

1548 MAPLE STREET PROJECT DRAFT ENVIRONMENTAL IMPACT REPORT



STATE CLEARINGHOUSE #2017072011

LSA

January 2018



CITY OF REDWOOD CITY PUBLIC NOTICE

NOTICE OF AVAILABILITY AND PUBLIC HEARING

45-Day Public Review Period
for the Draft Environmental Impact Report (EIR)

for Public Comments on the Draft EIR

Beginning on: **January 26, 2018**
Ending on: **March 12, 2018**

February 20, 2018 at 7:00 p.m.
Council Chambers, City Hall
1017 Middlefield Road, Redwood City
No decision will be made at this meeting.

Planning Commission Public Hearing

| | |
|---------------------|---|
| Project: | The project would result in the redevelopment of the 7.88 acre project site at 1548 Maple Street with 131 three story for sale market-rate townhomes with associated open space, circulation, parking, infrastructure, soil remediation and grading improvements. |
| Applicant: | Strada Investment Group |
| Lead Agency: | City of Redwood City |



How to get more information: The draft EIR and all documents referenced in the Draft EIR are available for review online at <http://www.redwoodcity.org/city-hall/current-projects/development-projects?id=63>

How to provide comments: Comments on the draft EIR must be given at the public hearing or in writing by **March 12, 2018 at 5:00 p.m.** Comments on the project generally may be given in writing at any time or at the public hearing. All written comments should be directed to the project planner:

or in person at:

- **City Hall**, 1017 Middlefield Road, Redwood City between the hours of 8:00 a.m. to 5:00 p.m., Monday to Friday.
- **Redwood City Downtown Library** at 1044 Middlefield Road, Redwood City during business hours, including weekends.

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En español: Para más información en español, favor de comunicarse con (650) 780-7234 o planning@redwoodcity.org

PROJECT DESCRIPTION

The proposed project would result in redevelopment of the project site with 131 three-story for sale, market-rate townhomes at a density of 17 units per acre, as well as associated open space, circulation and parking, infrastructure, soil remediation, and grading improvements. In addition, the proposed project would provide a 0.87-acre dedication of land for future development of the Blomquist Street roadway extension at the southern property line. As part of the proposed project, the applicant may construct a portion of the Blomquist Street Extension to connect to the reconstructed Maple Street (the proposed project) or further to Redwood Creek (the proposed project variant) concurrently with this development.

ANTICIPATED SIGNIFICANT IMPACTS

The proposed project would result in potentially significant impact related to Biological Resources; Cultural Resources; Transportation and Circulation; Air Quality; Noise; Hazards and Hazardous Materials; and Hydrology and Water Quality. However, all impacts would be reduced to a less-than-significant level through the implementation of identified mitigation measures. The project site is identified on a hazardous materials release site database compiled pursuant to Government Code Section 65962.5 and could result in a safety hazard for people residing or working in the area. Implementation of Mitigation Measures HAZ-1 and HAZ-3, and the San Francisco Bay Regional Water Quality Control Board's review of the proposed Response Plan and oversight of implementation of the Response Plan would ensure that the proposed project would result in less-than-significant impacts related to past hazardous materials releases which occurred on the project site.

**1548 MAPLE STREET PROJECT
DRAFT ENVIRONMENTAL IMPACT REPORT**

STATE CLEARINGHOUSE #2017072011

Submitted to:

City of Redwood City
Community Development Department
Planning and Housing Division
1017 Middlefield Road
Redwood City, CA 94063

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January 2018

TABLE OF CONTENTS

| | | |
|------|--|-----|
| I. | INTRODUCTION | 1 |
| A. | PURPOSE OF THIS EIR | 1 |
| B. | PROPOSED PROJECT | 1 |
| C. | EIR SCOPE | 2 |
| D. | REPORT ORGANIZATION | 3 |
| II. | SUMMARY | 5 |
| A. | PROJECT UNDER REVIEW | 5 |
| B. | POTENTIAL AREAS OF CONTROVERSY | 6 |
| C. | SUMMARY OF IMPACTS AND MITIGATION MEASURES | 6 |
| D. | SUMMARY TABLE | 8 |
| III. | PROJECT DESCRIPTION | 31 |
| A. | PROJECT SITE | 31 |
| B. | PROJECT BACKGROUND | 37 |
| C. | PROJECT OBJECTIVES | 38 |
| D. | PROPOSED PROJECT | 38 |
| E. | DISCRETIONARY ACTIONS | 53 |
| F. | PERMITS AND APPROVALS | 54 |
| IV. | SETTING, IMPACTS, AND MITIGATION MEASURES | 55 |
| A. | LAND USE AND PLANNING | 59 |
| B. | BIOLOGICAL RESOURCES | 75 |
| C. | CULTURAL RESOURCES | 101 |
| D. | TRANSPORTATION AND CIRCULATION | 117 |
| E. | AIR QUALITY | 165 |
| F. | NOISE | 197 |
| G. | HAZARDS AND HAZARDOUS MATERIALS | 219 |
| H. | HYDROLOGY AND WATER QUALITY | 237 |
| I. | UTILITIES AND SERVICE SYSTEMS | 259 |
| V. | CEQA-REQUIRED ASSESSMENT CONCLUSIONS | 271 |
| A. | GROWTH INDUCEMENT | 271 |
| B. | SIGNIFICANT IRREVERSIBLE CHANGES | 271 |
| C. | EFFECTS FOUND NOT TO BE SIGNIFICANT | 272 |
| D. | SIGNIFICANT UNAVOIDABLE IMPACTS | 275 |
| VI. | ALTERNATIVES | 277 |
| A. | NO PROJECT ALTERNATIVE | 278 |
| B. | REDUCED DEVELOPMENT ALTERNATIVE | 282 |
| C. | OTHER ALTERNATIVES CONSIDERED | 286 |
| D. | ENVIRONMENTALLY SUPERIOR ALTERNATIVE | 287 |
| VII. | REPORT PREPARATION | 289 |
| A. | REPORT PREPARERS | 289 |
| B. | REFERENCES | 290 |
| C. | COMMUNICATIONS | 295 |

APPENDICES

(Appendices C through E are included on a compact disc on the inside back cover of the EIR)

- Appendix A: Notice of Preparation and Comment Letters
- Appendix B: Initial Study
- Appendix C: Traffic Data
- Appendix D: Air Quality/Greenhouse Gas Emissions Data
- Appendix E: Noise Data

FIGURES AND TABLES

FIGURES

| | | |
|-----------------|---|-----|
| Figure III-1: | Project Location and Regional Vicinity Map | 32 |
| Figure III-2: | Aerial Photograph of Project Site and Surrounding Land Uses..... | 33 |
| Figure III-3: | Existing Site Conditions | 36 |
| Figure III-4a: | Conceptual Site Plan – Proposed Project – Partial Blomquist Street Extension to Maple Street..... | 41 |
| Figure III-4b: | Conceptual Site Plan – Proposed Project Variant – Partial Blomquist Street Extension to Redwood Creek..... | 42 |
| Figure III-5a: | Conceptual Four-Plex Building Sections and Elevations (without roof deck) | 43 |
| Figure III-5b: | Conceptual Four-Plex Building Sections and Elevations (with roof deck) | 44 |
| Figure III-6a: | Conceptual Eight-Plex Building Sections and Elevations (without roof deck) | 45 |
| Figure III-6b: | Conceptual Eight-Plex Building Sections and Elevations (with roof deck) | 46 |
| Figure III-7: | Proposed Shoreline Improvements and Building Setbacks | 47 |
| Figure III-8: | Proposed Bay Trail Improvements | 48 |
| Figure IV.A-1: | Aerial Photograph of Project Site and Existing Conditions Photo Locations..... | 61 |
| Figure IV.A-2a: | Existing Site and Surrounding Land Use Photos | 62 |
| Figure IV.A-2b: | Existing Site and Surrounding Land Use Photos | 63 |
| Figure IV.A-2c: | Existing Site and Surrounding Land Use Photos | 64 |
| Figure IV.A-2d: | Existing Site and Surrounding Land Use Photos | 65 |
| Figure IV.D-1: | Project Area and Study Intersection Locations..... | 119 |
| Figure IV.D-2: | Existing Peak Hour Traffic Volumes and Lane Configurations | 127 |
| Figure IV.D-3: | Existing Transit Facilities | 131 |
| Figure IV.D-4: | Existing and Planned Pedestrian and Bicycle Facilities | 135 |
| Figure IV.D-5: | Proposed Project Trip Distribution and Assignment | 145 |
| Figure IV.D-6: | Existing Plus Project Peak Hour Traffic Volumes and Lane Configurations | 146 |
| Figure IV.D-7: | Cumulative Peak Hour Traffic Volumes and Lane Configurations..... | 157 |
| Figure IV.D-8: | Cumulative Plus Project Peak Hour Traffic Volumes and Lane Configurations.. | 158 |

TABLES

| | | |
|----------------|--|-----|
| Table II-1: | Summary of Impacts and Mitigation Measures from the EIR | 9 |
| Table III-1: | Required Permits and Approvals | 54 |
| Table IV.A-1: | Relationship of Project to Relevant Plans and Policies | 70 |
| Table IV.B-1: | Special-Status Plant Species With CNDDDB Occurrences Within 5 Miles of the Project Site | 78 |
| Table IV.B-2: | Special-Status Animal Species With CNDDDB Occurrences Within 5 Miles of the Project Site | 83 |
| Table IV.D-1: | Signalized Intersection LOS Criteria | 122 |
| Table IV.D-2: | Unsignalized Intersection LOS Criteria | 122 |
| Table IV.D-3: | Freeway LOS Criteria | 123 |
| Table IV.D-4: | Existing Intersection Level of Service (LOS) Results | 126 |
| Table IV.D-5: | Existing Freeway Segment Level of Service (LOS) Results | 129 |
| Table IV.D-6: | Existing Freeway Ramp Level of Service (LOS) Results | 129 |
| Table IV.D-7: | Project Trip Generation | 144 |
| Table IV.D-8: | Existing Intersection Level of Service (LOS) Results | 147 |
| Table IV.D-9: | Existing Plus Project Freeway Segment Level of Service (LOS) Results | 148 |
| Table IV.D-10: | Existing Plus Project Ramp Level of Service (LOS) Results | 149 |
| Table IV.D-11: | PM Peak Hour Estimated Emergency Response Times | 151 |
| Table IV.D-12: | Project Parking Supply Comparison | 153 |
| Table IV.D-13: | Cumulative Intersection Level of Service (LOS) Results – Project/Project Variant | 159 |
| Table IV.D-14: | Cumulative Freeway Segment Level of Service (LOS) Results | 162 |
| Table IV.D-15: | Cumulative Freeway Ramp LOS Results | 163 |
| Table IV.D-16: | PM Peak Hour Estimated Emergency Response Times – Cumulative | 164 |
| Table IV.E-1: | Sources and Health Effects of Air Pollutants | 166 |
| Table IV.E-2: | San Francisco Bay Area Basin Attainment Status | 172 |
| Table IV.E-3: | Ambient Air Quality at the Redwood City Monitoring Station | 174 |
| Table IV.E-4: | Federal and State Ambient Air Quality Standards | 177 |
| Table IV.E-5: | Project Construction Emissions in Pounds Per Day | 185 |
| Table IV.E-6: | Project Operational Emissions | 187 |
| Table IV.E-7: | Maximum Long-Term Health Risk Impacts from US 101 Mobile Sources to the Project Site | 191 |
| Table IV.E-8: | Unmitigated Stationary TAC Sources Within 1,000 Feet of the Project Site | 193 |
| Table IV.E-9: | Mitigated Stationary TAC Sources Within 1,000 Feet of the Project Site | 194 |
| Table IV.E-10: | Cumulative Risk from All Sources | 195 |
| Table IV.F-1: | Definitions of Acoustical Terms | 199 |
| Table IV.F-2: | Common Sound Levels and Their Noise Sources | 200 |
| Table IV.F-3: | Summary of Human Effects in Areas Exposed to 55 dBA CNEL | 202 |
| Table IV.F-4: | Land Use Compatibility | 204 |
| Table IV.F-7: | Existing Traffic Noise Levels Without Project | 205 |
| Table IV.F-8: | Vibration Source Amplitudes for Construction Equipment | 211 |
| Table IV.F-9: | Existing Traffic Noise Levels Without and With the Proposed Project and the Project Variant | 213 |
| Table IV.F-10: | Noise Emission Reference Levels and Usage Factors | 216 |
| Table IV.I-1: | Annual Project Water Demand | 267 |

I. INTRODUCTION

A. PURPOSE OF THIS EIR

In compliance with the California Environmental Quality Act (CEQA), this Environmental Impact Report (EIR) describes the potential environmental impacts of the 1548 Maple Street Project (project). The purpose of this EIR is to inform Redwood City decision-makers, responsible agencies, and the general public of the proposed project and the potential environmental impacts of project approval and implementation. This EIR also examines alternatives to the proposed project and recommends mitigation measures to reduce or avoid potentially significant physical impacts.

The City of Redwood City (City) is the CEQA Lead Agency for environmental review. This EIR will be used by the Planning Commission, City Council, responsible agencies, and the public in their review of the proposed project and associated approvals described below and in more detail in Chapter III, Project Description.

B. PROPOSED PROJECT

The approximately 7.88-acre project site is located at 1548 Maple Street within the Redwood Creek/Harbor Center area of the City of Redwood City, San Mateo County. The project site is located adjacent to Redwood Creek, which flows into San Francisco Bay. The irregularly-shaped project site is bounded by the existing Docktown Marina and Redwood Creek to the north, Maple Street to the east, institutional uses to the south, and US Highway 101 (US 101) to the west and south.

The proposed project would result in redevelopment of the project site with 131 three-story for sale, market-rate townhomes at a density of 17 units per acre, as well as associated open space, circulation and parking, infrastructure, soil remediation, and grading improvements. The existing water tank on the site, which is considered a locally-important historic resource for the purposes of CEQA, would be retained and relocated to an off-site City-owned location.

The townhome units would be organized within 21 separate buildings. Each building would include between four and eight residential units with two stories of living area over a ground floor parking garage. Each unit would include between two- and three-bedrooms. Buildings would be a maximum of 41 feet in height to the top of the roofline. Each townhome unit would include two-vehicle parking garage at the ground level, for a total of 262 off-street parking spaces. A total of 35 on-street guest parking spaces would be provided throughout the development and 45 on-street public parking spaces would be provided in dedicated parking spaces on the improved Maple Street. A variety of private and public open space opportunities would be developed throughout the site, including a 30-foot minimum shoreline greenway that would contain a 12-foot-wide segment of the Bay Trail.

In addition, the proposed project would provide a 0.87-acre dedication of land for future development of the Blomquist Street Extension at the southern property line. The City would also vacate a portion of Maple Street to be included into the project area, and the project would result in the reconstruction

of Maple Street to provide for adequate access. As part of the proposed project, the applicant would construct a portion of the Blomquist Street Extension to connect to the reconstructed Maple Street and may construct a second segment of the extension further to Redwood Creek concurrently with this development and within the 0.87-acre area to be dedicated to the City. Both of these potential off-site improvements are considered in this EIR and are referred to throughout this EIR as follows: 1) Partial Blomquist Street Extension to Maple Street (i.e., the “proposed project”); and 2) Partial Blomquist Street Extension to Redwood Creek (i.e., the “proposed project variant”).

C. EIR SCOPE

The City circulated a Notice of Preparation (NOP) for the project on July 6, 2017 to help identify the types of impacts that could result from the proposed project, as well as potential areas of controversy. The NOP was mailed to public agencies, organizations, and individuals likely to be interested in the potential impacts of the project. A scoping session for the Draft EIR was held as a public meeting before the Planning Commission on July 18, 2017. Comments on the NOP were received by the City and considered during preparation of the EIR. Six comment letters regarding the NOP were received, in addition to the verbal comments provided at the public scoping session. Copies of the NOP and the comment letters are included in Appendix A.

The following environmental topics are addressed in this EIR:

- A. Land Use and Planning
- B. Biological Resources
- C. Cultural Resources
- D. Traffic and Circulation
- E. Air Quality
- F. Noise
- G. Hazards and Hazardous Materials
- H. Hydrology and Water Quality
- I. Utilities and Service Systems

It has been determined that the following potential effects of the proposed project would be less than significant or have no impact, and therefore these topics are not studied in detail in the Draft EIR: aesthetics; agricultural and forestry resources; geology and soils; greenhouse gas emissions; mineral resources; population and housing; public services; recreation; and tribal cultural resources. Each of these topic areas is addressed in the Initial Study provided in Appendix B and summarized in Chapter V, CEQA-Required Assessment Conclusions of this EIR.

