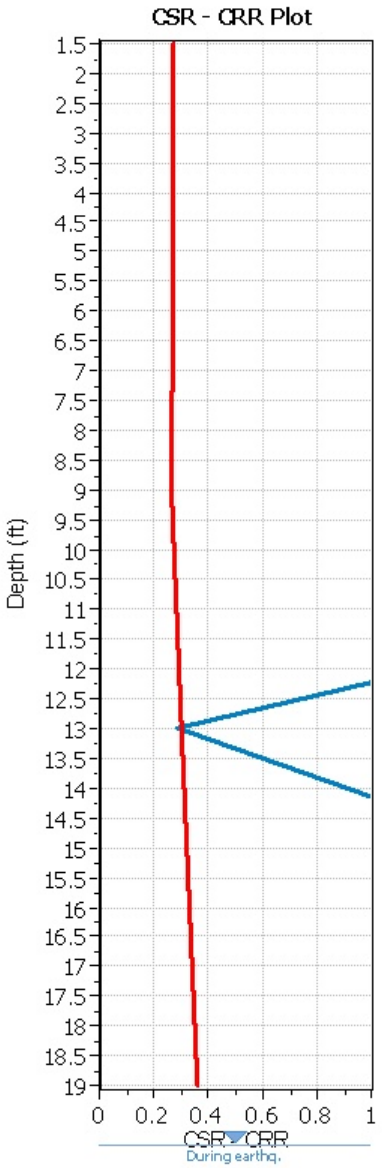
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

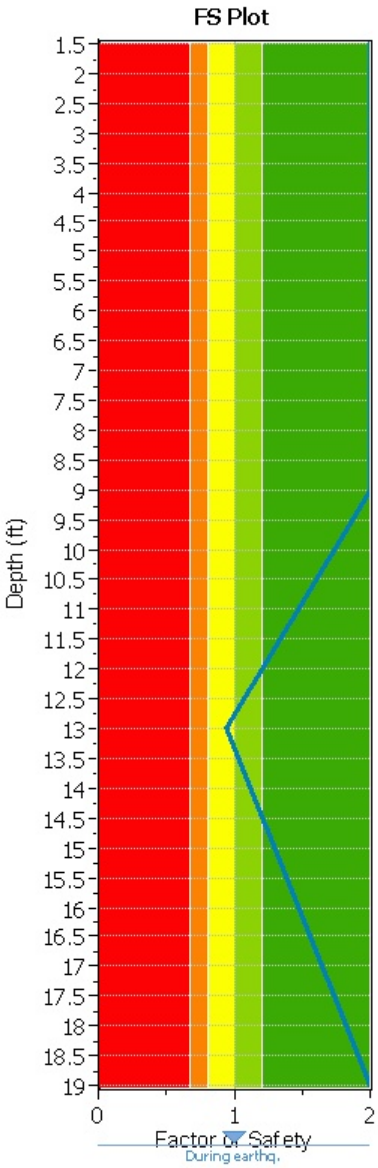
LPI color scheme

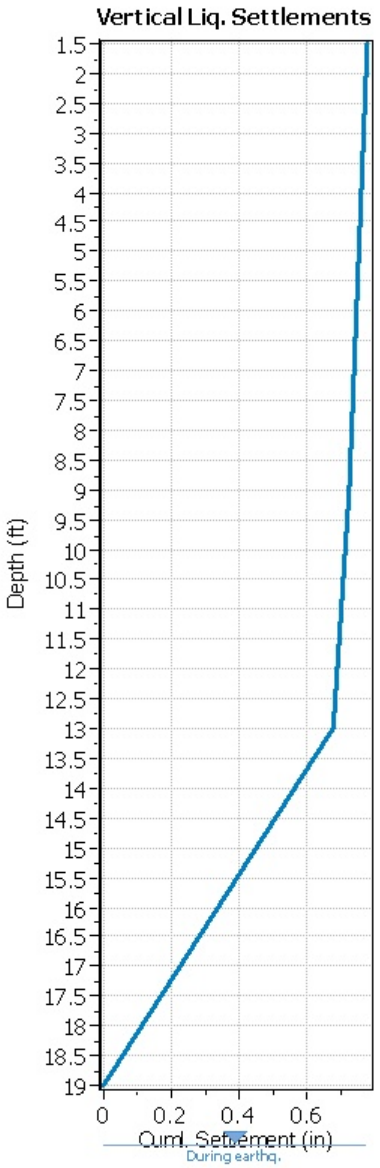
- Very high risk
- High risk
- Low risk

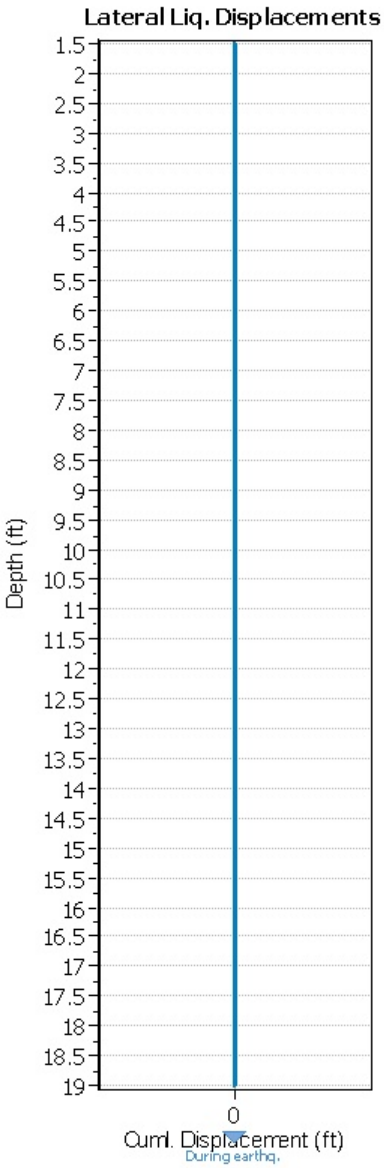
:: Overall Liquefaction Assessment Analysis Plots ::











:: Field input data ::

Test Depth (ft)	SPT Field Value (blows)	Fines Content (%)	Unit Weight (pcf)	Infl. Thickness (ft)	Can Liquefy
1.50	9	17.00	110.00	2.50	Yes
4.00	7	17.00	110.00	2.50	Yes
9.00	13	17.00	110.00	5.00	Yes
13.00	17	16.00	110.00	5.00	Yes
19.00	34	31.00	110.00	5.00	Yes

Abbreviations

Depth: Depth at which test was performed (ft)
SPT Field Value: Number of blows per foot
Fines Content: Fines content at test depth (%)
Unit Weight: Unit weight at test depth (pcf)
Infl. Thickness: Thickness of the soil layer to be considered in settlements analysis (ft)
Can Liquefy: User defined switch for excluding/including test depth from the analysis procedure

:: Cyclic Resistance Ratio (CRR) calculation data ::

Depth (ft)	SPT Field Value	Unit Weight (pcf)	σ_v (tsf)	u_o (tsf)	σ'_{vo} (tsf)	C_N	C_E	C_B	C_R	C_S	$(N_1)_{60}$	Fines Content (%)	α	β	$(N_1)_{60cs}$	$CRR_{7.5}$
1.50	9	110.00	0.08	0.00	0.08	1.70	1.20	1.05	0.75	1.00	14	17.00	3.01	1.06	18	4.000
4.00	7	110.00	0.22	0.00	0.22	1.56	1.20	1.05	0.75	1.00	10	17.00	3.01	1.06	14	4.000
9.00	13	110.00	0.49	0.00	0.49	1.32	1.20	1.05	0.75	1.00	16	17.00	3.01	1.06	20	4.000
13.00	17	110.00	0.71	0.00	0.71	1.17	1.20	1.05	0.85	1.00	21	16.00	2.77	1.05	25	0.285
19.00	34	110.00	1.04	0.00	1.04	1.01	1.20	1.05	0.95	1.00	41	31.00	4.77	1.16	52	4.000

Abbreviations

σ_v: Total stress during SPT test (tsf)
u_o: Water pore pressure during SPT test (tsf)
σ'_{vo}: Effective overburden pressure during SPT test (tsf)
C_N: Overburden corretion factor
C_E: Energy correction factor
C_B: Borehole diameter correction factor
C_R: Rod length correction factor
C_S: Liner correction factor
$N_{1(60)}$: Corrected N_{SPT} to a 60% energy ratio
α, β: Clean sand equivalent clean sand formula coefficients
$N_{1(60)cs}$: Corected $N_{1(60)}$ value for fines content
$CRR_{7.5}$: Cyclic resistance ratio for M=7.5

:: Cyclic Stress Ratio calculation (CSR fully adjusted and normalized) ::

Depth (ft)	Unit Weight (pcf)	$\sigma_{v,eq}$ (tsf)	$u_{o,eq}$ (tsf)	$\sigma'_{vo,eq}$ (tsf)	r_d	α	CSR	MSF	$CSR_{eq,M=7.5}$	K_{sigma}	CSR^*	FS	
1.50	110.00	0.08	0.00	0.08	1.00	1.00	0.325	1.19	0.272	1.00	0.272	2.000	●
4.00	110.00	0.22	0.00	0.22	0.99	1.00	0.323	1.19	0.270	1.00	0.270	2.000	●
9.00	110.00	0.49	0.00	0.49	0.98	1.00	0.319	1.19	0.267	1.00	0.267	2.000	●
13.00	110.00	0.71	0.09	0.62	0.97	1.00	0.364	1.19	0.305	1.00	0.305	0.935	●
19.00	110.00	1.04	0.28	0.76	0.96	1.00	0.426	1.19	0.357	1.00	0.357	2.000	●

:: Cyclic Stress Ratio calculation (CSR fully adjusted and normalized) ::

Depth (ft)	Unit Weight (pcf)	$\sigma_{v,eq}$ (tsf)	$u_{o,eq}$ (tsf)	$\sigma'_{vo,eq}$ (tsf)	r_d	α	CSR	MSF	$CSR_{eq,M=7.5}$	K_{sigma}	CSR^*	FS

Abbreviations

$\sigma_{v,eq}$: Total overburden pressure at test point, during earthquake (tsf)
$u_{o,eq}$: Water pressure at test point, during earthquake (tsf)
$\sigma'_{vo,eq}$: Effective overburden pressure, during earthquake (tsf)
r_d : Nonlinear shear mass factor
α: Improvement factor due to stone columns
CSR : Cyclic Stress Ratio (adjusted for improvement)
MSF : Magnitude Scaling Factor
$CSR_{eq,M=7.5}$: CSR adjusted for M=7.5
K_{sigma}: Effective overburden stress factor
CSR^*: CSR fully adjusted
FS: Calculated factor of safety against soil liquefaction

:: Liquefaction potential according to Iwasaki ::

Depth (ft)	FS	F	wz	Thickness (ft)	I_L
1.50	2.000	0.00	9.77	2.50	0.00
4.00	2.000	0.00	9.39	2.50	0.00
9.00	2.000	0.00	8.63	5.00	0.00
13.00	0.935	0.07	8.02	4.00	0.64
19.00	2.000	0.00	7.10	6.00	0.00