D. REPORT ORGANIZATION

This EIR is organized into the following chapters:

- *Chapter I - Introduction*: Discusses the overall EIR purpose, provides a summary of the proposed project and the project variant, describes the EIR scope, and summarizes the organization of the EIR.
- *Chapter II - Summary*: Provides a summary of the impacts that would result from implementation of the proposed project and the project variant, describes mitigation measures recommended to reduce or avoid significant impacts, and describes the alternatives to the proposed project.
- *Chapter III - Project Description*: Provides a description of the project site, the project objectives, the proposed project and the project variant, and uses of this EIR.
- *Chapter IV - Setting, Impacts and Mitigation Measures*: Describes the following for each environmental technical topic: existing conditions (setting), potential environmental impacts and their level of significance, and mitigation measures recommended to reduce or avoid identified impacts. Impacts identified for the proposed project and the project variant are identified separately, where applicable. Potential adverse impacts are identified by levels of significance, as follows: less-than-significant impact (LTS), significant impact (S), and significant and unavoidable impact (SU). The significance of each impact is categorized before and after implementation of any recommended mitigation measures(s). Cumulative impacts are also addressed.
- *Chapter V - CEQA-Required Assessment Conclusions*: Provides an analysis of effects found not to be significant, growth-inducing impacts, unavoidable significant environmental impacts, and significant irreversible changes.
- *Chapter VI - Alternatives*: Provides an evaluation of one alternative to the proposed project in addition to the CEQA-required No Project alternative.
- *Chapter VII - Report Preparation*: Identifies preparers of the EIR, references used, and the persons and organizations contacted.
- *Appendices*: The appendices contain the NOP and comment letters on the NOP (Appendix A), the Initial Study (Appendix B), technical calculations, and other documentation prepared in conjunction with this EIR.

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II. SUMMARY

This chapter provides an overview of the proposed project and the findings outlined in this EIR, including a discussion of alternatives and cumulative project impacts.

A. PROJECT UNDER REVIEW

This EIR has been prepared to evaluate the environmental consequences of approval and implementation of the 1548 Maple Street Project (project). The approximately 7.88-acre project site is located at 1548 Maple Street within the Redwood Creek/Harbor Center area of the City of Redwood City, San Mateo County. The project site is located adjacent to Redwood Creek, which flows into San Francisco Bay. The irregularly-shaped project site is bounded by the existing Docktown Marina and Redwood Creek to the north, Maple Street to the east, institutional uses to the south, and US Highway 101 (US 101) to the west and south.

The proposed project would result in redevelopment of the project site with 131 three-story for sale, market-rate townhomes at a density of 17 units per acre, as well as associated open space, circulation and parking, infrastructure, soil remediation, and grading improvements. The existing water tank on the site, which is considered a locally-important historic resource for the purposes of CEQA, would be retained and relocated to an off-site City-owned location.

The townhome units would be organized within 21 separate buildings. Each building would include between four and eight residential units with two stories of living area over a ground floor parking garage. Each unit would include between two- and three-bedrooms. Buildings would be a maximum of 41 feet in height to the top of the roofline. Each townhome unit would include two-vehicle parking garage at the ground level, for a total of 262 off-street parking spaces. A total of 35 on-street guest parking spaces would be provided throughout the development and 45 on-street public parking spaces would be provided in dedicated parking spaces on the improved Maple Street. A variety of private and public open space opportunities would be developed throughout the site, including a 30-foot minimum shoreline greenway that would contain a 12-foot-wide segment of the Bay Trail.

In addition, the proposed project would provide a 0.87-acre dedication of land for future development of the Blomquist Street Extension at the southern property line. The City would also vacate a portion of Maple Street to be included into the project area, and the project would result in the reconstruction of Maple Street to provide for adequate access. As part of the proposed project, the applicant would construct a portion of the Blomquist Street Extension to connect to the reconstructed Maple Street and may construct a second segment of the extension further to Redwood Creek concurrently with this development and within the 0.87-acre area to be dedicated to the City. Both of these potential off-site improvements are considered in this EIR and are referred to throughout this EIR as follows: 1) Partial Blomquist Street Extension to Maple Street (i.e., the “proposed project”) and 2) Partial Blomquist Street Extension to Redwood Creek (i.e., the “proposed project variant”).

Discretionary actions/approvals by the City that would be necessary for this project include: 1) Development Agreement; 2) Zoning Map and Text Amendment; 3) Vesting Tentative Map; 4) Use Permit; and 5) Sign Permit. The California Regional Water Quality Control Board would also be responsible for approval of a Response Plan under the California Land Reuse and Revitalization Act.

B. POTENTIAL AREAS OF CONTROVERSY

A total of three comment letters were received in response to the Notice of Preparation (NOP), in addition to the verbal comments received at the public scoping session held on July 18, 2017. The NOP, comment letters received, and meeting summary from the scoping session are included in Appendix A. Comments in response to the NOP generally identified the following areas of potential concern:

- Proximity of the site to waterways, including impacts related to water quality, flooding, and sea level rise;
- Impacts to wetlands;
- Provision of affordable housing;
- Number of parking spaces;
- Impacts to historic resources;
- Impacts to schools; and
- Impacts to nearby open space areas.

Commenters also suggested a few alternatives that should be considered in the EIR. The City considered the comments received on the NOP and at the public scoping session during preparation of the Initial Study and EIR.

C. SUMMARY OF IMPACTS AND MITIGATION MEASURES

This summary provides an overview of the analysis contained in the Initial Study (included in Appendix B) and Chapter IV, Setting, Impacts, and Mitigation Measures of this EIR.

1. Findings of the Initial Study

The Initial Study for the proposed project is included in Appendix B to this EIR. The Initial Study identified either no impact or less than significant impacts related to the following environmental issues:

- Aesthetics
- Agriculture and Forestry Resources
- Geology and Soils
- Greenhouse Gas Emissions
- Mineral Resources

- Population and Housing
- Public Services
- Recreation
- Tribal Cultural Resources

The Initial Study identified potential impacts requiring more detailed evaluation related to the following environmental issues, which are further evaluated in this EIR:

- Air Quality
- Biological Resources
- Cultural Resources
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Noise
- Transportation and Circulation
- Utilities and Service Systems

For a complete description of potential impacts and recommended mitigation measures identified in the Initial Study, please refer to the specific discussion in the Initial Study, included as Appendix B to this EIR. Chapter V, CEQA-Required Assessment Conclusions, also included a summary of the findings for each topic not discussed in the EIR.

2. Significant Impacts

Under CEQA, a significant impact on the environment is defined as "...a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance." Impacts in the following areas would be significant without the implementation of mitigation measures, but would be reduced to a less-than-significant level if the mitigation measures recommended in this report are implemented:

- Biological Resources
- Cultural Resources
- Transportation and Circulation
- Air Quality
- Noise
- Hazardous Materials
- Hydrology and Water Quality

3. Significant and Unavoidable and Cumulative Impacts

No significant and unavoidable or cumulative impacts were identified in the Initial Study or the EIR.

4. Alternatives to the Project

In accordance with CEQA and the CEQA Guidelines (Section 15126.6), an EIR must describe a reasonable range of alternatives to the project, or to the location of the project, that could attain most of the project's basic objectives, while avoiding or substantially lessening any of the significantly adverse environmental effects of the project. The range of alternatives required in an EIR is governed by a "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice. CEQA states that an EIR should not consider alternatives "whose effect cannot be ascertained and whose implementation is remote and speculative."

The two alternatives to the proposed project that are discussed and analyzed in Chapter VI of this EIR are:

- The **No Project alternative**, which assumes the continuation of existing conditions within the project site. No new residential uses would be constructed, no existing buildings would be demolished, and no improvements would be made to existing infrastructure.
- The **Reduced Development alternative**, which assumes redevelopment of the site with a 92-unit residential townhome community, with similar open space, circulation and parking, infrastructure, soil remediation, and grading improvements as proposed by the project.

Each alternative is compared to the proposed project, and discussed in terms of its various mitigating or adverse effects on the environment. Analysis of the alternatives focuses on those topics for which significant adverse impacts would result from the proposed project. The Reduced Development alternative is considered to be the environmentally superior alternative.

D. SUMMARY TABLE

Information in Table II-1, Summary of Impacts and Mitigation Measures, has been organized to correspond with environmental issues discussed in Chapter IV. The table is arranged in four columns: (1) impacts; (2) level of significance prior to mitigation; (3) mitigation measures; and (4) level of significance after mitigation. Levels of significance are categorized as follows:

| | |
|-----|-----------------------------|
| SU | Significant and Unavoidable |
| S | Significant |
| LTS | Less Than Significant |

For a complete description of potential impacts and recommended mitigation measures, please refer to the specific topical discussions in Chapter IV.

Table II-1: Summary of Impacts and Mitigation Measures

| Environmental Impacts | Level of Significance Without Mitigation | Mitigation Measures | Level of Significance With Mitigation |
|---|--|---|---------------------------------------|
| A. LAND USE AND PLANNING | | | |
| <i>There are no impacts to land use and planning.</i> | | | |
| B. BIOLOGICAL RESOURCES | | | |
| <u>BIO-1</u> : Construction of the proposed project and the project variant could result in impacts to nesting white-tailed kites and other native birds protected under the federal Migratory Bird Treaty Act and California Fish and Game Code. | S | <u>BIO-1</u> : To the extent feasible, initial grading and vegetation removal activities shall occur during the non-nesting season (September 1 to January 31). For any construction activities conducted during the nesting season, a qualified biologist (i.e., experienced in searching for passerine nests) shall conduct a preconstruction nest survey of all trees or other suitable nesting habitat in and within 250 feet of the limits of construction activities. The survey shall be conducted no more than two days prior to the start of work. If the survey indicates the presence of nesting birds, the biologist shall determine an appropriately sized buffer around the nest in which no work shall occur until the young have successfully fledged. The size of the nest buffer shall be determined by the biologist and shall be based on the nesting species and its sensitivity to disturbance. In general, buffer sizes of up to 250 feet for raptors and 50 feet for other birds should suffice to prevent substantial disturbance to nesting birds, but these buffers may be increased or decreased, as appropriate, depending on the bird species and the level of disturbance anticipated near the nest. | LTS |
| <u>BIO-2</u> : Construction of the proposed project and the project variant could result in impacts to longfin smelt, a special-status species, and other native fish species. | S | <u>BIO-2a</u> : If in-water work is required in Redwood Creek the work shall be restricted to the period between August 1 and November 30 when longfin smelt are unlikely to be present. <u>BIO-2b</u> : For any dewatering that could occur during the construction period, all discharge water shall be pumped into a temporary siltation pond/desilting basin, Baker tank, or similar detention device for settling of sediments prior to their release downstream in accordance with the approved Stormwater Pollution Prevention Plan. <u>BIO-2c</u> : Excavated material shall not be placed on aquatic vegetation, or allowed to fall or be transported into Redwood Creek. <u>BIO-2d</u> : Silt-trapping devices shall be used to minimize downstream sedimentation. | LTS |

Table II-1: Summary of Impacts and Mitigation Measures

| Environmental Impacts | Level of Significance Without Mitigation | Mitigation Measures | Level of Significance With Mitigation |
|--|--|---|---------------------------------------|
| BIO-2 <i>Continued</i> | | BIO-2e: Rock riprap in low-flow channels shall only be used where riprap is determined to be the only feasible stabilization approach. Individual bank stabilization activities using rock riprap shall not exceed 500 feet in length along the bank, and the amount of riprap used shall not exceed 1 cubic yard per running foot placed along the bank below the ordinary high water mark without specific authorization from the applicable resource agency. | |
| BIO-3: Construction activities associated with the proposed project and the project variant could interfere with the movement or habitat quality of white-tailed kite and longfin smelt. | S | <p>BIO-3a: Prior to the initiation of construction activities (including demolition, and staging) all personnel associated with project construction shall attend an Environmental Awareness Training. The training should be conducted by a qualified biologist, to aid workers in recognizing special-status resources that may occur in the project area. The specifics of this program should include identification of the special-status species and habitats, a description of the regulatory status, and review of the measures required to reduce impacts to biological resources on the project site. Each worker shall be given a handout with key points. At the end of the training, all workers should sign to document their participation in the program and understanding of the measures.</p> <p>BIO-3b: No pets or firearms shall be allowed at the project site, with the exception of authorized law enforcement personnel.</p> <p>BIO-3c: All food-related trash that may attract predators and vermin shall be properly contained and removed from the work site daily.</p> <p>BIO-3d: All refueling, maintenance, and staging of equipment and vehicles shall occur at least 100 feet from the top of bank of Redwood Creek. Secondary containment shall be used during refueling. A spill prevention plan shall be in place prior to the initiation of demolition or construction activities.</p> <p>BIO-3e: All vehicles and equipment shall be maintained in good working condition and free of leaks.</p> | LTS |

Table II-1: Summary of Impacts and Mitigation Measures

| Environmental Impacts | Level of Significance Without Mitigation | Mitigation Measures | Level of Significance With Mitigation |
|---|--|--|---------------------------------------|
| <p>BIO-3 <i>Continued</i></p> | | <p><u>BIO-3f</u>: Standard Best Management Practices (BMPs) shall be employed to avoid degradation of aquatic habitat by maintaining water quality and controlling erosion and sedimentation during construction as required by compliance with the General National Pollution Discharge Elimination System Permit for Construction Activities.</p> <p>BMPs shall include, but not be limited to, installation of silt fencing and erosion control wattles between Redwood Creek and construction activities.</p> <p><u>BIO-3g</u>: To prevent the entanglement of wildlife, no erosion control devices containing plastic monofilament netting shall be used or stored on site.</p> | |
| <p><u>BIO-4</u>: Construction of the proposed project and the project variant could have a substantial adverse effect on federally protected seasonal wetlands and freshwater emergent wetlands as defined by Section 404 of the Clean Water Act, as well as waters of the State as defined through the Porter-Cologne Water Quality Control Act. Up to 0.056 acres could be affected by the proposed project and an additional 0.137 acres could be affected by the project variant.</p> | <p>S</p> | <p><u>BIO-4a</u>: The project applicant shall file a Report of Waste Discharge with the Regional Water Board and comply with all project-specific Waste Discharge Requirements issued by the Regional Water Board during the Report of Waste Discharge approval process.</p> <p><u>BIO-4b</u>: All waters of the U.S and waters of the State filled by the project shall be mitigated as required by applicable agency permits that shall be obtained prior to the initiation of construction. Mitigation may be accomplished by: (1) off-site creation of new seasonal wetlands at an appropriate mitigation site; or (2) purchase of credits at an approved off-site mitigation bank.</p> <p>If the mitigation is to be accomplished by creating new wetlands at an off-site location owned or otherwise controlled by the applicant, the applicant shall prepare and implement a wetland mitigation and monitoring plan (MMP) detailing the mitigation design, wetland planting design, maintenance and monitoring requirements, reporting requirements, and success criteria. Mitigation wetlands shall be monitored for a minimum of five years to verify that the success criteria have been achieved. The applicant shall also provide financial assurances for the operation and monitoring of the created wetlands.</p> | <p>LTS</p> |

Table II-1: Summary of Impacts and Mitigation Measures

| Environmental Impacts | Level of Significance Without Mitigation | Mitigation Measures | Level of Significance With Mitigation |
|--|--|---|---------------------------------------|
| BIO-4 <i>Continued</i> | | <p>The MMP shall be approved by the Regional Water Board and the City prior to approval of the Final Map.</p> <p>The purchase of mitigation credits from the mitigation bank would accomplish the goal of the California Wetlands Conservation Policy (“No Net Loss Policy;” Executive Order W-59-93) to “ensure no overall net loss and achieve a long-term net gain in the quantity, quality, and permanence of wetlands acreage and values in California.” A credit purchase agreement or receipt shall be provided prior to approval of the grading plan.</p> | |
| C. CULTURAL RESOURCES | | | |
| <p><u>CUL-1</u>: Removal and relocation of the Water Tank would have a substantial adverse change on an eligible City landmark that qualifies as a historical resource, as defined in CEQA Guidelines Section 15064.5.</p> | S | <p><u>CUL-1</u>: The project applicant shall be responsible for funding all of the measures outlined below regarding relocation of the Water Tank. These measures shall be completed prior to, during, and after relocation of the Water Tank, as applicable.</p> <p>The following tasks shall be undertaken prior to the Water Tank's relocation:</p> <ul style="list-style-type: none"> • Photo documentation of the Water Tank shall be completed prior to its removal from the project site. The photography shall be done to Historic American Building Survey-like standards. The photo documentation shall be filed with the Redwood City Public Library History Room/Vollmayer Archives. | LTS |

Table II-1: Summary of Impacts and Mitigation Measures

| Environmental Impacts | Level of Significance Without Mitigation | Mitigation Measures | Level of Significance With Mitigation |
|------------------------|--|---|---------------------------------------|
| CUL-1 <i>Continued</i> | | <ul style="list-style-type: none"> • A qualified preservation architect and structural engineer/ contractor shall prepare a Relocation Plan that:(1) describes the specific approach to dismantling the metal tank from the wood base, and any other portions of the tank; (2) describes how the receiver location will be prepared to accept the tank, including but not limited to grading and construction of the foundation; proposed travel route from the existing location to the new location; (3) delineates the historic features of the tank, specifying features that cannot be repaired, are deteriorated or damaged beyond repair; and (4) describes a permanent commemorative photographic display to be incorporated in the relocated Water Tank. • The Relocation Plan and documentation shall be submitted for review and shall be approved by the City of Redwood City Planning Division prior to the removal of the Water Tank. <p>The following tasks shall be undertaken during and after the Water Tank's relocation:</p> <ul style="list-style-type: none"> • The relocation shall be implemented in accordance with the approved Relocation Plan and all required City noticing and permitting requirements. • The Water Tank shall be reconstructed near the shoreline, consistent with the original historic setting of the structure. • The Water Tank shall be properly placed and secured on permanent footings or foundation. • Reconstruction or repair of the Water Tank shall not materially impair or visually obscure the historic features of the structure. • A qualified preservation architect and structural engineer/contractor shall oversee reconstruction of the Water Tank at its new location to ensure that the work is done in accordance with the Relocation Plan. | |

Table II-1: Summary of Impacts and Mitigation Measures

| Environmental Impacts | Level of Significance Without Mitigation | Mitigation Measures | Level of Significance With Mitigation |
|--|---|---|--|
| <p><u>CUL-2</u>: Ground-disturbing activities occurring with development of both the proposed project and the project variant could have a substantial adverse change on archaeological deposits that qualify as historical resources, as defined in CEQA Guidelines Section 15064.5, and could materially impair historic-period archaeological deposits.</p> | <p>S</p> | <p><u>CUL-2a</u>: Prior to project ground disturbance, all construction contractor(s) responsible for overseeing and operating ground-disturbing mechanical equipment (e.g., on-site construction managers and backhoe operators) shall be alerted to the sensitivity of the project site for buried archaeological deposits. A qualified archaeologist that meets the Secretary of the Interior’s Professional Qualifications Standards for Historic Archeology shall conduct a “tailgate presentation” to alert relevant construction personnel of the appropriate procedures that should be undertaken if archaeological deposits are encountered during construction.</p> <p><u>CUL-2b</u>: All ground disturbance activities at the project site shall be monitored by an archaeologist that meets the Secretary of the Interior’s Professional Qualifications Standards for Historic Archaeology. Monitoring shall continue at this location until the archaeologist determines that there is a low potential for subsurface archaeological deposits.</p> <p>Should an archaeological deposit be encountered during project subsurface construction, all ground-disturbing activities within 25 feet shall be redirected and the on-site archaeologist shall assess the deposit, consult with agencies as appropriate, and make recommendations for the treatment of the discovery. The City shall be notified by the construction contractor within 24 hours of the encounter.</p> | <p>LTS</p> |

Table II-1: Summary of Impacts and Mitigation Measures

| Environmental Impacts | Level of Significance Without Mitigation | Mitigation Measures | Level of Significance With Mitigation |
|-------------------------------|--|--|---------------------------------------|
| <p>CUL-2 <i>Continued</i></p> | | <p>If found to be significant by the on-site archaeologist (i.e., eligible for listing in the California Register of Historical Resources), the archaeologist shall prepare a Treatment Plan that describes the measures proposed for reducing impacts to the archaeological deposit. The City of Redwood City Planning and Housing Division shall review the Treatment Plan for adequacy prior to its implementation. Mitigation measures proposed in the Treatment Plan may include, but would not be limited to, recording the archaeological deposit, data recovery and laboratory analysis of recovered archaeological materials, and public outreach. No project ground disturbance shall occur within at least 25 feet of an archaeological historical resource until a qualified archaeologist records and removes the deposit, consistent with the provisions of the Treatment Plan. The applicant shall be responsible for funding implementation of appropriate mitigation measures, and the City shall be responsible for monitoring implementation of the mitigation measures.</p> <p>Upon completion of the selected mitigations, a report documenting the methods and findings shall be prepared and submitted to the City for review, which shall ensure that the provisions of the Treatment Plan have been met. The final report shall be submitted to the Northwest Information Center at Sonoma State University. Significant archaeological materials shall be submitted to an appropriate local curation facility and used for future research and public interpretive displays, as appropriate.</p> | |

Table II-1: Summary of Impacts and Mitigation Measures

| Environmental Impacts | Level of Significance Without Mitigation | Mitigation Measures | Level of Significance With Mitigation |
|--|--|---|---------------------------------------|
| CUL-2 <i>Continued</i> | | CUL-2c: Should an archaeological deposit be encountered during project subsurface construction activities when an archaeological monitor is not on site, all ground-disturbing activities within 25 feet shall be redirected and a qualified archaeologist meeting the Secretary of the Interior’s Professional Qualifications Standards for Historic Archeology contacted to assess the situation, determine if the deposit qualifies as a historical resource, consult with agencies as appropriate, and make recommendations for the treatment of the discovery. If the deposit is found to be significant (i.e., eligible for listing in the California Register of Historical Resources), the applicant shall be responsible for funding and implementing appropriate mitigation measures. Mitigation measures may include recordation of the archaeological deposit, data recovery and analysis, and public outreach regarding the scientific and cultural importance of the discovery. Upon completion of the selected mitigations, a report documenting methods, findings, and recommendations shall be prepared and submitted to the City for review, and the final report shall be submitted to the Northwest Information Center at Sonoma State University. Significant archaeological materials shall be submitted to an appropriate local curation facility and used for future research and public interpretive displays, as appropriate. | |
| D. TRANSPORTATION AND CIRCULATION | | | |
| TRA-1: Development of the proposed project and the project variant would add traffic to Broadway/Woodside Road (SR 84)/US 101 Southbound Off-Ramp (Intersection #6), which currently operates at LOS F in the AM peak hour under Existing conditions, and would increase vehicle delay at this intersection by more than the five-seconds. | S | TRA-1: The project applicant shall pay to retime and optimize the traffic signals at Broadway/Woodside Road (SR 84)/US 101 Southbound Off-Ramp. Since Caltrans controls this intersection, the project applicant would need to coordinate with the City and Caltrans to implement the mitigation measure. | LTS |

Table II-1: Summary of Impacts and Mitigation Measures

| Environmental Impacts | Level of Significance Without Mitigation | Mitigation Measures | Level of Significance With Mitigation |
|--|---|--|--|
| <p><u>TRA-2</u>: Construction associated with development of the proposed project and the project variant would increase traffic volumes at area intersections and on area freeways, potentially causing temporary increased congestion and/or disruption of vehicle, pedestrian, bicycle and transit circulation.</p> | <p>S</p> | <p><u>TRA-2</u>: The project applicant shall develop and submit to the City for approval a construction management plans that specify measures that would reduce impacts to motor vehicle, bicycle, pedestrian, and transit circulation. The City must approve the plans prior to the issuing of a building permit. Construction management plans shall include the following:</p> <ul style="list-style-type: none"> • Location of construction staging areas for materials, equipment, and vehicles; • Notification procedures for adjacent property owners and public safety personnel regarding when major deliveries, detours, and lane closures will occur; • Identification of haul routes for movement of construction vehicles that would minimize impacts on vehicular, bicycle, and pedestrian traffic, circulation, and safety; and provision for monitoring surface streets used for haul routes so that any damage and debris attributable to the haul trucks can be identified and corrected by the project applicant; • Provisions for removal of trash generated by project construction activity; • A process for responding to, and tracking, complaints pertaining to construction activity, including identification of an on-site complaint manager; and • Provisions for pedestrian, bicycle, and transit circulation through the congestion zone, including maintaining pedestrian and bicycle access between the bridge over Redwood Creek and Blomquist Street sidewalks and bike lanes. | <p>LTS</p> |

Table II-1: Summary of Impacts and Mitigation Measures

| Environmental Impacts | Level of Significance Without Mitigation | Mitigation Measures | Level of Significance With Mitigation |
|--|---|---|--|
| <p><u>TRA-3:</u> Development of the proposed project and the project variant, combined with cumulative development in the defined geographic area, including past, present, existing, approved, pending, and reasonably foreseeable future development, would contribute a considerable amount of traffic and increase the average vehicle delay by more than the five seconds at Broadway/Woodside Road/US 101 Southbound Off-Ramp (Intersection #6) during the AM peak hour.</p> | <p>S</p> | <p><u>TRA-3:</u> Additional capacity along the Woodside Road corridor shall be added and improvements to the US 101/SR 84 interchange shall be made pursuant to the US 101/SR 84 Interchange Improvement Project. The project applicant shall contribute its fair share contribution to the improvements. Concurrent with future building permit applications, the City shall ensure that the required fair-share payment has been submitted.</p> | <p>LTS</p> |
| <p><u>TRA-4:</u> Development of the proposed project and the project variant, combined with cumulative development in the defined geographic area, including past, present, existing, approved, pending, and reasonably foreseeable future development, would contribute a considerable amount of traffic to Blomquist Street/Seaport Boulevard/East Bayshore Road (Intersection #8) and increase the delay by more than the five seconds in the PM peak hour.</p> | <p>S</p> | <p><u>TRA-4:</u> The existing right-of-way shall be restriped to add a second westbound left turn pocket on East Bayshore Road and to extend the existing turn pockets. This modification is included in the TIF project list. The project applicant shall contribute its fair share to this improvement. Concurrent with future building permit applications, the City shall ensure that the required transportation impact mitigation fee has been submitted.</p> | <p>LTS</p> |

Table II-1: Summary of Impacts and Mitigation Measures

| Environmental Impacts | Level of Significance Without Mitigation | Mitigation Measures | Level of Significance With Mitigation |
|--|--|--|---------------------------------------|
| E. AIR QUALITY | | | |
| <p><u>AIR-1</u>: Construction of the proposed project and the project variant would generate air pollutant emissions that could violate air quality standards.</p> | S | <p><u>AIR-1</u>: Consistent with guidance from the BAAQMD, the project contractor shall ensure the following Basic Construction Mitigation Measures are implemented through all construction contracts and specifications for the project:</p> <ul style="list-style-type: none"> • All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day. • All haul trucks transporting soil, sand, or other loose material off-site shall be covered. • All visible mud or dirt tracked-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. • All vehicle speeds on unpaved roads shall be limited to 15 mph. • 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. • 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. • All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation. • A publicly visible sign shall be posted with the telephone number and person to contact at the City of Redwood City regarding dust complaints. This person shall respond and take corrective action within 48 hours. The BAAQMD phone number shall also be visible to ensure compliance with applicable regulations. | LTS |

Table II-1: Summary of Impacts and Mitigation Measures

| Environmental Impacts | Level of Significance Without Mitigation | Mitigation Measures | Level of Significance With Mitigation |
|---|--|---|---------------------------------------|
| <p><u>AIR-2:</u> Operation of the proposed project would expose future residents of the project site to toxic air contaminants.</p> | <p>S</p> | <p><u>AIR-2:</u> The following measures shall be implemented by the project applicant and approved by the City through the final design process to reduce TACs and particulate matter indoors to a level sufficient to achieve compliance with BAAQMD health risk thresholds:</p> <ul style="list-style-type: none"> • The project applicant shall provide an HVAC system with a control efficiency sufficient to result in a reduction of a minimum 80.0 percent of particulates of 2.5 microns or less, such as Minimum Efficiency Reporting Value (MERV)-13 filters or greater, for indoor air filtration systems . The ventilation system shall be certified to achieve the stated performance effectiveness from indoor areas. • The project applicant shall locate all air intakes as far away from US 101 as feasible. • The project applicant shall disclose to potential occupants of the project that the proximity of the project site to the freeway could result in increased long-term health risks. The disclosure shall indicate the specifications for the installed air filtration system. | <p>LTS</p> |
| <p>F. NOISE</p> | | | |
| <p><u>NOI-1:</u> The proposed project and the project variant would locate residential land uses in an area that, based on the City’s Noise and Land Use Compatibility Guidelines, is generally considered an unacceptable noise environment for residential land uses.</p> | <p>S</p> | <p><u>NOI-1:</u> The project design shall implement the following measures to the satisfaction of the City in order to reduce interior noise impacts in compliance with City noise standards:</p> <ul style="list-style-type: none"> • In order for windows and doors to remain closed, mechanical ventilation such as air conditioning shall be provided for all units. • All windows and glass doors shall be rated STC 33 or higher such that the noise reduction provided will satisfy the interior noise standard of 45 dBA CNEL. • All exterior walls shall be constructed with a minimum STC rating of STC-46. • All vent ducts connecting interior spaces to the exterior (i.e., bathroom exhaust, etc.) shall have at least two 90 degree turns in the duct. | <p>LTS</p> |

Table II-1: Summary of Impacts and Mitigation Measures

| Environmental Impacts | Level of Significance Without Mitigation | Mitigation Measures | Level of Significance With Mitigation |
|---|--|---|---------------------------------------|
| NOI-1 <i>Continued</i> | | <ul style="list-style-type: none"> All windows and doors shall be installed in an acoustically-effective manner. Sliding-window panels shall form an air-tight seal when in the closed position and the window frames shall be caulked to the wall opening around the perimeter with a non-hardening caulking compound to prevent sound infiltration. Exterior doors shall seal air-tight around the full perimeter when in the closed position. | |
| <p><u>NOI-2</u>: Noise from construction activities would result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.</p> | S | <p><u>NOI-2</u>: The project contractor shall implement the following measures during construction of the proposed project:</p> <ul style="list-style-type: none"> Equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers consistent with manufacturers' standards. Place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the active project site. Locate equipment staging in areas that would create the greatest possible distance between construction-related noise sources and noise-sensitive receptors nearest the active project site during all project construction. Ensure that all general construction related activities are restricted to between the hours of 7:00 a.m. and 8:00 p.m. on weekdays. No construction shall be permitted on weekends or holidays. Post a sign at all entrances to the work site prior to commencement of the work for the purpose of informing all contractors and subcontractors and all other persons at the property of the basic limitations upon noise and construction activities provided in the noise ordinance. Designate a "disturbance coordinator" at the City of Redwood City who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaint (e.g., starting too early, bad muffler) and would determine and implement reasonable measures warranted to correct the problem. | LTS |

Table II-1: Summary of Impacts and Mitigation Measures

| Environmental Impacts | Level of Significance Without Mitigation | Mitigation Measures | Level of Significance With Mitigation |
|---|--|--|---------------------------------------|
| G. HAZARDS AND HAZARDOUS MATERIALS | | | |
| <p><u>HAZ-1</u>: Construction of the proposed project and the project variant could result in accidental releases of hazardous materials and/or the disturbance and reuse of soil potentially impacted with hazardous materials that could result in impacts to construction workers, the public, and/or the environment.</p> | S | <p><u>HAZ-1</u>: A Construction Risk Management Plan (CRMP) shall be prepared by a qualified environmental professional to protect construction workers, the public, and the environment from hazardous materials, including potential unknown contamination in the subsurface of the project site. The CRMP shall be submitted to and approved by the Regional Water Board prior to the start of construction activities, and shall include, but not be limited to, the following:</p> <ol style="list-style-type: none"> 1. Procedures for evaluating, handling, storing, testing and disposing of soil and groundwater generated during project excavation and grading activities. Materials generated from excavation and grading activities on the project site shall be tested for potential contaminants prior to re-use as engineered fill on-site. 2. A project-specific Health and Safety Plan that identifies hazardous materials to be used at the project site (e.g., oils, fuels, paints, solvents, and adhesives) and hazardous materials identified in soil, groundwater, and soil vapor through sampling; describes required health and safety provisions and training for all workers potentially exposed to hazardous materials in accordance with State and federal worker safety regulations; and designates the personnel responsible for Health and Safety Plan implementation. 3. A contingency plan that shall be implemented if previously unidentified potentially contaminated material or regulated features (e.g., USTs) are encountered during construction activities. The contingency plan shall include provisions that require notification of the City, Regional Water Board, or any other regulatory agencies with jurisdiction, when potentially contaminated material is encountered. Physical signs of potentially contaminated materials include staining/discoloration, oily sheen or free phase products, odors, the presence of rubble/debris/refuse, or the presence of buried features that may contain | LTS |

Table II-1: Summary of Impacts and Mitigation Measures

| Environmental Impacts | Level of Significance Without Mitigation | Mitigation Measures | Level of Significance With Mitigation |
|------------------------|--|---|---------------------------------------|
| HAZ-1 <i>Continued</i> | | <p>hazardous materials (e.g., drums, buckets, sumps, vaults, or pipelines). The contingency plan shall include guidelines for the collection of soil and/or groundwater samples by a qualified environmental professional prior to further work in the newly discovered affected area. The samples shall be submitted for laboratory analysis by a State-certified laboratory under chain-of-custody procedures. The analytical methods shall be selected by the environmental professional. The analytical results of the sampling shall be reviewed by the qualified environmental professional and submitted to the appropriate regulatory agency, if appropriate. The environmental professional shall provide recommendations, as applicable, regarding soil/waste management, worker health and safety training, and regulatory agency notifications, in accordance with local, State, and federal requirements. Work shall not resume in the area(s) affected until these recommendations have been implemented under oversight by the City, Regional Water Board, or any other regulatory agencies with jurisdiction, as appropriate.</p> <p>4. Designated personnel responsible for implementation of the CRMP.</p> <p>In addition, the following measures shall be implemented:</p> <ul style="list-style-type: none"> The contractor(s) shall designate storage areas suitable for hazardous materials delivery, storage, and waste collection prior to any construction activities. These locations must be as far away from catch basins, gutters, drainage courses, and water bodies as possible. All hazardous materials and wastes used or generated during project site development activities shall be labeled and stored in accordance with applicable local, State, and federal regulations. In addition, an accurate up-to-date inventory, including SDSs, shall be maintained on site to assist emergency response personnel in the event of a hazardous materials incident. | |