Overall potential I_L : 0.64

I_L = 0.00 - No liquefaction
I_L between 0.00 and 5 - Liquefaction not probable
I_L between 5 and 15 - Liquefaction probable
I_L > 15 - Liquefaction certain

:: Vertical settlements estimation for dry sands ::

Depth (ft)	$(N_1)_{60}$	τ_{av}	p	G_{max} (tsf)	α	b	γ	ε_{15}	N_c	ε_{Nc} (%)	Δh (ft)	ΔS (in)
1.50	14	0.03	0.06	0.28	0.13	28596.15	0.00	0.00	10.85	0.03	2.50	0.015
4.00	10	0.07	0.15	0.41	0.13	15875.46	0.00	0.00	10.85	0.06	2.50	0.036
9.00	16	0.16	0.33	0.70	0.14	9759.26	0.00	0.00	10.85	0.04	5.00	0.047
13.00	21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.000
19.00	41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.000

Cumulative settlemetns: 0.099

Abbreviations

τ_{av}: Average cyclic shear stress
p: Average stress
G_{max}: Maximum shear modulus (tsf)
a, b: Shear strain formula variables
γ: Average shear strain
ε_{15}: Volumetric strain after 15 cycles
N_c: Number of cycles
ε_{Nc}: Volumetric strain for number of cycles N_c (%)
Δh: Thickness of soil layer (in)
ΔS: Settlement of soil layer (in)

:: Lateral displacements estimation for saturated sands ::

Depth (ft)	$(N_1)_{60}$	D_r (%)	γ_{max} (%)	d_z (ft)	LDI	LD (ft)
1.50	14	52.38	0.00	2.50	0.000	0.00
4.00	10	44.27	0.00	2.50	0.000	0.00
9.00	16	56.00	0.00	5.00	0.000	0.00
13.00	21	64.16	4.83	5.00	0.000	0.00
19.00	41	89.64	0.00	5.00	0.000	0.00

Cumulative lateral displacements: 0.00

Abbreviations

D_r: Relative density (%)
γ_{max}: Maximum amplitude of cyclic shear strain (%)
d_z: Soil layer thickness (ft)
LDI: Lateral displacement index (ft)
LD: Actual estimated displacement (ft)

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APPENDIX D

TRAFFIC IMPACT ASSESSMENT MEMO

KD Anderson & Associates, Inc.
Transportation Engineers

April 30, 2019

Mr. Yoonho Oh
GKW ARCHITECTS
710 E. McGlincy Lane, Suite 109
Campbell, CA 95008

RE: TRAFFIC IMPACT ASSESSMENT FOR 22 LOT SUBDIVISION PROPOSED AT 2480 OAKLEY ROAD, OAKLEY, CALIFORNIA

Dear Mr. Oh:

Thank you for contacting KD Anderson & Associates (KDA) regarding preparation of the traffic impact assessment memo needed for the 2480 Oakley Road subdivision project in Oakley**.** As we understand the proposed project will occupy a vacant site on the north side of Oakley Road between Live Oak Avenue and Kelsey Lane. City of Oakley has asked for a focused traffic study which will identify the site's net trip generation increase, determine its additional traffic at adjoining intersections and evaluate the adequacy of the site's access. This letter summarizes the assessment we have completed to address the City's request.

Project Characteristics. The project site plan is attached as Figure 1. The amount of daily and weekday a.m./p.m. peak hour traffic associated with the proposed project has been estimated based on trip generation rates published by the Institute of Transportation Engineers (ITE) in their publication, *Trip Generation Manual, 10th Edition.* As noted in Table 1 below, the project is likely to result in 208 daily trips (1/2 inbound and 1/2 outbound) with 16 trips in the a.m. peak hour and 22 trips in the p.m. peak hour.

TABLE 1
TRIP GENERATION RATES / FORECASTS

Land Use	Unit / Quantity	Trip Generation						
			AM Peak Hour			PM Peak Hour		
		Daily	Inbound	Outbound	Total	Inbound	Outbound	Total
Single Family Residential	Dwelling unit	9.44	25%	75%	0.74	63%	37%	0.99
Proposed Project	22 du's	208	4	12	16	14	8	22

The project site plan indicates that the site has roughly 425 feet of frontage along Oakley Road. Two access intersections are proposed within that area. The more easterly access is 110 feet from the subdivision's eastern boundary and is generally aligned with an access proposed to a new subdivision on the south side of the street (The Vines at Oakley), as noted in Figure 2. The other access is 211 feet to the west.

Background Traffic Information. Oakley Road is identified as an Arterial in the City of Oakley General Plan Circulation Diagram. Today Oakley Road is a two-lane rural facility in the immediate area of the project. The long-term plan for Oakley Road is a four-lane divided street, and the roadway has been widened to this standard as development has proceeded in the area east of the project site. Today the raised median in Oakley Road ends about 130 feet east of the proposed project's eastern access (centerline). The speed limit on this segment of Oakley Road is 35 mph.

Traffic flow in this area of Oakley is governed by the operation of all-way stop controlled intersections on Oakley Road at Live Oak Avenue to the west of the project and at Beldin Ln/Kelsey Ln east of the project. The IS/MND prepared for The Villages at Main Street project indicates that today the Live Oak Avenue / Oakley Road intersection operates at LOS C in the a.m. peak hour and LOS A in the p.m. peak hour.

The segment of Oakley Road from Live Oak Avenue to Empire Avenue carries about 3,675 vehicles per day based on City count records.

Existing Plus Project Volumes. The volume of traffic added to various locations on the local area circulation system will depend on the level of access allowed. Initially, if the median on Oakley Road is not immediately extended westerly when the project is built, then full access could be permitted if sight distance is adequate. Based on the project's location in western Oakley but recognizing the location of access to SR 160 at Main Street and to SR 4 at Laurel Road we would expect trips to and from the subdivision to be split 50% to the east and 50% to the west. Figure 3 shows the resulting assignment of project trips with full access. As indicated, the project would add about 8 to 11 trips to the intersections beyond the site in each direction. This contribution would be too small to have a noticeable traffic impact.