Table II-1: Summary of Impacts and Mitigation Measures

| Environmental Impacts | Level of Significance Without Mitigation | Mitigation Measures | Level of Significance With Mitigation |
|------------------------|--|---|---------------------------------------|
| HAZ-1 <i>Continued</i> | | <ul style="list-style-type: none"> • All maintenance and fueling of vehicles and equipment shall be performed in a designated, bermed area, or over a drip pan that will not allow runoff of spills. Vehicles and equipment shall be regularly checked and leaks repaired promptly at an off-site location. Secondary containment shall be used to catch leaks or spills any time vehicle or equipment fluids are dispensed, changed, or poured. • An Emergency Preparedness and Response Plan shall be developed by the contractor(s) for emergency notification in the event of an accidental spill or other hazardous materials emergency during project site preparation and development activities. These procedures shall include evacuation procedures, spill containment procedures, and required personal protective equipment, as appropriate, in responding to the emergency. The contractor(s) shall submit these procedures to the City prior to demolition or development activities. • If the presence of previously unidentified subsurface hazardous materials is confirmed at the project site, site remediation may be required by the applicable State or local regulatory agencies. Specific remedies would depend on the extent and magnitude of contamination and requirements of the regulatory agency(ies). Under the direction of the regulatory agency(ies) and the City, a Site Remediation Plan shall be developed, if necessary. The Site Remediation Plan shall (1) specify measures to be taken to protect workers and the public from exposure to the potential hazards; and (2) certify that the proposed remediation would protect the public health in accordance with local, State, and federal requirements, considering the land use proposed. Excavation and earthwork activities associated with the proposed project shall not proceed until the Site Remediation Plan has been reviewed and approved by the regulatory oversight agency and is on file with the City. | |

Table II-1: Summary of Impacts and Mitigation Measures

| Environmental Impacts | Level of Significance Without Mitigation | Mitigation Measures | Level of Significance With Mitigation |
|------------------------|--|--|---------------------------------------|
| HAZ-1 <i>Continued</i> | | <ul style="list-style-type: none"> • Engineering fill and material to be used for surcharging of the project site shall be tested prior to being imported to the project site or prior to re-use of existing material excavated from the project site to ensure that it would not pose an unacceptable risk to human health or the environment. Threshold criteria for acceptance of engineered fill and surcharging material shall be selected based on screening levels and protocols developed by regulatory agencies for protection of human health and leaching to groundwater (e.g., ESLs). The engineered fill and surcharging materials shall be characterized by representative sampling in accordance with the EPA's SW-846 Test Methods and in accordance with the DTSC's Information Advisory for Clean Imported Fill Material (2001 or most recent version). Fill testing shall be performed by a qualified environmental professional and demonstrated to meet the appropriate threshold criteria. The results of the testing shall be submitted to the City and Regional Water Board for review and approval prior to importing of fill material and surcharging materials to the project site or re-use of material generated from the project site. • The contractor shall prepare a Waste Disposal and Hazardous Materials Transportation Plan, which shall be submitted to the City prior to any demolition and construction activities. This plan shall describe the analytical methods for characterizing wastes and the handling methods required to minimize the potential for exposure, and shall establish procedures for the safe storage of contaminated materials and stockpiling of soils. The required disposal method for contaminated materials, the approved disposal site, and specific routes used for transport of wastes to and from the project site shall be indicated. • Hazardous materials and wastes generated during demolition, grading, and trenching activities, shall be removed, managed, and disposed of in accordance with applicable regulations. | |

Table II-1: Summary of Impacts and Mitigation Measures

| Environmental Impacts | Level of Significance Without Mitigation | Mitigation Measures | Level of Significance With Mitigation |
|---|---|--|--|
| <p><u>HAZ-2</u>: Construction of the proposed project and the project variant could result in accidental releases of hazardous building materials that could result in impacts to construction workers, the public, and/or the environment.</p> | <p>S</p> | <p><u>HAZ-2</u>: Prior to demolition activities, a Hazardous Building Materials Survey (HBMS) shall be performed by an appropriately certified environmental professional which shall identify whether ACMs, PCBs, LBP, or other hazardous materials are present in the existing structures on the project site. Specification for the abatement and disposal of identified hazardous materials in accordance with applicable regulations shall be prepared by an appropriately certified environmental professional. The HBMS and abatement specifications shall be submitted to and approved by the City prior to the start of abatement activities. Abatement activities shall be performed by appropriately certified personnel in accordance with all applicable laws and regulations and documented in a Closeout Report prepared by an environmental professional who shall oversee the abatement activities. The Closeout Report shall be submitted to the City for review and approval prior to the issuance of a demolition permit.</p> | <p>LTS</p> |
| <p><u>HAZ-3</u>: Construction of the proposed project and the project variant could result in potential health risks associated with exposure to VOCs</p> | <p>S</p> | <p><u>HAZ-3</u>: The project applicant shall revise the Response Plan as follows, and to the satisfaction of the Regional Water Board to ensure that potential health risks associated with exposure to VOCs are below established thresholds:</p> <p>The updated risk evaluation required to be performed during implementation of the Response Plan shall conservatively assume that fill material placed on the site would be highly permeable (i.e., assume worst case characteristics of the fill related to attenuation of VOCs), or the engineered fill material to be used at the site shall meet specifications developed by the qualified environmental professional that performs the updated risk evaluation to ensure that the engineered fill meets the characteristics assumed for the updated risk evaluation. Alternatively, additional soil vapor sampling shall be performed at the project site following the placement of fill material and subsequent removal of surcharge fill material to re-evaluate soil vapor intrusion risks based on the actual future condition of the project site.</p> | <p>LTS</p> |

Table II-1: Summary of Impacts and Mitigation Measures

| Environmental Impacts | Level of Significance Without Mitigation | Mitigation Measures | Level of Significance With Mitigation |
|---|--|---|---------------------------------------|
| HAZ-3 <i>Continued</i> | | <p>The Response Plan shall include a requirement for field oversight by a qualified environmental professional during demolition activities involving the removal of pavement surfaces near the former engine repair facility and any other locations where elevated concentration of VOCs (exceeding residential ESLs) have been detected in soil vapor in order to visually evaluate potential source areas of VOCs contamination, and additional sampling shall be performed in the vicinity of the former engine repair facility, particularly in the unpaved areas that surround the former engine repair facility, to attempt to identify the contaminant source area. The Response Plan shall include measures (e.g., excavation and off-site disposal of impacted soil) for remediation of the VOCs contamination source area if it is identified during implementation of the Response Plan. If the VOCs contamination source area is not identified and remediated, soil vapor mitigation systems shall be installed beneath the residential structures that would be located in the vicinity of the former engine repair facility and in the vicinity of any sample locations where VOCs in soil vapor are found to present an unacceptable human health risk (e.g., an ILCR exceeding 1E-06, or HI exceeding 1, or other health risk threshold as determined by the Regional Water Board).</p> <p>The project applicant shall provide written approval from the Regional Water Board of the successful implementation of the Response Plan and proposed residential land use to the City prior to issuance of a certificate of occupancy.</p> | |
| H. HYDROLOGY AND WATER QUALITY | | | |
| HYD-1: If construction of the proposed project or the project variant results in the reuse of existing contaminated soil or contaminated imported fill materials for use as engineered fill or for surcharging, impacts to water quality could occur. | S | HYD-1: Implement Mitigation Measure HAZ-1. | LTS |

Table II-1: Summary of Impacts and Mitigation Measures

| Environmental Impacts | Level of Significance Without Mitigation | Mitigation Measures | Level of Significance With Mitigation |
|---|--|---|---------------------------------------|
| <p>HYD-2: The retaining wall, placement of fill material, reconstruction of Maple Street, or other improvements occurring within the current 100-year flood zone along Redwood Creek could increase the depth and velocity of flood flows along the existing banks, which could result in erosion and siltation during operation of the proposed project and the project variant.</p> | <p>S</p> | <p>HYD-2: Proposed improvements within 100-year flood zones and coastal flooding hazard areas, and proposed improvements affecting stormwater drainage systems (e.g., the proposed retaining wall and placement of fill and/or other potential improvements) shall be analyzed using detailed hydraulic evaluations to ensure that the improvements would not impede or redirect flood flows, contribute to exceeding the capacity of existing stormwater drainage systems, or alter the hydrodynamics of stormwater flows such that erosion could occur. The detailed hydraulic evaluations shall be performed and certified by a professional engineer, and shall quantify the following information.</p> <ul style="list-style-type: none"> • The potential for improvements within 100-year flood zones, coastal flooding hazard areas, and drainage courses to impede or redirect flood flows including storm-related flooding and coastal flooding hazards including tsunamis, sea level rise, and extreme high tides. • The potential for improvements to stormwater drainage systems to exceed the capacity of existing off-site stormwater drainage systems. • The potential for improvements within 100-year flood zones, coastal flooding hazard areas, and drainage courses to result in changes to the extent and depth of flooding, <p>The detailed hydraulic evaluations should also identify receptors and properties that could be affected by the potential changes to flooding conditions. If project improvements could cause erosion, alter existing flooding conditions, or contribute to exceeding the capacity of stormwater drainage systems, project designs shall be modified to reduce the potential flooding and erosion impacts. Modifications to project designs may include the following measures.</p> <ul style="list-style-type: none"> • Altering the location and design of the retaining wall and embankments that would be constructed to raise the elevation of the project site. | <p>LTS</p> |

Table II-1: Summary of Impacts and Mitigation Measures

| Environmental Impacts | Level of Significance Without Mitigation | Mitigation Measures | Level of Significance With Mitigation |
|------------------------|--|---|---------------------------------------|
| HYD-2 <i>Continued</i> | | <ul style="list-style-type: none"> • Installing erosion controls systems such as rock protection or erosion resistant vegetation. • Increasing the size of proposed culverts. • Installing cross-flow culverts for improvements through flood zones. • Improving existing off-site stormwater drainage systems that would receive runoff from the project site. • Installing on-site stormwater detention systems in accordance with the City’s drainage guidelines for residential development. • Including additional storage by replacing the existing storm drain line within Maple Street with a new 48-inch storm drain line or larger from US 101 up to and including the tide gate at Redwood Creek to account for tide gate operation of the existing outfall, as determined by the Engineering and Transportation Division. <p>The detailed hydraulic evaluations and proposed changes to the project designs, if necessary, shall be submitted to the City and any other regulatory agencies that have jurisdiction over the improvements prior to the issuance of a grading permit.</p> | |

Table II-1: Summary of Impacts and Mitigation Measures

| Environmental Impacts | Level of Significance Without Mitigation | Mitigation Measures | Level of Significance With Mitigation |
|--|--|--|---------------------------------------|
| <p><u>HYD-3</u>: Placement of engineered fill to raise the elevation of the project site and placement of surcharge materials would alter existing drainage patterns which could result in flooding of off-site areas during construction of the proposed project and the project variant.</p> | S | <p><u>HYD-3</u>: The project applicant shall prepare a Construction Period Stormwater Drainage Control Plan which shall be submitted to the City for review and approved prior to the issuance of a grading permit. The Construction Period Stormwater Drainage Control Plan shall include figures depicting the proposed grading of engineered fill and surcharge stockpiles and describe construction period drainage control systems (e.g., temporary berms and swales). The plan shall also include detailed hydraulic evaluations of stormwater runoff patterns, including surface runoff flow directions, flow lines within the temporary drainage control systems, and estimated discharge rates and volumes for all site grading and surcharging stages. The proposed grading and temporary drainage control systems shall be designed such that the estimated rates and volumes of surface runoff discharge to existing off-site stormwater drainage systems would not increase beyond the existing condition. If rates and volumes of surface runoff discharge to existing off-site stormwater drainage systems would increase beyond the existing condition, the Construction Period Stormwater Drainage Control Plan shall demonstrate that the existing off-site stormwater drainage systems have capacity to convey the increased discharge.</p> | LTS |
| <p><u>HYD-4</u>: The proposed project and the project variant would result in the alteration of the existing drainage pattern which could contribute to flooding on- and off-site during operation of the project.</p> | S | <p><u>HYD-4</u>: Implement Mitigation Measure HYD-2.</p> | LTS |
| <p><u>HYD-5</u>: The construction and operation of improvements associated with the proposed project and the project variant within 100-year flood zones could potentially impede or redirect flood flows.</p> | S | <p><u>HYD-5</u>: Implement Mitigation Measures HYD-2 and HYD-3.</p> | LTS |
| <p>I. UTILITIES AND SERVICE SYSTEMS <i>There are no impacts to utilities and service systems.</i></p> | | | |

Source: LSA, 2018.

III. PROJECT DESCRIPTION

The following chapter describes the proposed 1548 Maple Street project (project) that is evaluated in this Environmental Impact Report (EIR). The proposed project would result in redevelopment of the project site with 131 three-story for sale, market-rate townhomes, as well as associated open space, circulation and parking, infrastructure, soil remediation, and grading improvements. The project also includes off-site improvements associated with the planned extension of the existing Blomquist Street roadway. Two potential options are considered in this EIR: 1) Partial Blomquist Street Extension to Maple Street (i.e., the “proposed project”); and 2) Partial Blomquist Street Extension to Redwood Creek (i.e., the “proposed project variant”).

A complete description of the proposed project’s regional and local context, planning context, and objectives, is provided, in addition to a discussion of required project approvals and entitlements.

A. PROJECT SITE

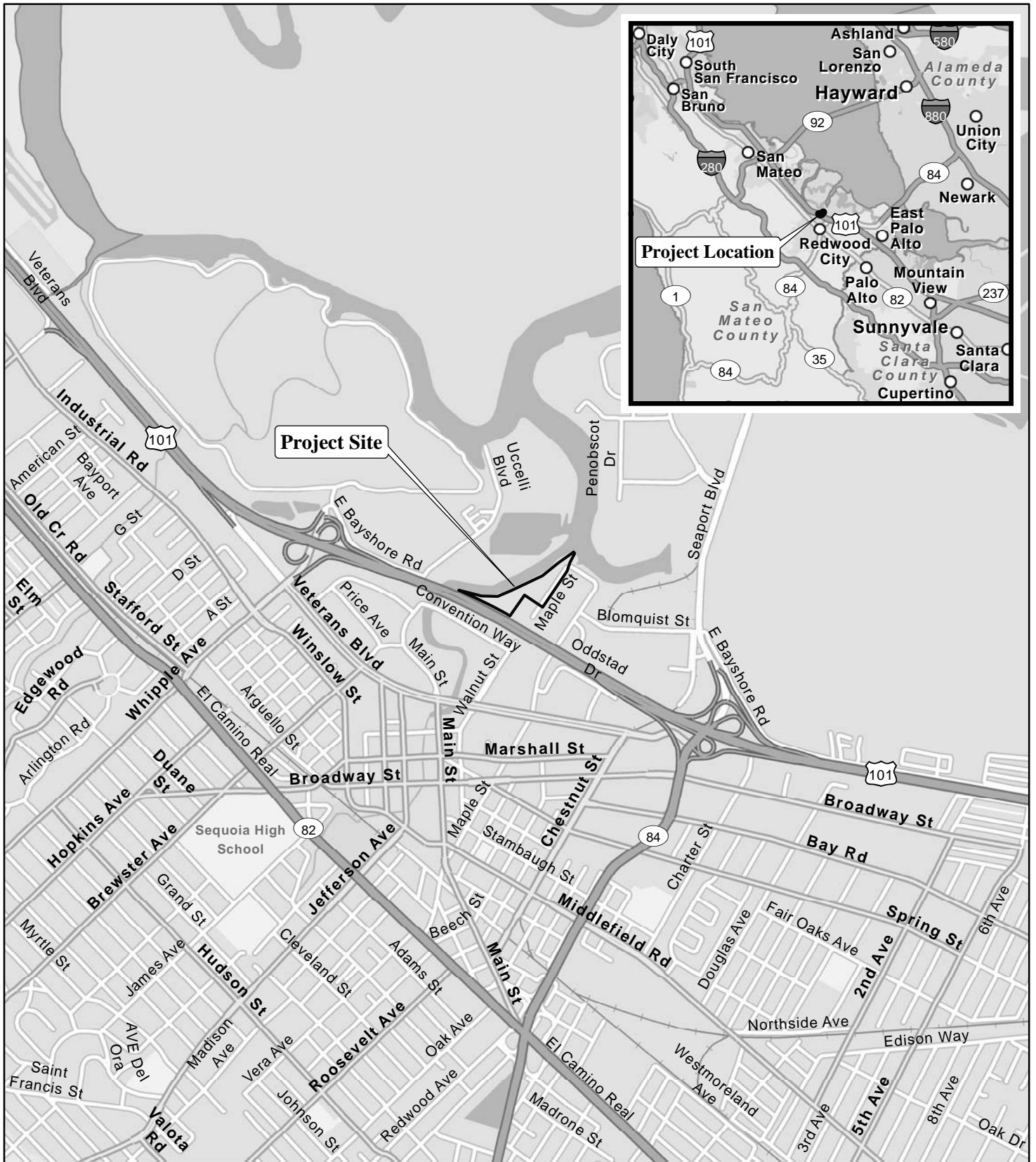
The following discussion describes the geographic context of the project site and provides a brief overview of the existing land uses within and in the vicinity of the site.

1. Location

The approximately 7.88-acre project site is located at 1548 Maple Street within the Redwood Creek/Harbor Center area of the City of Redwood City, San Mateo County. Redwood City is located approximately 25 miles south of San Francisco, at the southern end of San Francisco Bay. The project site is located adjacent to Redwood Creek, which flows into San Francisco Bay. The irregularly-shaped project site is bounded by the existing Docktown Marina and Redwood Creek to the north, Maple Street to the east, institutional uses to the south, and US Highway 101 (US 101) to the west and south.

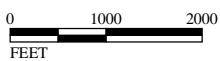
Regional vehicular access to the site is provided by US 101, via the Woodside Road on- and off-ramps located to the east. Direct local access is via Maple Street, Blomquist Street approximately 0.2 miles to the east, and Veterans Boulevard about 0.5 miles to the south of the project site.

Figure III-1 depicts the site’s regional and local context. Figure III-2 depicts an aerial photograph of the project site and vicinity.



LSA

FIGURE III-1



SOURCE: ESRI STREETMAP OF NORTH AMERICA (2012).
 I:\RWC1401D 1548 Maple St\figures\Fig_III.1.ai (3/28/17)

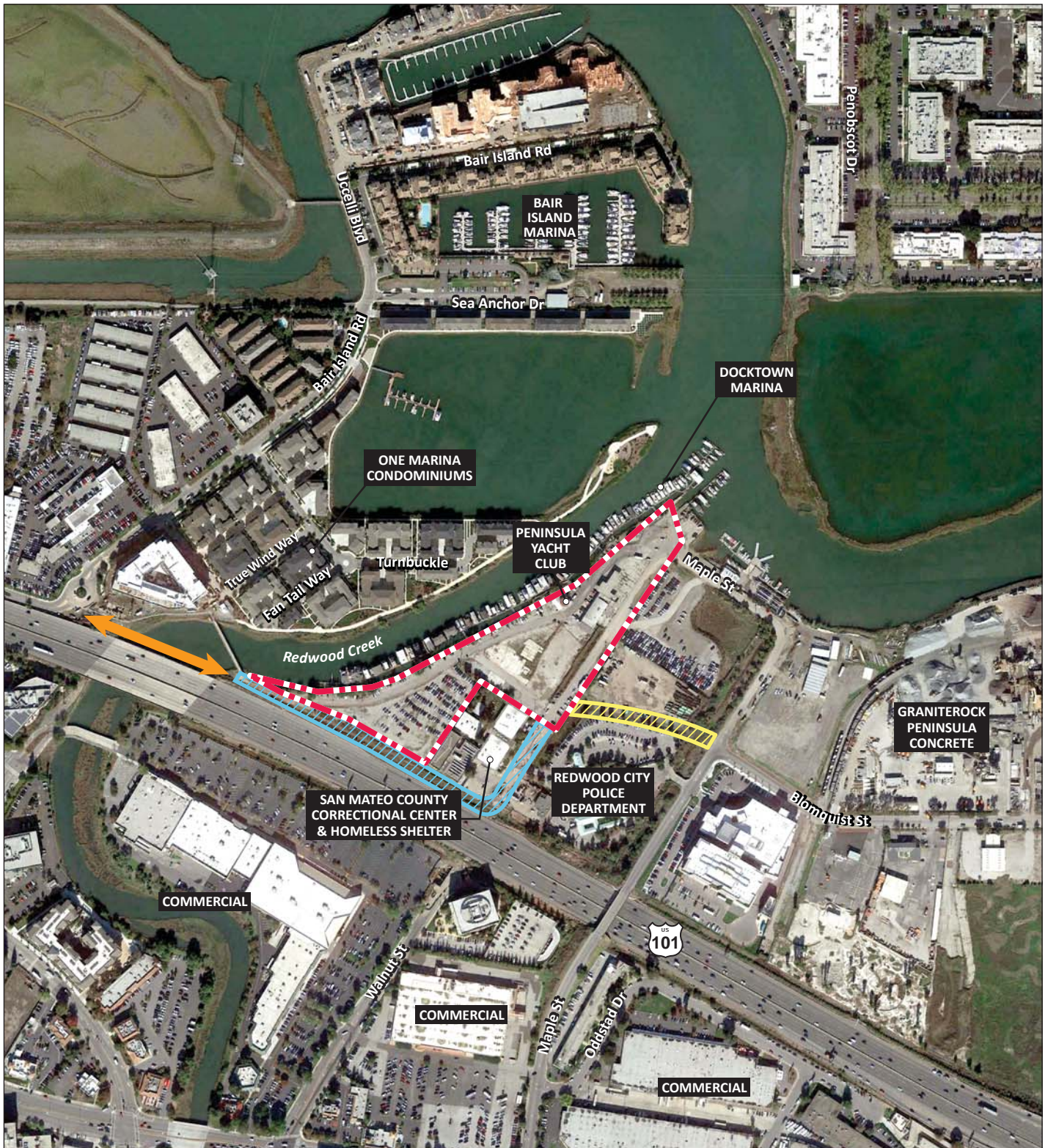
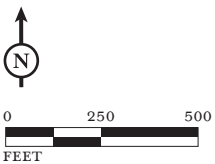


FIGURE III-2

LSA



- Project Site
- Off-Site Project Impact Area
- Off-Site Project Variant Impact Area
- Future Blomquist Street Extension to E. Bayshore Road

1548 Maple Street Project EIR

Aerial Photograph of Project Site and Surrounding Land Uses

SOURCE: STRADA, MARCH 2017.

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2. Surrounding Land Uses

The project site is located within the Redwood Creek/Harbor Center area of the City, which is an approximately 99-acre area primarily developed with light industrial, office, marina-oriented, and institutional uses. The Redwood Creek/Harbor Center area is generally bounded by US 101, waterways, and lands west of Seaport Boulevard.

The docks within Docktown Marina are located north of the site along Redwood Creek. Currently, the marina consists of both live-aboard¹ and non-live-aboard vessels. The City is in the process of implementing the Docktown Plan prepared in 2016 that provides a plan to transition live-aboard vessels out of the Docktown Marina by February 2018.² North of Redwood Creek is the One Marina condominium development, which was completed in 2014 and includes 249 units. At the northwest corner of the project site there is a pedestrian and bicycle bridge that crosses Redwood Creek, providing access between the One Marina development and the project site. Land uses further to the north consist of residential, industrial, and marina-oriented uses, followed by tidal lands and San Francisco Bay.

Bordering the southern corner of the irregularly-shaped site is property owned by San Mateo County and developed with the LifeMoves Maple Street Homeless Shelter and the Maple Street Correctional Center. Further east of the site and across the existing terminus of Maple Street is the Redwood City Police Department and vacant City-owned property. The San Mateo County Sheriff's Correctional Center is located further east, across the Maple Street overpass. To the east of the Correctional Center is a 27-acre area that is proposed for development with approximately 1,000,000 square feet of office improvements.

South and west of the project site is US 101. Immediately south of and adjacent to the project site is the future planned extension of Blomquist Street from its current intersection with Maple Street to East Bayshore Road, as depicted in Figure III-2. Across US 101 land uses consist of commercial and retail uses and the meandering Redwood Creek. Downtown Redwood City is located approximately 1 mile to the south.

3. Site Characteristics and Current Site Conditions

The project site (Assessor's Parcel Numbers [APN] 052-532-010, 052-532-020 and 052-532-030) was formerly occupied by the S.H. Frank Tanning Company between approximately 1890 and 1960. These operations have resulted in the presence of petroleum compounds and chemicals regulated under various federal and State programs within site soils, soil gas, and groundwater at the site.

The generally level site currently ranges between approximately 11 feet above mean sea level (msl) on the south to 8 feet above msl on the north. The site is currently developed with a total of three structures and associated paved surface parking areas. The three existing structures on the site are currently used for site maintenance activities, marina-related storage, diesel engine repair, and marina operations. Existing site conditions are depicted in Figure III-3.

¹ The term "live-aboard vessels" generally refers to both structures located on floating barges and boats that are occupied by residents.

² Overland Pacific & Cutler, Inc., 2016. *Docktown Plan*. December 12.

LEGEND:

| DESCRIPTION | SYMBOL |
|------------------------------------|------------------------------|
| PROJECT BOUNDARY | --- (thick dashed line) |
| ADJACENT LOT LINE | --- (medium dashed line) |
| EASEMENT LINE | --- (thin dashed line) |
| FLOODPLAIN LIMIT | - - - - - (long dashed line) |
| REMOVE OR ABANDON EXISTING UTILITY | //// (hatched line) |
| SANITARY SEWER | SS (line with 'SS' label) |
| FORCE MAIN | FM (line with 'FM' label) |
| STORM DRAIN | SD (line with 'SD' label) |
| WATER | W (line with 'W' label) |
| STORM DRAIN FIELD INLET | ■ (square symbol) |
| CURB INLET | ■ (square symbol) |
| STORM DRAIN MANHOLE | ● (circle symbol) |
| SANITARY SEWER MANHOLE | ● (circle symbol) |
| FIRE HYDRANT | ⊕ (circle with cross symbol) |
| STREET LIGHT | ⊕ (circle with cross symbol) |
| CL/SPOT ELEVATIONS | x 65.0 (text label) |

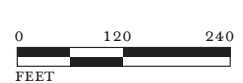
ABBREVIATIONS:

| | |
|------|-----------------------------------|
| AC | ACRE |
| BW | BACK OF WALK |
| EX | EXISTING |
| EVAE | EMERGENCY VEHICLE ACCESS EASEMENT |
| FF | FINISHED FLOOR |
| FG | FINISHED GRADE |
| FU | FUTURE |
| GB | GRADE BREAK |
| HP | HIGH POINT |
| LS | LANDSCAPE |
| LP | LOW POINT |
| MAX | MAXIMUM |
| MIN | MINIMUM |
| PAE | PUBLIC ACCESS EASEMENT |
| PL | PROPERTY LINE |
| PUE | PUBLIC UTILITY EASEMENT |
| R | RADIUS |
| R/W | RIGHT OF WAY |
| SF | SQUARE FEET |
| SD | STORM DRAIN |
| SS | SANITARY SEWER |
| W | WATER |



FIGURE III-3

LSA



Project Site

1548 Maple Street Project EIR
Existing Site Conditions

SOURCES: BKF ENGINEERS; STRADA, 2017.

A 20-foot-tall former water tank, constructed in approximately 1900, is located on the site adjacent to Redwood Creek. The water tank and surrounding 2,300-square-foot building, which is currently improved with a clubhouse, bar, and restaurant, are currently occupied by the Peninsula Yacht Club. A second 6,000-square-foot single-story structure is located in the interior of the site and is used for marina maintenance operations. The third structure consists of an approximately 1,200-square-foot, two-story wood-framed building located on the northeastern end of the site and this building is currently used as the Docktown Marina Harbor office.

An interior access roadway extends from Maple Street along the northern perimeter of the site and provides access to the marina and associated structures and parking areas. The access roadway terminates at the northwest corner of the site. Informal surface parking (approximately 124 spaces) is provided perpendicular to and adjacent to Redwood Creek along the length of the Docktown Marina. A surface parking lot occupies the western half of the site and consists of approximately 73 parking spaces. The lot is currently being used for overflow parking by a local car dealership, located to the north of the site.

Vegetation on the site is generally limited to trees and shrubs along the shore of Redwood Creek, and a small band of shrubs on Maple Street. Three drainage ditches are located on the site, including one located on the southeast side of Maple Street adjacent to the Redwood City Police Department, one on the northwest side of Maple Street, and one located within the Blomquist Street extension area on the western edge of the eastern portion of Maple Street. The rest of the site is covered with existing impervious surfaces consisting of existing buildings and pavements.

4. Regulatory Setting

The project site is currently designated Mixed Use –Waterfront Neighborhood (MU-WF) on the Redwood City General Plan Land Use Policy Map. This land use designation allows for the creation of unique neighborhoods that take advantage of Redwood City’s Bay frontage and allows a residential density of up to 40 dwelling units per acre. The current zoning, Tidal Plain (TP) was not changed when the General Plan was updated and thus would need to be revised to accommodate the project and ensure consistency with the General Plan.

Since 1945, the City of Redwood City has served as a trustee for the land on which the Redwood Creek is located. This only includes the land under the creek, not the land-based property adjacent to the creek. In this role, the City owns the creek area on behalf of the citizens of California. The City must ensure that the land is used in accordance with the statutes that granted the land to the City as well as with the California Constitution, applicable case law, and the common law Public Trust Doctrine. The project site itself is not subject to the Public Trust Doctrine or State Lands Commission jurisdiction.

B. PROJECT BACKGROUND

The project site is located within the study area of the Inner Harbor Specific Plan (IHSP), for which a Draft Environmental Impact Report was prepared and released for public review in 2014.³ The IHSP

³ Redwood City, City of, 2015. *Inner Harbor Specific Plan and Harbor View Project Draft Environmental Impact Report*, State Clearinghouse No. 2014112027. October.

was not adopted and the IHSP Draft EIR was not certified. Work on the IHSP has been suspended indefinitely, and individual landowner proposals (including the proposed project) are currently under independent consideration. Technical documentation and background materials available as part of the IHSP process and applicable to the project site are referenced in this EIR, as appropriate.

C. PROJECT OBJECTIVES

The objectives of the proposed project, as provided by the project applicant, are as follows:

- Develop a townhome community on the waterfront that will appeal to prospective homeowners in the housing constrained and jobs rich San Francisco Peninsula;
- Create a community on a site that offers both proximity to the water in addition to accessibility to the strongest job markets in the nation in Silicon Valley and San Francisco;
- Increase the affordable housing supply by contributing fees in compliance with the City's Affordable Housing Ordinance;
- Develop a community that includes quality architecture, landscape, and streetscape to capitalize on "placemaking" features that define Redwood City's harbor;
- Activate and beautify the waterfront by creating key public recreation amenities via the Bay Trail. Help the City prioritize the waterfront for public-oriented and water-dependent uses and activities;
- Accommodate educational use amenities along the Bay Trail that invite hands-on learning experiences that feature the history and ecology of Redwood City;
- Contribute to a pedestrian and bike recreational thoroughfare connecting Downtown Redwood City to the waterfront that addresses circulation, visual, and aesthetic concerns;
- Provide housing at a scale and density appropriate to the project site and sufficient to support the creation of public waterfront amenities;
- Provide a blend of habitat, recreational, and residential uses within the harbor area;
- Preserve potential historical resources via relocation of the existing water tank to adjacent City-owned property;
- Fortify the site against future sea level rise by raising the site significantly;
- Mitigate lead in soil and volatile organic compounds (VOCs) in soil gas as part of project construction; and
- Mitigate environmental hazards on the site as identified by soils investigations.

D. PROPOSED PROJECT

The proposed project would result in redevelopment of the project site with 131 three-story for sale, market-rate townhomes at a density of 17 units per acre, as well as associated open space, circulation and parking, infrastructure, soil remediation, and grading improvements. The existing water tank on the site would also be retained and relocated to an off-site City-owned location. In addition, the proposed project would provide a 0.87-acre dedication of land for future development of the

Blomquist Street Extension at the southern property line. The City would also vacate a portion of Maple Street to be included into the project area, and the project would result in the reconstruction of Maple Street to provide for adequate access. As part of the proposed project, the applicant may construct a portion of the Blomquist Street Extension to connect to the reconstructed Maple Street or further to Redwood Creek concurrently with this development and within the 0.87-acre area to be dedicated to the City. Both of these potential off-site improvements are considered in this EIR and are referred to throughout this EIR as follows: 1) Partial Blomquist Street Extension to Maple Street (i.e., the “proposed project”); and 2) Partial Blomquist Street Extension to Redwood Creek (i.e., the “proposed project variant”).

Individual project components are further described below. Figure III-4a depicts the conceptual site plan for the proposed project with the Partial Blomquist Street Extension to Maple Street and Figure III-4b depicts the conceptual site plan for the proposed project variant with the Partial Blomquist Street Extension to Redwood Creek.

1. Residential Building Program

A total of 131 townhome units organized within 21 separate buildings would be constructed on the site. Each building would include between four and eight three-story residential units with two stories of living area over a ground floor parking garage. Each unit would include between two- and three-bedrooms and range in size from approximately 1,478 square feet to approximately 1,980 square feet. A total of three individual unit types would be developed, including some with an optional roof deck. Typical building elevations and sections representing four- and eight-unit buildings, both with and without roof-top decks are shown in Figures III-5a, III-5b, III-6a, and III-6b.

A total of seven individual buildings would be oriented towards the waterfront. Waterfront buildings would be set back an average of 40 feet, 6 inches from the property line adjacent to Redwood Creek, with a minimum setback of 36 feet. In addition, the first and second stories would include a first floor porch and second story deck to create a stepback of at least 15 feet from the waterfront. All individual buildings would be set back approximately 20 feet from one another. Building heights would be a maximum of 41 feet in height to the top of the roofline.

The proposed buildings would reflect a transitional architectural style.⁴ Building materials would consist of stone veneer, cementitious lap siding and smooth paneling, three-coat cement plaster, and metal railings and decks. Four color schemes are proposed to provide variation. No highly-reflective glass elements are proposed.