Access Operation and Circulation. The project's access and circulation will be reviewed within the context of safety and design considerations, including:

- Interaction between access to other projects
- Sight distance for posted speed limit
- Feasibility of multiple access intersections

Interaction with other Access. As noted earlier another subdivision is planned immediately south of the proposed project. Because the access to that project and the proposed eastern access intersection align, the conflicts inherent to offset intersections are to a degree addressed. However, that southern driveway and the project's western driveway will be offset by 211 feet. Many communities have created standards for access offsets that are primarily based on stopping sighted distance. Typically, collector streets require a minimum of 150 feet of separation, which is the stopping sight distance at 25 mph. Larger streets often require 240 feet, which is the stopping sight distance at nearly 35 mph. The available separation in this case would lie between those two distances. Because the number of lots served by the project is low, the number of

vehicles using the western driveway is low. The driveway offset distance should be adequate on an interim basis until the raised median on Oakley Road is extended westerly and limits both sides to right-turn only.

Sight Distance. Caltrans' minimum stopping sight distance requirements are presented in Table 201.1 of the Highway Design Manual (HDM). The minimum sight distance at 35 mph is 250 feet. The extent to which that sight distance will be available from the location mandated in the HDM (i.e., 15 feet from the edge of travel lane) has been assessed at each driveway. That location has been determined assuming that the project will widen its ½ of Oakley Road to the 4-lane width. That improvement would provide room to extend the existing center median area westerly about 220 feet as a Two-Way Left-Turn (TWLT) lane. The second westbound travel lane that today ends about 175 feet east of the project could be extended for about 380 feet, and from that point the #1 westbound lane could transition back into the existing roadway centerline along the western half of the site to a point about 150 feet beyond the project's western property line. Within that context, the site line from the western access would originate about 35 feet from the existing centerline. Looking westerly it appears that the available sight distance will satisfy the minimum requirement once the vegetation along the project frontage is eliminated. Ideally, vegetation that extends beyond the fence line of the adjoining parcel in the public right of way should also be removed.

Multiple Driveways. From review of access to other recent development along similar roads it is apparent that the City of Oakley strives to limit the number of new driveways constructed along four lane streets in order to promote through traffic flow by minimizing the amount of "side friction" caused by local turning movements. In this case, eliminating one access would likely result in the loss of at least one residence. In this case, because the project generates relatively little traffic the overall effect of a second access would not be substantial, and the City could elect to permit the project with access as proposed.

Thank you for your attention to this information. Please feel free to contact me if you have any questions.

Please feel free to call me if you have any questions.