All residential units are proposed to be market rate. The project applicant would contribute fees as required under the City’s Affordable Housing Ordinance.

2. Open Space and Landscaping

The proposed project would include a variety of private and public open space opportunities, as described in detail below. Figure III-7 illustrates the proposed shoreline improvements and building setbacks for the project and Figure III-8 depicts proposed shoreline improvements in relation to

⁴ The transitional architectural style typically refers to the combination of traditional and contemporary materials and finishes equating to a classic, or “timeless” design.

proposed buildings. Conceptual landscape plans that depict the Partial Blomquist Street Extension to Maple Street and further to Redwood Creek are shown in Figures III-4a and III-4b, respectively.

a. Residential Open Space. Private open space for use by individual project residents would be provided in the form of second story decks and roof decks. Total private open space would range between 126 square feet (at Unit B without roof deck) to 641 square feet (at Unit C with a roof deck), depending on the size of the unit.

Common open space for use by project residents would include two garden courtyards, totaling 1,000 square feet each in size that would include hardscape tables, patio seating, and landscaped pathways. A 5,540-square-foot community play area would be located at the center of the site, and would include playground equipment, bicycle parking, and park bench seating.

b. Public Open Space. The proposed project would construct a 12-foot-wide paved segment of the Bay Trail along the northern site perimeter, adjacent to Redwood Creek (see Figure III-8). Two-foot-wide shoulders would be located on both sides of the paved trail, with an additional 8 feet of landscaping on either side, for an overall width of 30 feet. The trail alignment would originate on the eastern end of the development and connect to the existing pedestrian and bicycle bridge over Redwood Creek to the west. Access points to the Bay Trail and shoreline would be provided within the development at a minimum of approximately every 300 feet (for a total of 9 access points). Three public open space areas totaling approximately 20,960 square feet would be included along the Bay Trail with picnic areas, trash and recycling locations, scaled communal furniture, and scenic overlooks.

c. Landscaping. New landscaping, including grasses, plants, shrubs, and trees would be located throughout the new development, along the perimeter of each building and along the site perimeter, including along an improved Maple Street (see Figures III-4a and III-4b). Approximately 262 new trees would be planted on the project site and along the Bay Trail (this does not include the additional trees to be planted along the Blomquist Street right of way, the number of which would be determined by the City's Engineering and Transportation Division). A 30-foot minimum shoreline greenway would contain the 12-foot-wide Bay Trail segment described above, although a portion of this area would temporarily be maintained as a paved access roadway in the short term (see further description below). Figure III-8 depicts the interim and final waterfront improvements.

3. Signage

Signage for the new development would include entryway signs as well as wayfinding signage directing the public to Bay Trail access points. Three types of signage would be installed, including monument, interpretive, and Bay Trail/public waterfront signage. Monument signage would be located at the primary entrances to the project site, including one at the Maple Street entrance and two at the Blomquist Street entrance. Interpretive signage would be designed to engage the public along the Bay Trail, inviting hands-on learning experiences that feature the history and ecology of Redwood City. Approximately five interpretive signs would be located along the Bay Trail. Approximately five signs would also be located at access points to the Bay Trail.



FIGURE III-4a

LSA

NOT TO SCALE



 Project Site

SOURCES: DAHLIN; BKF ENGINEERS; EINWILLERKUEHL, MAY 2017.

I:\RWC1401D 1548 Maple St\figures\Fig_III4a.ai (12/15/17)

1548 Maple Street Project EIR
Conceptual Site Plan - Proposed Project -
Partial Blomquist Street Extension to Maple Street



FIGURE III-4b

LSA

NOT TO SCALE



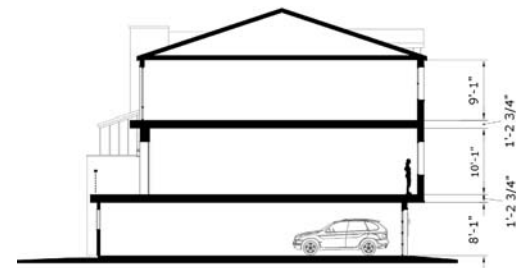
SOURCES: STRADA; DAHLIN; BKF; EINWILLERKUEHL, JULY 2017.

I:\RWC1401D 1548 Maple St\figures\Fig_III4b.ai (12/15/17)

1548 Maple Street Project EIR
 Conceptual Site Plan - Proposed Project Variant -
 Partial Blomquist Street Extension to Redwood Creek



SECTION A-A



SECTION B-B



REAR ELEVATION



RIGHT ELEVATION (LEFT ELEVATION SIMILAR)



FRONT ELEVATION



AERIAL PERSPECTIVE

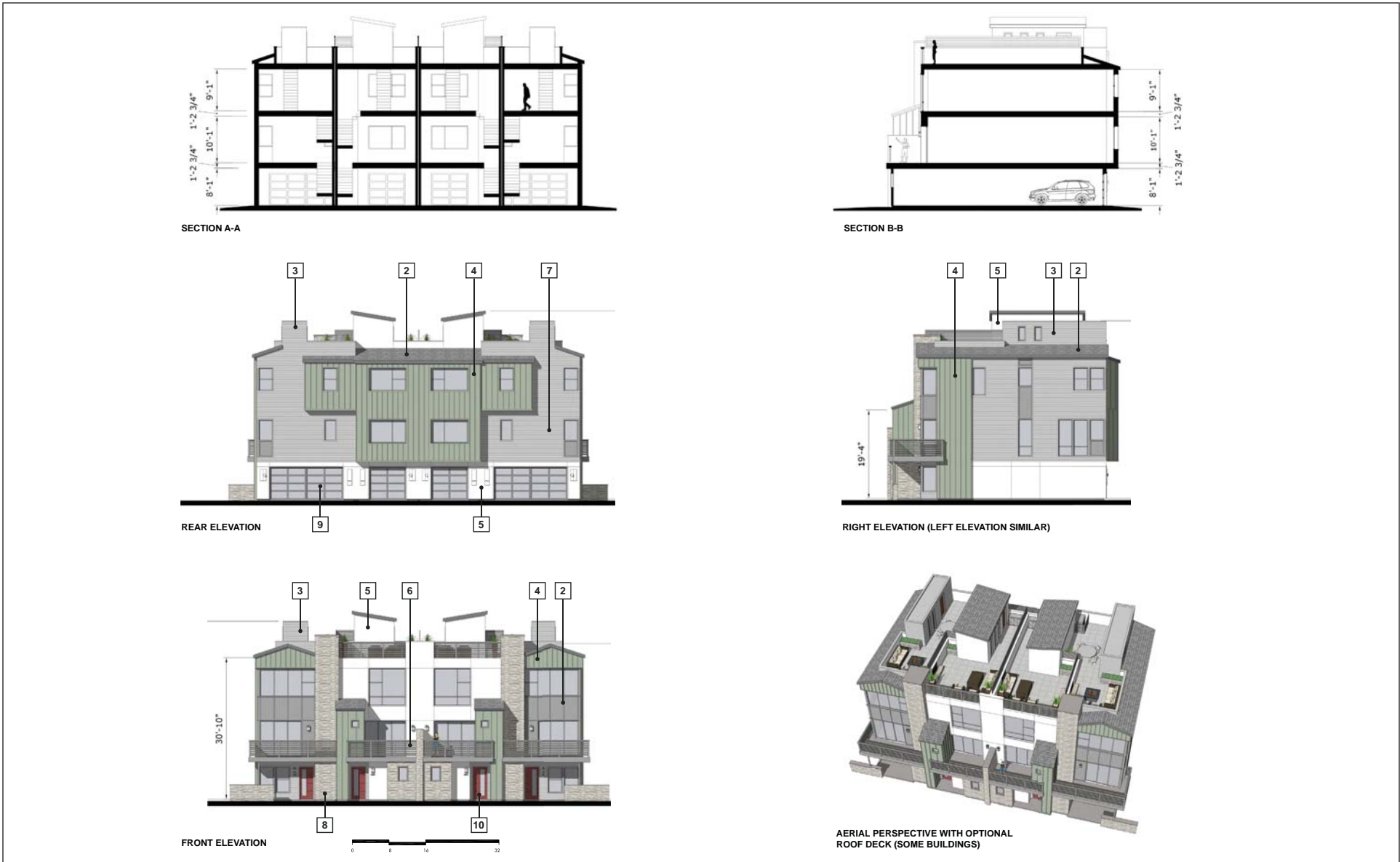


FIGURE III-5b



FIGURE III-6a



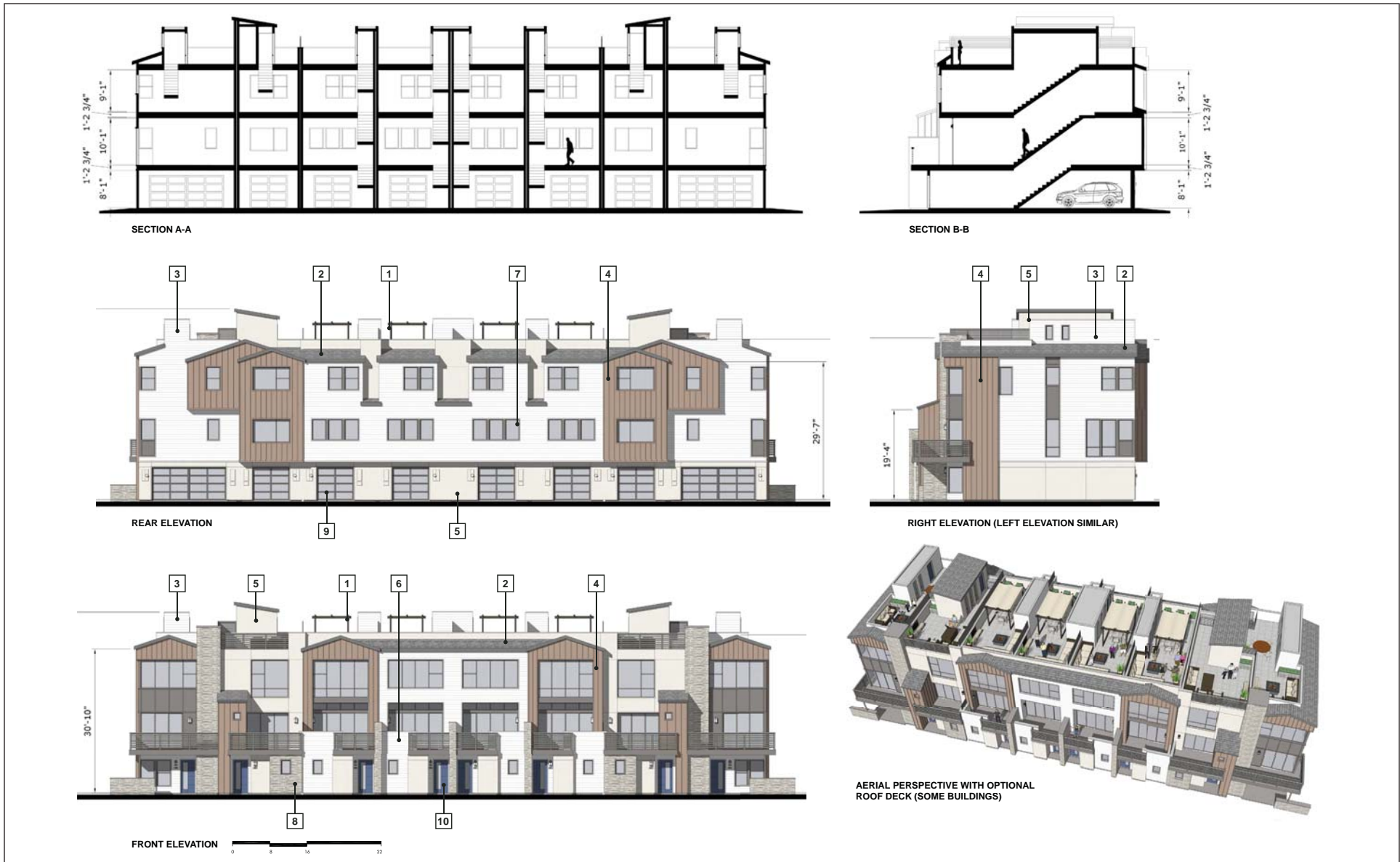
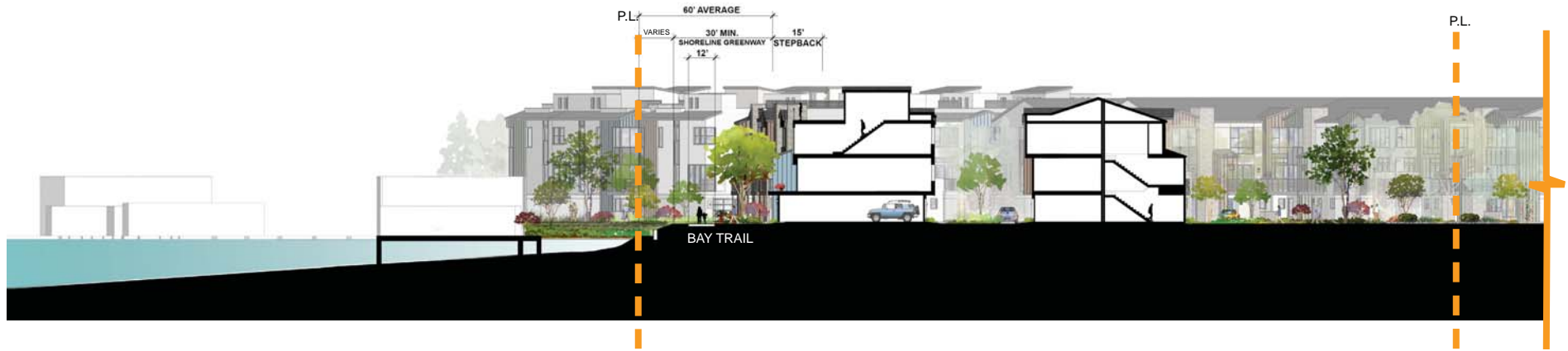
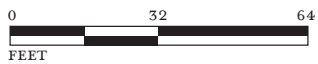


FIGURE III-6b



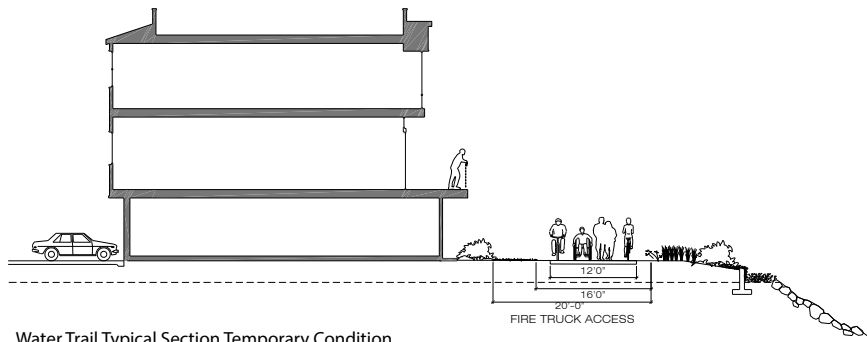
LSA

FIGURE III-7

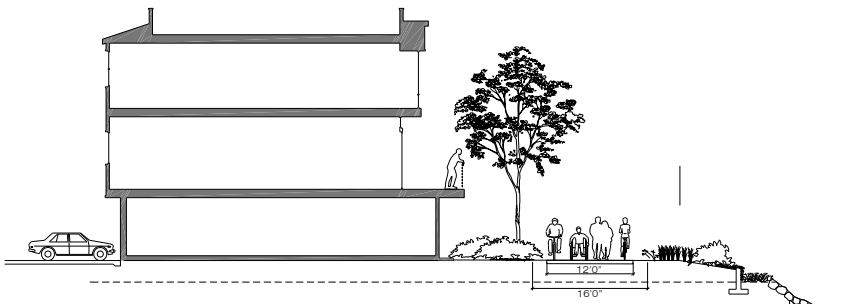


SOURCE: STRADA, MARCH 2017.

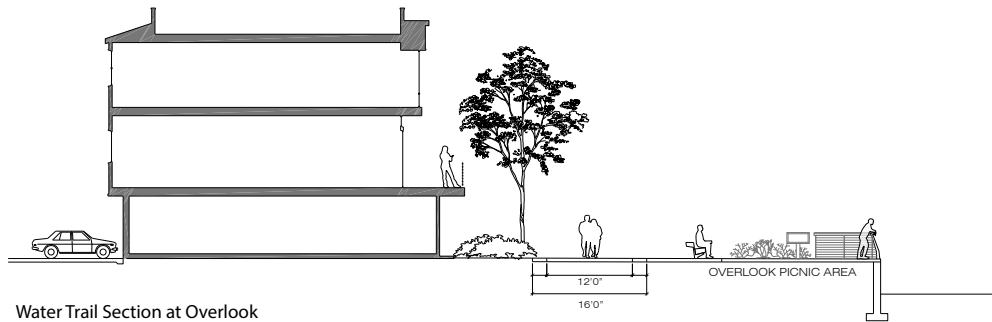
1548 Maple Street Project EIR
Proposed Shoreline Improvements and Building Stepbacks



Water Trail Typical Section Temporary Condition



Water Trail Typical Section Final Condition



Water Trail Section at Overlook

WATER TRAIL SECTIONS

4. Lighting

Lighting is proposed to include 19 pedestrian pole light fixtures throughout the parking areas and drive aisles. Pole lights would have shielded fixtures to eliminate visible light sources from outside of the development. A comprehensive lighting program for the proposed project would be submitted for approval by the City prior to issuance of construction permits.

5. Access, Circulation and Parking

Primary access to the project site would be provided by two access points, including the improved internal section of Maple Street and the proposed extension of Blomquist Street from Maple Street north of the Police Station property to the newly reconstructed Maple Street. The improved segments of Maple Street and the Blomquist Street Extension to Maple Street would terminate at the southeast corner of the site, adjacent to and north of the San Mateo County Correctional Center (refer to Figure III-4a). Two new drive aisles off of Maple Street would provide ingress and egress to a new internal roadway on the site. Internal circulation would consist of the new internal roadway, which would extend along the majority of the northern length of the site, where it would terminate at the northwest corner, and internal drive aisles located between individual buildings. Internal roadways would be a minimum of 26 feet in width, with alleys a minimum of 20 feet.

As previously discussed, as a variant to the proposed project, the project could also include a second segment of the Blomquist Street Extension that includes extending the roadway from its current terminus at Maple Street further to Redwood Creek (refer to Figure III-4b). This second segment would provide a third access point to the internal driveways within the project site (between Buildings S and U).

A temporary 4-foot-wide paved area would be located along the length of the northern property line and adjacent to the Bay Trail to maintain a 20-foot-wide corridor for emergency access to the Docktown Marina. The 20-foot emergency access road would consist of 16 feet of pavement and 2-foot shoulders. At such time emergency access is no longer needed, the roadway would be converted to open space with additional tree planting, seating, and landscaping.

Pedestrian access throughout the site would be provided via internal walkways and sidewalks. Sidewalk widths throughout the development would be a minimum of 4 feet.

Each townhome unit would include two-vehicle parking garage at the ground level, for a total of 262 off-street parking spaces. Approximately 85 units would include tandem parking. A minimum of 24 (8 percent of the total) vehicle parking spaces are required to include dedicated electric vehicle charging stations; each residential parking garage would include at least one charging station, for a total of 131 parking spaces that can be utilized by electric vehicles.

A total of 35 on-street guest parking spaces would be provided throughout the development and 45 on-street public parking spaces would be provided in dedicated parking spaces on the improved Maple Street. Of these on-street spaces, a total of two spaces would be ADA-compliant.

Bicycle parking would be provided at three locations along the Bay Trail of which a total of 6 bicycle parking spaces would be dedicated for use by project residents and 18 spaces for public use. Two additional bicycle parking locations are located on the project site that would provide parking for 16 additional bicycles, resulting in a total of 40 on-site bicycle parking spaces.

6. Water Tank Relocation

The proposed project would result in dismantling of the existing water tank and relocation of the structure to City-owned property located near the waterway within the Inner Harbor area, per the proposed Development Agreement (discussed below). The exact location is currently unknown at this time; however, it is anticipated that the dismantled water tank would be stored on City property within the vicinity until such time that nearby open space areas are developed. The water tank would then be relocated to these areas.

7. Utilities and Infrastructure

Existing water, sewer and storm drainage infrastructure exists within and in the vicinity of the project site. Connections to these utilities would need to be extended or expanded to accommodate the proposed project.

a. Water. Water service to and within the project site is provided by the City of Redwood City. The site is located within the City's Main Pressure Zone and an existing 12-inch water line is located along Maple Street beginning across US 101 and traveling north towards the Bay. This line supplies the existing site as well as the adjacent Docketown area with potable water. Water service to the site would be provided through one new 8-inch line located at the entrance to the site at Maple Street, and connecting to the existing 12-inch line. The connection would have an 8-inch Compound Water Meter that is approved for fire service applications and a 10-inch Reduced Pressure Principle Assembly (RPPA) or similar products as approved by the City. The on-site distribution lines would be a combination of 8-inch and 10-inch pipes. Hydrant laterals would be 6-inches in diameter. The project would also include a 24-inch high-density polyethylene (HDPE) pipeline underneath the Blomquist Street Extension (both segments).

In addition, the proposed project would connect to the recycled water main at the intersection of Maple Street and Blomquist Street. The recycled water system conveys non-potable flows from the Silicon Valley Clean Water (SVCW) treatment plant. Recycled water would be used for landscape irrigation and other non-potable purposes. In order to loop the system, the recycled water main would go through the site and connect to the existing recycled water system within the Caltrans right-of-way west of the western property line with a 10-inch HDPE pipeline.

b. Wastewater. Sanitary sewer service to the project site is provided by facilities owned and maintained by the City of Redwood City for transporting sewage flows and facilities operated by SVCW for treating the sewage. The existing off-site sewer system includes an 8-inch line on Maple Street which flows to the existing 48-inch sewer main on Maple Street. The 48-inch main connects to a pump station where Maple Street intersects with US 101. From the pump station the sewer system is able to pump the sewage through a 48-inch force main to the north parallel to US 101 and eventually to the SVCW treatment plant.

The proposed project would connect to the existing off-site 8-inch sewer line that currently serves the existing area. A new 8-inch sewer line would run through the project site and tie into the existing 8-inch City line on Maple Street.

c. Stormwater. The existing project site is almost entirely covered by impervious surfaces (a total of approximately 6.4 acres). The proposed project would result in a net decrease in impervious surface coverage of approximately 1.4 acres compared to existing conditions. The existing surface

runoff is routed to a bio-swale located at the east side of the property, then discharges to Redwood Creek through the existing creek outfall at north of the site. The proposed project would install a bio-retention system that would capture the on-site storm water runoff into bio-retention areas, within various locations throughout the site. The stormwater would be filtered and cleaned through the bio-retention areas and released into the on-site storm drain system. The on-site storm drain system would connect to the City main line in Maple Street and continue to discharge to Redwood Creek. In addition to on-site stormwater treatment and detention, the work related to the Blomquist Street extension and the Maple Street reconstruction will also require off-site stormwater treatment. Additionally, due to reconstruction of Maple Street the City main line in Maple Street would be replaced with a 48-inch storm drain up to and including the tide gate at Redwood Creek

d. Other Utilities. Other utilities that would be provided to the project site include telephone service by AT&T or Verizon, and gas and electrical services by Pacific Gas & Electric (PG&E). All existing overhead utilities along the project frontage and within the improved Maple Street roadway would be undergrounded. The proposed project would meet the requirements of CalGreen.

8. Site Remediation

As previously discussed, former uses at the site have resulted in the presence of petroleum compounds and chemicals regulated under various federal and State programs within site soils, soil gas, and groundwater at the site. Discrete locations of the site including lead and volatile organic compounds (VOCs) (benzene, chlorobenzene, and/or ethylbenzene) have been identified on the site at levels above residential screening levels.

The applicant submitted a Request for Agency Oversight to the California Protection Agency (CalEPA) and applied for a California Land Reuse and Revitalization Act (CLRRA) Agreement. Under the CLRRA process, the project applicant is preparing a Response Plan⁵ for review and approval by the Regional Water Quality Control Board (Regional Water Board). The Response Plan includes additional sampling to more precisely delineate the area(s) where lead exceeds residential screening levels and additional soil vapor sampling to establish whether vapor mitigation is warranted. Refer to Section IV.G, Hazards and Hazardous Materials of this EIR for additional information.

It is estimated that a maximum of 1,500 cubic yards of soil containing lead may require removal; this volume would be refined following additional sampling. If additional sampling indicates vapor mitigation is required, mitigation is anticipated to range from a spray-applied vapor barrier placed beneath building slabs to a subslab piping collection system placed beneath a barrier with riser pipes that sweep vapors to discharge points above roof levels. Required response actions, if any, would be implemented as part of the site construction process under oversight by the Regional Water Board.

9. Demolition, Grading and Construction

All existing vegetation and trees within the project development area would be removed. A total of approximately 42 trees which are classified as protected by the City's Municipal Code would be removed with development of the proposed project and an additional 5 protected trees would be

⁵ Langan Engineering and Environmental Services, Inc., 2017. *Response Plan, 1548 Maple Street Development, Redwood City, California*. December 8.

removed with development of the project variant. In addition, existing structures and pavements on the site would be demolished and/or removed from the site. The existing water tank would be relocated off-site to City-owned property, although the location is unknown at this time. Construction debris, such as old foundations, pavements, and structures, would be collected and hauled off-site for disposal. Approximately 10,000 tons of demolition waste would be generated by the project.

As described above, the existing topography of the site ranges between 8 and 11 feet above msl. Portions of the project site are located within the 100-year flood hazard zone as defined by the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (Zone AE), with a base flood elevation of 10 feet (NAVD88). The project site would be raised approximately 3 feet (36 inches) above the base flood elevation, to an elevation of 13 feet to account for future conditions anticipated to occur with sea level rise. In addition, the site requires surcharge⁶ of 6 feet to avoid future settlement of building loads. Due to the presence of undocumented fills, the site would also be over-excavated in settlement-sensitive areas to provide a minimum engineered fill cap of at least 5 feet.

Including remediation, raising of the base elevation, surcharge, and over-excavation activities, a total of approximately 14,350 cubic yards of soil would be excavated from the site and off-hauled and a total of 67,750 cubic yards of fill would be brought to balance the site. Excavation depths would not exceed 10 feet in depth for utility trenching and installation of a shallow foundation system with 14-inch post-tension slabs poured on-grade. No pile driving is proposed.

A 2 to 3-foot-tall retaining wall would be installed at the shoreline to maintain the new grade. The façade of the new wall would be located a minimum of 5 feet from the existing top of bank and the top of the wall would reach about 6 feet above the mean high water line. In addition, to restore the existing area where the proposed outlook would be located, and to bring it up in elevation to accommodate sea level rise, the applicant proposes to remove a portion of the existing dilapidated concrete outlook structure which now constitutes the edge of the Redwood Creek bank. An approximately 5-foot-wide stretch of slumping concrete would be removed, pulling the edge of the creek bank upland and expanding the acreage of waters of the State and U.S. The outlook area would then be built starting at the new edge of the top of bank, extending up several feet to accommodate sea level rise and match the proposed project site elevation. Removal of the dilapidated concrete structure would occur at low tide when the concrete is exposed, so no in-water work would occur at the outlook. No new pilings or other fill within waters of the State or U.S. are proposed.

If approved, construction of the project is anticipated to begin in early 2019 and would occur over a 33 month period. Demolition activities are anticipated to occur over an approximately 3 month period and grading would occur over a 12-month period. Exterior work such as foundation installation, building construction, and installation of pavements is expected to occur over an 18 month period. Project occupancy is expected to occur in late 2021.

⁶ Surcharging is when a layer of fill material is temporarily placed over compressible soil so that settlement occurs prior to the construction of structures that could otherwise be affected by settlement.

E. DISCRETIONARY ACTIONS

The proposed project would require a series of discretionary actions as discussed below.

1. Development Agreement

The City and the project applicant/developer are negotiating a Development Agreement, which would provide, among other things:

- Developer's construction of land-side improvements along the northern waterfront edge to address sea-level rise and construction of the Bay Trail;
- Developer's granting of a public access easement to the City for the Bay Trail;
- Land swap agreement pursuant to which the project applicant would grant land to the City for both segments of the Partial Blomquist Street Extension and the City would grant land along the southern Maple Street edge of the property for project improvements;
- Developer's construction of the Partial Blomquist Street Extension between Maple Street and Redwood Creek (project variant); and
- Relocation of the existing water tank to adjacent City-owned property.

2. Zoning Map and Text Amendment

As previously described, the project site is located within the Tidal Plain zoning designation, which does not allow for development. The project applicant is requesting that the project site be rezoned to a new zoning designation, Mixed Use Waterfront, to allow development of the proposed residential use. The text of the Zoning Ordinance would be amended to include the description of the new designation, as follows:

The Mixed Use Waterfront District allows for primary uses such as housing, marinas and commercial that support residents and visitors to the waterfront. Commercial uses that do not support waterfront uses are generally considered secondary and should be located away from the waterfront, behind the primary uses. Public access and open space amenities are required along the waterfront. Maximum residential density is 40 du/acre and maximum commercial intensity is 0.4 FAR. Buildings shall be limited to five stories with stricter height limitations along creek and waterfront areas. Developments shall provide common useable open space. Parking shall meet the standards of the Article 30 (Parking) of the zoning ordinance, with additional flexibility for tandem spaces and shared use parking. The District shall require mitigations to address sea level rise where appropriate and include a community benefits program.

3. Vesting Tentative Map

Vesting Tentative Map approval would be required to authorize subdivision of the project site into both residential lots and common area lots to accommodate the proposed development. The site would include 131 fee-simple lots to be sold as townhomes. All on-site common areas, roadways, stormwater features, and public open space areas, including the Bay Trail, would be maintained by a Homeowner's Association (HOA).

4. Use Permit

The City requires a Use Permit for development within 500 feet of the outermost lane of a freeway (and in no case is development allowed within 100 feet). The proposed project would be set back approximately 125 feet from the outermost lane of US 101, which will require a Use Permit.

5. Sign Permit

A sign permit would be required for all on-site signage, including development signage, public access signage and designation of the Bay Trail.

6. Response Plan

The project would include remediation activities pursuant to a Response Plan⁷ that is being developed in consultation with and with the approval of the Water Board. The Response Plan will detail the required mitigation for hazardous soil and soil gas conditions within isolated areas of the project site, where lead and VOCs are known to exceed residential screening levels.

F. PERMITS AND APPROVALS

A number of permits and approvals, including the discretionary actions above, would be required to allow development of the proposed project. As lead agency for consideration of the proposed project, the City of Redwood City would be responsible for the majority of the approvals required for project development. Other agencies also may have some authority related the project and its approvals. A list of required permits and approvals, including the discretionary actions described above, which may be required by the City and other agencies, is provided in Table III-1.

Table III-1: Required Permits and Approvals

| Lead Agency | Permit/Approval |
|---|--|
| City of Redwood City | <ul style="list-style-type: none"> • Development Agreement • Zoning Map and Text Amendment • Vesting Tentative Map • Use Permit • Sign Permit • Environmental Review • Demolition/Grading/Building Permits • Approval of wastewater hookups. |
| Responsible Agencies | |
| Army Corps of Engineers (Corps) | <ul style="list-style-type: none"> • Section 404 Permit for work within Redwood Creek • Section 10 Permit for work within Redwood Creek |
| California Regional Water Quality Control Board (Water Board) | <ul style="list-style-type: none"> • California’s Land Reuse and Revitalization Act (CLRRA) Response Plan for site remediation • National Pollutant Discharge Elimination System (NPDES) permit for stormwater discharge • Section 401 water quality certification |
| California Department of Fish and Wildlife | <ul style="list-style-type: none"> • Section 1602 Streambed Alteration Agreement |

Source: LSA Associates, 2017.

⁷ Langan Engineering and Environmental Services, Inc., 2017, op. cit.

IV. SETTING, IMPACTS, AND MITIGATION MEASURES

This chapter contains an analysis of each potentially significant environmental issue that has been identified for the proposed 1548 Maple Street Project (project) and the proposed project variant. The following: 1) identifies how a determination of significance is made; 2) identifies the environmental issues addressed in this chapter; 3) describes the context for the evaluation of cumulative effects; 4) lists the format of the topical issue section; and 5) provides an evaluation of each potentially significant issue in Sections A through I. Unless otherwise noted in this EIR, impacts associated with implementation of the proposed project and project variant would be similar and are not differentiated.

DETERMINATION OF SIGNIFICANCE

Under CEQA, a significant effect is defined as a substantial, or potentially substantial, adverse change in the environment.¹ The CEQA Guidelines direct that this determination be based on scientific and factual data. Each impact evaluation in this chapter is prefaced by criteria of significance, which are the thresholds for determining whether an impact is significant. These criteria of significance are based on the CEQA Guidelines and applicable City policies. In determining whether a project's impacts are significant, an EIR ordinarily compares those impacts with existing environmental conditions which are referred as the "baseline" for the impact analysis. This EIR compares the project impacts with environmental conditions in existence at the time this EIR was being prepared.

ISSUES ADDRESSED IN THE DRAFT EIR

Sections A through I of this chapter describe the environmental setting of the project as evaluated in the EIR and the impacts that are expected to result from implementation of the proposed project. Mitigation measures are proposed to reduce potential impacts, where appropriate. The following environmental issues are addressed in this chapter:

- A. Land Use and Planning
- B. Biological Resources
- C. Cultural Resources
- D. Transportation and Circulation
- E. Air Quality
- F. Noise
- G. Hazards and Hazardous Materials
- H. Hydrology and Water Quality
- I. Utilities and Service Systems

¹ *CEQA Guidelines*, 2017. Section 21068.