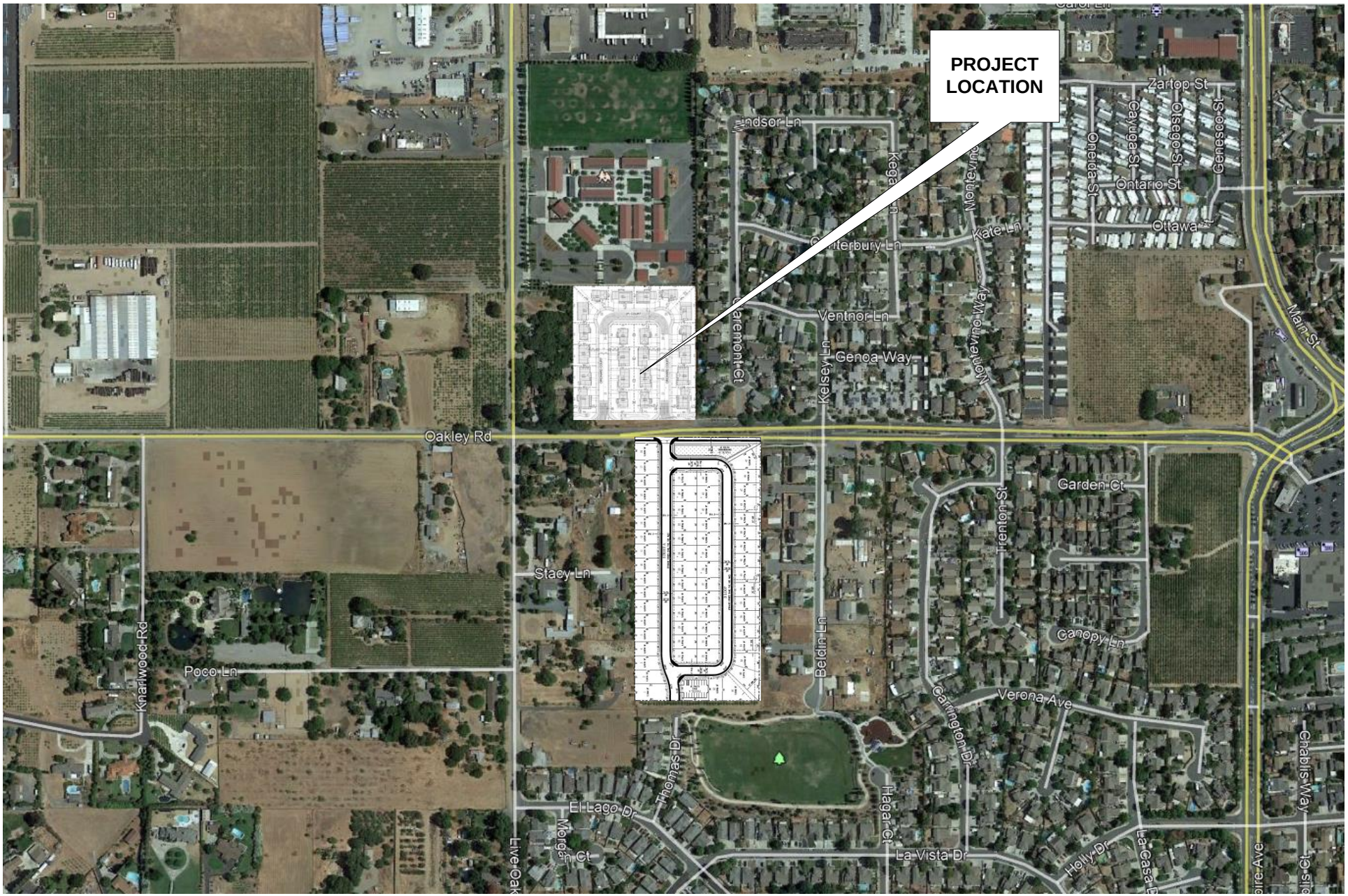
Sincerely yours,

KD Anderson & Associates, Inc.

Kenneth D. Anderson, P.E.
President

Attachments: Figures

KDA



VICINITY MAP

KD Anderson & Associates, Inc.
Transportation Engineers

3460-01 RA 5/1/2019

figure 1

PROJECT INTENT

THE INTENT OF THE PROJECT IS TO CONSTRUCTED A SUSTAINABLE PLANNED DEVELOPMENT IN ACCORDANCE WITH THE CITY OF OAKLEY.

THE PROJECT AIMS TO REZONE FROM LI TO R6.

THE PROJECT PROPOSES A PLANNED DEVELOPMENT OF 22 SINGLE FAMILY RESIDENTIAL TO COMPLY WITH REQUIRED CODES AND REGULATIONS OF THE CITY OF OAKLEY.

PROJECT SCOPE

1. APPLY FOR A PLANNED DEVELOPMENT PROJECT
2. REZONE FROM LI TO R6
3. PROPOSE NEW LANDSCAPE
4. PROPOSE 22 LOTS, EACH WITH TYPICAL HOUSING UNIT, GARAGE, DRIVEWAY, YARDS
5. PROPOSE ROAD AND SIDEWALK
6. PROPOSE STORM WATER CONTROL MANAGEMENT
7. SUSTAINABLE GREEN AMENITIES

PROJECT SUMMARY

ARCHITECT:	GKW ARCHITECTS, INC. GORDON K WONG, AIA, LEED GA, CSLB 710 E MCGLINCY LANE SUITE 109, CAMPBELL, CA 95008 408-315-2125 | GORDONKWONG@GKWARCHITECTS.COM
CLIENT:	OAKLEY ROAD PARTNERS, LLC
ADDRESS:	2480 OAKLEY ROAD, OAKLEY CA 94561
APN:	037-100-043-1
JURISDICTION:	CITY OF OAKLEY, CALIFORNIA
LOT SIZE:	4.604 ACRE (200,550.24 SF)
(E) GENERAL LAND USE:	LI (LIGHT INDUSTRIAL)
(E) ZONING:	LI (LIGHT INDUSTRIAL)
(E) OCCUPANCY:	N/A
(E) USE:	N/A
PROPOSED ZONE:	P-1 (PLANNED DEVELOPMENT) / R-6
PROPOSED USE:	22 SINGLE FAMILY RESIDENTIAL
AUTO-SPRINKLER SYSTEM:	NO
TYPE OF CONSTRUCTION:	TYPE V-B
MAXIMUM LOT COVERAGE:	N/A
PROPOSED SUBDIVISION:	22 LOTS
DENSITY ALLOWED:	N/A: 6,000 SF MIN. LOT SIZE REQUIREMENT
SETBACKS	
FRONT:	20'
SECONDARY FRONT:	15'
REAR:	15'
AGGREGATE WIDTH SIDE YARD:	15'
WIDTH OF ONE SIDE:	5'
2ND FLOOR SIDE:	ADDITIONAL 5'
CORNER SIDE:	15'
GARAGE:	20'
2 STORY MIN:	15'
R-6 MIN LOT REQ.:	6,000 SF
MIN. WIDTH:	60'
MIN. DEPTH:	80'
MAX. HEIGHT:	2 STORIES, 30'
GARAGE DIMENSIONS:	2 CAR: 18' X 19' 3 CAR: 27' X 19'
GARAGE CONFIGURATIONS:	• DE-EMPHASIZE GARAGE • AT LEAST 20% OF RESIDENCES IN A DEVELOPMENT SHALL HAVE GARAGES WHICH EITHER DO NOT FACE THE STREET OR HAVE A MIN. OF 30' FRONT SETBACK TO GARAGE • FRONT-FACING GARAGE DOOR WIDTH SHALL BE A MAX. OF 50% OF ELEVATION WIDTH • DRIVEWAY TO BE MAX. OF 25% OF LOT FRONTAGE WIDTH • 18' DRIVE WAY WIDTH ALLOWABLE FOR TWO CAR DRIVE ON ANY LOT • FRONT-FACING GARAGE DOOR SHALL BE RECESSED AT LEAST 3' BEHIND FRONT ELEVATION
ACCESSORY STRUCTURES:	IN REAR YARDS :OCCUPY MAX. 30% OF REQUIRED REAR YARD
MECHANICAL EQUIPMENT IN YARD:	GROUND-MOUNTED MECHANICAL EQUIP. SHALL BE SCREENED FROM VIEW WITH LANDSCAPE OR FENCING, AND PROVIDE MIN. 3' OF HORIZONTAL CLEARANCE ON AT LEAST ONE SIDE

DESIGN GUIDELINES

RESIDENTIAL DESIGN GUIDELINES:

NEIGHBORHOOD COMPONENTS
- DISTINCT ENTRY TO NEIGHBORHOOD
- PROVIDE OPEN SPACE: RECREATIONAL USES
- CONNECT WITH SURROUNDING COMMUNITY: PEDESTRIAN AND BICYCLE
- DEFINE THE NEIGHBORHOOD WITH CLEAR EDGES: NATURAL, LANDSCAPE, AND/OR ATTRACTIVE WALL
- INCORPORATE ENERGY AND RESOURCE EFFICIENT DESIGN

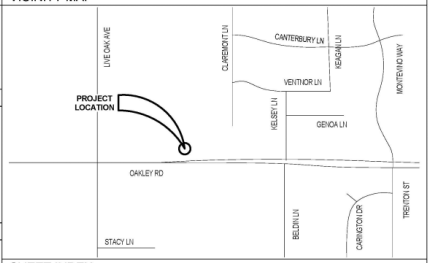
RESIDENTIAL AND LOT DESIGN
- LOT SIZE VARIATION: EXCEED MINIMUM REQUIRED DIMENSIONS
- VARY SETBACKS ALONG STREET FRONTAGE: NOT MORE THAN 2 ADJACENT HOMES OF SAME SETBACK

NEIGHBORHOOD COLLECTOR AND LOCAL STREETS:
- SIDEWALK: MONOLITHIC 5 FEET WITH CURB
- WHERE HOUSES FRONT ONTO LOCAL STREET, PLANT A MIN. OF ONE STREET TREE PER LOT WITHIN 5 FEET OF SIDEWALK
- WHERE SIDE OR REAR YARD ABUT LOCAL STREET, THERE SHALL BE A MIN. 5 FEET WIDE LANDSCAPE SETBACK BETWEEN SIDEWALK AND SIDE OR REAR YARD FENCE

TREE PALETTES FOR OAKLEY ROAD
- PRIMARY TREE: PISTACIA CHINENSIS (CHINESE PISTACHE)
- ALTERNATE TREE: QUERCUS AGRIFOLIA (COAST LIVE OAK)
- ACCENT TREE: PRUNUS SPECIES (FLOWERING CHERRY)

BUILDING MASS
- DIVERSITY BY VARYING BULK AND MASS OF BUILDINGS
- AT LEAST 20% OF UNITS WITHIN A SUBDIVISION SHALL BE SINGLE STORY
- NOT MORE THAN 25% OF UNITS MAY HAVE SAME TWO-STORY PLAN
- AT LEAST 50% OF CORNER LOTS IN A SUBDIVISION SHALL BE ONE-STORY UNITS.
- LOCATE DRIVEWAYS AWAY FROM THE CORNER TO REDUCE VISUAL PROMINENCE

VICINITY MAP



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A5.00	Architectural Details

PUBLIC WORKS & SITE PLAN NOTES

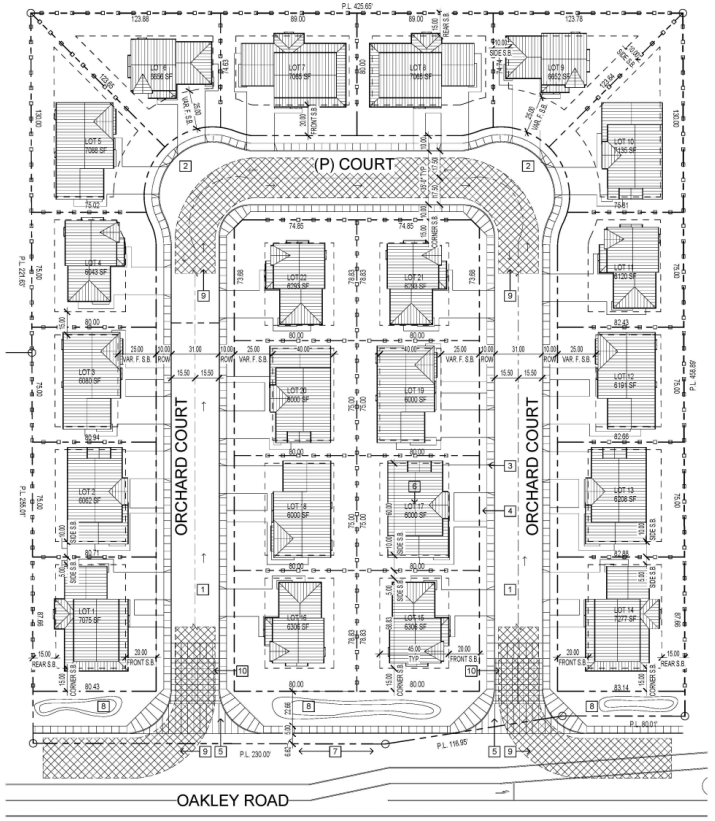
1. CONTRACTOR IS RESPONSIBLE FOR DUST CONTROL AND INSURING AREA ADJACENT TO WORK IS LEFT IN A CLEAN CONDITION.
2. UTILIZE BEST MANAGEMENT PRACTICES (BMPS), AS REQUIRED BY THE STATE WATER RESOURCES BOARD, FOR ANY ACTIVITY, WHICH DISTURBS SOIL.
3. CONTRACTOR SHALL SCRAPE ALL SMOKE OR FIRE DAMAGED MEMBERS CLEAN. ANY FRAMING MEMBERS THAT LOSE MORE THAN 1/16" OF MATERIAL PER SURFACE MUST BE REPLACED OR REPAIRED. SMOKE DAMAGED MEMBERS MUST BE CLEANED AND SEALED.
4. CONTRACTOR IS RESPONSIBLE FOR ALL TEST, INSPECTIONS AND PROCEDURAL REQUIREMENTS PER CITY OF OAKLEY.
5. OPERABLE SMOKE DETECTORS MUST BE IN PLACE PRIOR TO RE-OCCUPY DWELLINGS PER U.M.C. SECTION 17.20.540
6. PLUMBING & ELECTRICAL SURVEY REQUIRED FOR METER RELEASE.
7. ADDITIONS, ALTERATIONS OR REPAIRS SHALL CONFORM TO ANY BUILDING OR STRUCTURE WITHOUT REQUIRING THE EXISTING BUILDING OR STRUCTURE TO COMPLY WITH ALL THE REQUIREMENTS OF THE UBC, PROVIDED THE ADDITION ALTERATION OR REPAIR CONFORMS TO THAT REQUIRED FOR NEW BUILDING OR STRUCTURE PER UBC SECTION 3403.2.
8. CONTRACTOR TO VERIFY SIZE & LOCATION OF ALL UTILITY CONNECTIONS. CONTRACTOR TO PROVIDE ALL NEW UTILITY CONNECTIONS AND/OR UPGRADE EXISTING AS REQUIRED. CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND APPROVALS AS REQUIRED BY GOVERNING AGENCIES.
9. CONTRACTOR SHALL OBTAIN ALL NECESSARY DEMOLITION PERMITS AND APPROVALS INCLUDING ASBESTOS ABATEMENT AS PART OF THE BASE BID
10. PER CGBSC 301.1.1 - RESIDENTIAL BUILDINGS UNDERGOING PERMITTED ALTERATIONS, ADDITIONS OR IMPROVEMENTS SHALL REPLACE NONCOMPLIANT PLUMBING FIXTURES WITH WATER-CONSERVING PLUMBING FIXTURES. PLUMBING FIXTURES REPLACEMENT IS REQUIRED PRIOR TO ISSUANCE OF A CERTIFICATE OF FINAL COMPLETION, CERTIFICATE OF OCCUPANCY OR FINAL PERMIT APPROVAL BY THE LOCAL BUILDING DEPARTMENT
11. PER CGBSC 301.1.1 - WHERE ADDITION OR ALTERATION INCREASED THE BUILDING'S CONDITIONED AREA, VOLUME, OR SIZE. THE REQUIREMENTS OF CALGreen CAHPTER 4 SHALL APPLY ONLY TO AND WITHIN THE SPECIFIC AREA OF THE ADDITION OR ALTERATION.

APPLICABLE CODES

1. 2016 CALIFORNIA BUILDING CODES PART 1, 8, 10 &11
2. 2016 CALIFORNIA BUILDING CODES PART 2, 2.5, 3-5,8-9,12
3. 2016 CALIFORNIA RESIDENTIAL CODE PART 2.5
4. 2016 CALIFORNIA MECHANICAL CODE
5. 2016 CALIFORNIA PLUMBING CODE
6. 2016 CALIFORNIA ENERGY CODE
7. 2016 CALIFORNIA FIRE CODE
8. 2016 CALIFORNIA GREEN BUILDING CODES
9. ALL OTHER STATE AND LOCAL LAWS, ORDINANCES AND REGULATIONS
10. OAKLEY MUNICIPAL CODE

OAKLEY RD. DEVELOPMENT

OAKLEY - CALIFORNIA



SITE PLAN KEYNOTES:

1. (P) 2 LANES COURT
2. (P) 90 DEGREE ELBOW
3. (P) 5 FEET SIDEWALK WITH 6" CURB
4. (P) 5 FEET DEDICATED FRONT YARD PLANTING
5. (P) CROSSWALK
6. (P) LOT # & SIZE
7. (E) ROAD WAY DEDICATION
8. BIO-TREATMENT AREA
9. FIRE TRUCK ACCESS
10. HERRINGBONE PATTERN PERMEABLE PAVING @ COMMUNITY ENTRY

6' TALL FENCE
PROPERTY LINE
SETBACK LINE
SIDE WALK
FIRE ACCESS
PERMEABLE PAVING

SITE PLAN NOTES

1. ALL ELECTRIC LINES, COMMUNICATION LINES AND APPURTENANCES, INCLUDING ALL PUBLIC UTILITY, CATV AND TELEGRAPH SYSTEMS, SHALL BE LOCATED AND INSTALLED UNDERGROUND.
2. EXCAVATION CUTS EXCEEDING 5 FEET TYPICALLY REQUIRED A DOSH PERMIT. ALL EXCAVATIONS MUST CONFORM TO APPLICABLE OSHA AND CAL-OSHA REQUIREMENTS. CONTACT CALIFORNIA'S DEPARTMENT OF OCCUPATIONAL SAFETY AND HEALTH (DOSH) FOR INFORMATION ABOUT REQUIRED PERMITS. DOSH'S LOCAL OFFICE: (510) 794-2521.
3. A FIXED BENCHMARK THAT BUILDING HEIGHT CAN BE VERIFIED FROM SHOULD BE PROVIDED AT GRADE LEVEL, 38'-0".

LOT SCHEDULE

LOT 1	7075 SF	LOT 12	6191 SF
LOT 2	6062 SF	LOT 13	6208 SF
LOT 3	6060 SF	LOT 14	7277 SF
LOT 4	6043 SF	LOT 15	6306 SF
LOT 5	7068 SF	LOT 16	6306 SF
LOT 6	6656 SF	LOT 17	6000 SF
LOT 7	7065 SF	LOT 18	6000 SF
LOT 8	7065 SF	LOT 19	6000 SF
LOT 9	6652 SF	LOT 20	6000 SF
LOT 10	7135 SF	LOT 21	6293 SF
LOT 11	6120 SF	LOT 22	6293 SF

NORTH

1 Site Plan, Proposed
1" = 30'-0"

0 15' 30' 60' 120'

Cover Sheet & Site Plan, Proposed

GORDON K WONG AIA, LEED GA
710E MCGLINCY LANE SUITE 109
CAMPBELL, CA 95008
(408) 315-2125 LIC# 34045,
GKW ARCHITECTS.COM

YOON HO OH, PROJECT REP
710E MCGLINCY LANE SUITE 109
CAMPBELL, CA 95008
(408) 796-1545
GKW Architects.com

Oakley Residential Development
2480 Oakley Road
Oakley, CA

Project Schedule Revision

Cover Sheet & Site Plan, Proposed

A0.00

SCALE As indicated

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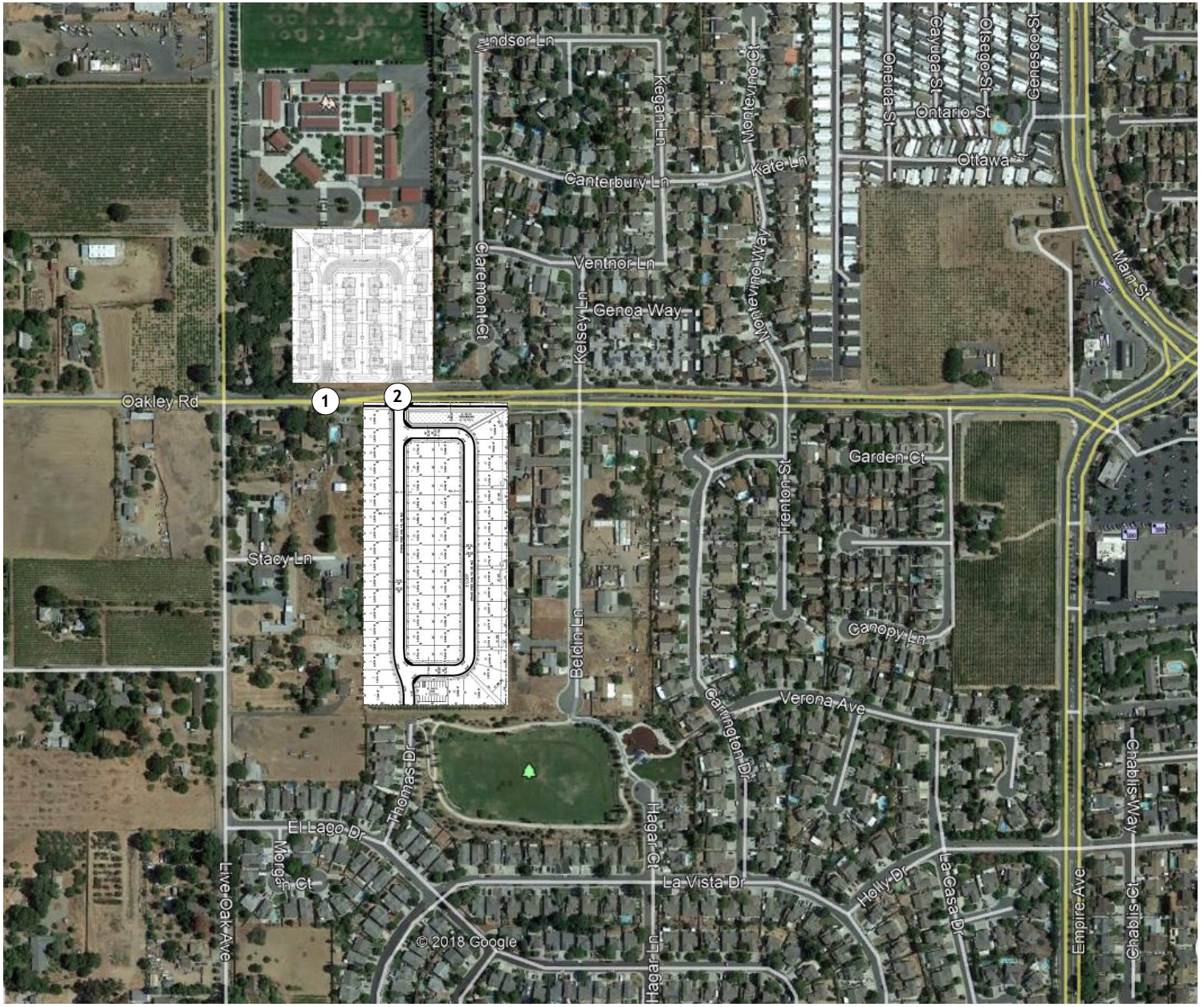
KD Anderson & Associates, Inc.
Transportation Engineers

3460-01 RA 5/1/2019

SITE PLAN

figure 2



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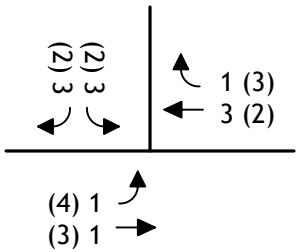
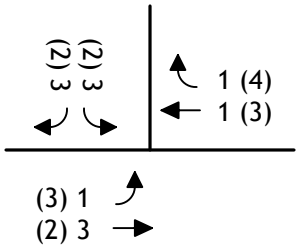


Project Access West/ Oakley Rd

2



Project Access East/ Oakley Rd

3

Legend	
XX	AM Peak Hour Volume
(XX)	PM Peak Hour Volume
R1-1	Stop Sign

NORTH

N.T.S.

PROJECT ONLY TRAFFIC VOLUMES

KD Anderson & Associates, Inc.
Transportation Engineers

3460-01 RA 5/1/2019

figure 3