Preliminary analysis provided in the Initial Study (Appendix B) determined that development of the proposed project or project variant would not result in significant impacts to the following environmental topics: aesthetics; agricultural and forestry resources; geology and soils; greenhouse gas emissions; mineral resources; population and housing; public services; and tribal cultural resources. Consequently, these issues are not examined in this EIR (but are discussed briefly in Chapter VI, Other CEQA Considerations).

CUMULATIVE ANALYSIS CONTEXT

CEQA defines cumulative as “two or more individual effects which, when considered together, are considerable, or which can compound to increase other environmental impacts.” Section 15130 of the CEQA Guidelines requires that an EIR evaluate potential environmental impacts when the project’s incremental effect is cumulatively considerable. “Cumulatively considerable” means that the incremental effects of an individual 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. These impacts can result from a combination of the proposed project together with other projects causing related impacts. “The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonable foreseeable probable future projects.”

The methodology used for assessing cumulative impacts typically varies depending on the specific topic being analyzed. CEQA requires that cumulative impacts be discussed using either a list of past, present, and probable future projects producing related or cumulative impacts, or a summary of projections contained in an adopted local, regional, or Statewide plan, or related planning document, that describes or evaluates conditions contributing to the cumulative effect. This EIR uses the plan approach to evaluate cumulative impacts.

The cumulative land use assumptions include the Association of Bay Area Governments projections for year 2040 with refinements to reflect under construction, approved, and pending development projects in Redwood City. The 2040 land use assumptions include the Inner Harbor Specific Plan, the recently completed County Jail, development projected in the Downtown Redwood City Precise Plan, Kaiser Hospital Specific Plan, 851 Main, and the Stanford in Redwood City development. Since the IHSP was not approved, projected development related to the Plan were not considered in the analysis.

The Redwood City General Plan describes the City’s framework for growth between 2010 and 2030, which includes anticipated changes in housing, population, and employment. The General Plan envisioned a mix of residential, commercial office, commercial retail, and low-intensity industrial land uses within the Inner Harbor area and these uses are considered in the cumulative analysis.

CEQA also specifies that lead agencies should define the geographic scope of the area affected by the cumulative effect and provide a reasonable explanation for the geographic limitation used. The cumulative geographic context for most project impacts generally extends for an approximately 0.25-mile radius around the site. However, the geographic scope for each topical area may be different depending upon the nature of the environmental impact being evaluated. For example, the geographic and temporal (time-related) parameters related to a cumulative analysis of air quality impacts are not necessarily the same as those for a cumulative analysis of noise impacts because the geographic area that relates to air quality is much larger and regional in character than the geographic area that could

be affected by potential noise impacts from a proposed project and other cumulative projects/growth. The cumulative noise impacts are more localized than air quality and transportation impacts, which are more regional in nature. Accordingly, the parameters of the respective cumulative analyses in this document are determined by the degree to which impacts from this project are likely to occur in combination with other development projects.

Refer to the appropriate discussion in each topical section for further discussion of the cumulative assumptions relevant topic.

FORMAT OF ISSUE SECTIONS

The environmental topical section comprises two primary parts: (1) Setting and (2) Impacts and Mitigation Measures. An overview of the general organization and the information provided in the two parts is provided below:

- *Setting.* The Setting section for the environmental topic generally provides a description of the applicable physical setting (e.g., existing land uses, existing traffic conditions) for the project site and its surroundings in Redwood City. An overview of regulatory considerations that are applicable to each specific environmental topic is also provided.
- *Impacts and Mitigation Measures.* The Impacts and Mitigation Measures section for the environmental topic presents a discussion of the impacts that could result from implementation of the proposed project and the project variant. The section begins with the criteria of significance, which are the thresholds used to determine whether an impact is significant. The latter part of this section presents the impacts from the proposed project options and mitigation measures, if required. The impacts of the proposed project options are organized into separate categories based on the criteria listed in each topical section. Cumulative impacts are also addressed.

Impacts are numbered and shown in bold type, and the corresponding mitigation measures are numbered and indented. Impacts and mitigation measures are numbered consecutively and begin with an acronymic or abbreviated reference to the impact section (e.g., TRA). The following symbol is used for individual topics:

| | |
|-----|---------------------------------|
| LU | Land Use and Planning Policy |
| BIO | Biological Resources |
| CUL | Cultural Resources |
| TRA | Transportation and Circulation |
| AQ | Air Quality |
| NOI | Noise |
| HAZ | Hazards and Hazardous Materials |
| HYD | Hydrology and Water Quality |
| UTL | Utilities and Service Systems |

Impacts are also categorized by type of impact, as follows: Less-Than-Significant (LTS), Significant (S), and Significant and Unavoidable (SU).

ENVIRONMENTAL ISSUES

Sections A through I of this chapter describe the environmental setting of the project as it relates to each specific environmental topic evaluated in the EIR and the impacts that are expected to result from implementation of the proposed project. Mitigation measures are recommended to reduce potential impacts, where appropriate.

A. LAND USE AND PLANNING

This section describes the existing land uses on and around the project site. Potential impacts related to land use and planning that could result from development of the proposed project are identified, and mitigation measures are recommended, as appropriate.

This section also evaluates the project's consistency with applicable planning policies. While this section contains a discussion of the consistency of the project with relevant land use policies, policy conflicts, in and of themselves, do not constitute a significant environmental impact. Policy conflicts are considered to be environmental impacts when they would result in direct physical impacts. Therefore, land use policies are discussed in this section for informational purposes only. All other associated physical impacts are discussed in this EIR in specific topical sections such as noise, air quality, and transportation.

In addition, the analysis contained in the Initial Study (Appendix B) determined that the proposed project would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or State habitat conservation plan and this topic is not further discussed in this section.

1. Setting

The following subsections provide an overview of the project location, the project site, and adjacent existing and planned land uses. Land uses on the project site and adjacent areas are shown in Figure IV.A-1 and are described below. Figures IV.A-2a through IV.A-2d show photographs of the project site and surrounding area. Photo locations are shown in Figure IV.A-1.

a. Overview. Redwood City is approximately 34.4 square miles and is located on the western shore of San Francisco Bay in San Mateo County (County). The City is bordered to the north by the cities of San Carlos and Foster City, to the west by unincorporated areas of the County and Interstate 280 (I-280), to the south by the Town of Atherton and the City of East Palo Alto, and to the east by San Francisco Bay.

The project site is located in northeast Redwood City and is approximately 25 miles south of San Francisco, as shown in Figure III-1 in Chapter III, Project Description. The project site is located within the Redwood Creek/Harbor Center area of the City. The project site is accessible via US Highway 101 (US 101) via the Woodside Road on- and off-ramps located to the east. The project site is located adjacent to Redwood Creek, which flows into San Francisco Bay.

b. Existing Land Use. The irregularly-shaped project site is approximately 7.88 acres in size. Existing buildings are generally located on the northeastern portion of the project site. Existing structures on the project site are currently used for site maintenance activities, marina-related storage, diesel engine repair, and marina operations. A 20-foot-tall former water tank and surrounding 2,300-square-foot building, which is currently improved with a clubhouse bar and restaurant, are currently occupied by the Peninsula Yacht Club (Photo 1). A second 6,000-square-foot single-story structure is located in the interior of the site and is used for marina maintenance operations (Photo 2). The third structure on the project site consists of a two-story, 1,200-square-foot wood-frame structure that is currently used as the Docktown Marina Harbor office (Photo 3).

An interior access roadway extends from Maple Street along the northern perimeter of the site and provides access to the marina and associated structures and parking areas. The access roadway terminates at the northwest corner of the site. Informal surface parking (approximately 124 spaces) is provided perpendicular to and adjacent to Redwood Creek along the length of the Docktown Marina. The surface parking lot that occupies the western half of the site consists of approximately 73 parking spaces, and is currently being used as an overflow parking lot by a local car dealership, which is located north of the site. Photo 4 depicts the surface roadway and parking areas on the site.

c. Existing Land Use in the Vicinity of the Project Site. The following provides a description of the existing land uses within the vicinity of the project site.

(1) Areas to the North. The existing docks within Docktown Marina are located north of the project site along Redwood Creek. Photo 5 depicts the creek area and Photo 6 depicts existing uses at Docktown Marina. Currently, the marina consists of both live-aboard¹ and non-live-aboard vessels. The City is in the process of implementing the Docktown Plan prepared in 2016 that provides a plan to transition live-aboard vessels out of the Docktown Marina by February 2018². At the northwest corner of the project site is a pedestrian and bicycle bridge that crosses Redwood Creek. North of Redwood Creek is the One Marina development, which was completed in 2014 and includes 249 residential units and an approved hotel currently under construction. Land uses further to the north consist of residential, industrial, and marina-oriented uses, followed by tidal lands and San Francisco Bay.

(2) Areas to the East. Bordering the southern corner of the irregularly-shaped project site is property owned by San Mateo County and developed with the LifeMoves Maple Street Homeless Shelter and the Maple Street Correctional Center (Photo 7). Further east of the project site and across the existing terminus of Maple Street is the Redwood City Police Department (Photo 8) and vacant City-owned property. The San Mateo County Sheriff's Correctional Center is located further east, across the Maple Street overpass. To the east of the Correction Center is a 27-acre area that is proposed for development with approximately 1 million square feet of office improvements.

(3) Areas to the South and West. South and west of the project site is US 101. Immediately south of and adjacent to the project site is the future planned extension of Blomquist Street from its current intersection with Maple Street to East Bayshore Road, as depicted in Figure III-2 in Chapter III, Project Description. Across US 101 land uses consist of commercial and retail uses and the meandering Redwood Creek. Downtown Redwood City is located approximately 1 mile to the south.

d. Regulatory Context. Planning and regulatory documents that guide land use and development on the project site include the Redwood City General Plan (General Plan) and the Redwood City Zoning Ordinance (Zoning Ordinance). Brief descriptions of these documents are provided below.

¹ The term "live-aboard vessels" generally refers to both structures located on floating barges and boats that are occupied by residents.

² Overland Pacific & Cutler, Inc., 2016. Docktown Plan. December 12.

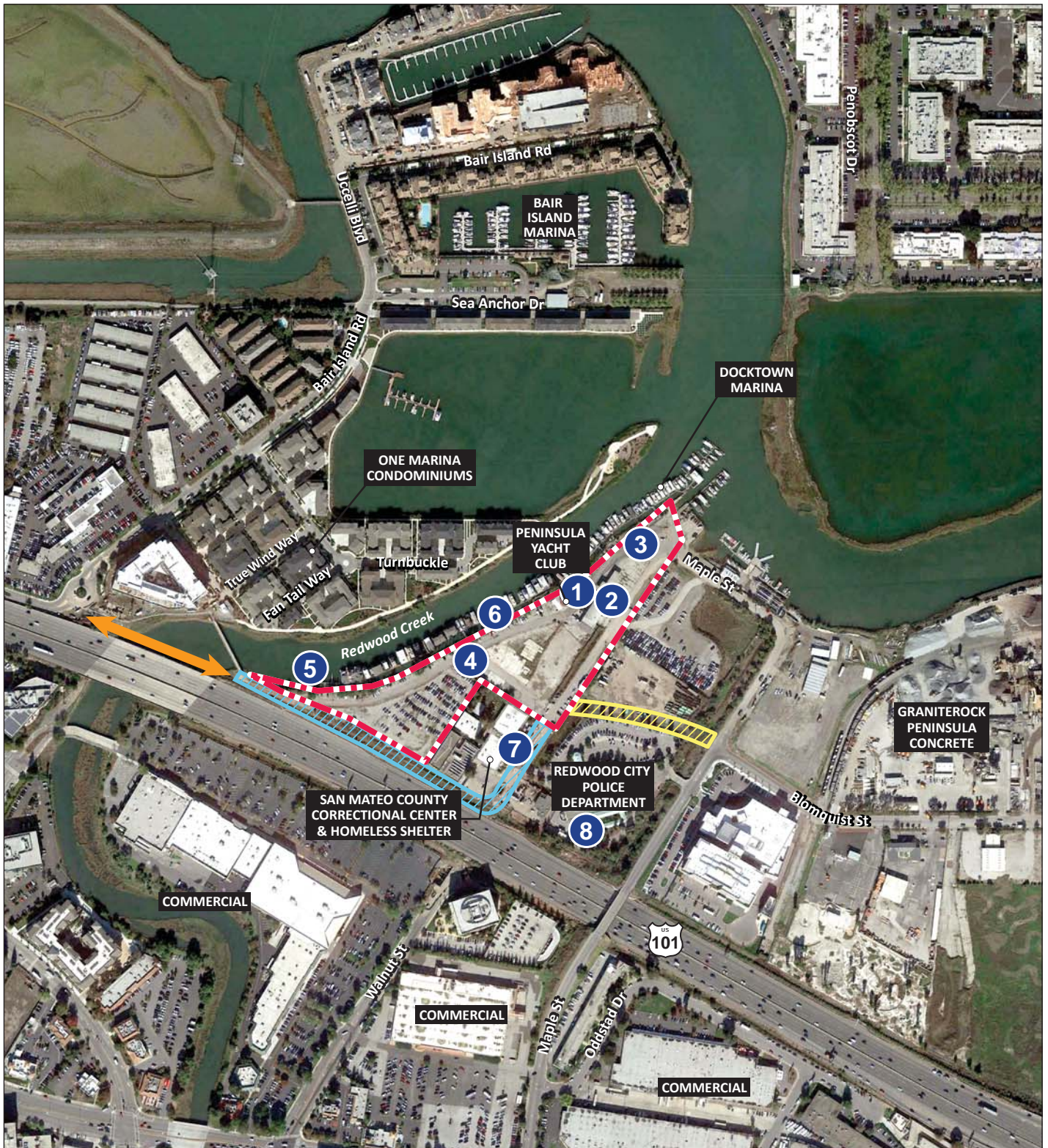
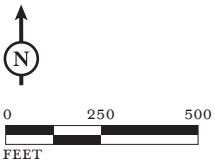


FIGURE IV.A-1

LSA



- Project Site
- Off-Site Project Impact Area
- Off-Site Project Variant Impact Area
- 3 Photo Locations
- 3 Future Blomquist Street Extension to E. Bayshore Road

1548 Maple Street Project EIR

Aerial Photograph of Project Site and Existing Conditions Photo Locations

SOURCE: STRADA, MARCH 2017.

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Photo 1: Former Water Tank/Peninsula Yacht Club



Photo 2: Existing Marina Maintenance Operations Building

LSA

FIGURE IV.A-2a



Photo 3: Docktown Marina Harbor Office



Photo 4: Surface Roadways and Parking Areas

LSA

FIGURE IV.A-2b



Photo 5: Redwood Creek



Photo 6: Docktown Marina

LSA

FIGURE IV.A-2c



Photo 7: Maple Street Correctional Center



Photo 8: Redwood City Police Department

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(1) Redwood City General Plan. The General Plan,³ adopted in October 2010, is a document for the City that establishes the basis for zoning regulations and provides guidance in the evaluation of development proposals. The General Plan is formatted into five elements that cover issues that include land use, circulation/transportation, housing, conservation, open space, noise, safety, water quality and economic development. A discussion of applicable General Plan policies is included in Table IV.A-1 at the end of this section.

The project site is currently designated Mixed Use –Waterfront Neighborhood (MU-WF) on the Redwood City General Plan Land Use Policy Map. This land use designation allows for the creation of unique neighborhoods that take advantage of Redwood City’s Bay frontage and allows a residential density of up to 40 dwelling units per area.

(1) Redwood City Zoning Ordinance. The Redwood City Zoning Ordinance (Zoning Ordinance) consists of a zoning map that delineates the boundaries of zoning designations within the City and regulations that govern the use of land and placement of buildings and improvements within the various classes of districts. The purpose of the Zoning Ordinance is to protect the health, safety, peace, morals, comfort, convenience, and general welfare of the people of Redwood City, and to serve as an instrument for the effectuation of the General Plan. The project site is currently zoned Tidal Plain (TP), and was not changed when the General Plan was updated in 2010.

The TP zone generally permits agriculture, extraction of chemicals from sea water by natural evaporation and extraction of oyster shells or other deposits from San Francisco Bay, and public parks and public recreation areas or facilities. A number of other uses are conditionally permitted in the TP zone.

2. Impacts and Mitigation Measures

The following section provides a discussion of impacts related to land use that could result from development of the proposed project. The section begins with the criteria of significance, establishing the thresholds to determine whether an impact is significant. The latter part of this section describes the land use impacts from the proposed project and recommends mitigation measures, if required.

As noted earlier, conflicts between a project and applicable policies do not constitute significant physical environmental impacts in and of themselves; as such, the proposed project’s consistency with applicable policies is discussed separately from the physical land use impacts associated with the proposed project. A policy inconsistency is considered to be a significant adverse environmental impact only when it is related to a policy adopted for the purpose of avoiding or mitigating an environmental effect, and it is anticipated that the inconsistency would result in a significant adverse *physical* impact when evaluated against the established significance criteria. The proposed project’s consistency with regional policies related to physical environmental topics (e.g., air quality, transportation, and noise) is analyzed and discussed in those topical sections of the EIR.

³ Redwood City, City of, 2010. City of Redwood City General Plan, October 11.

a. Criteria of Significance. Implementation of the proposed project would have a significant impact on land use and planning if it would:

- Physically divide an established community; or
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect or otherwise introduce new land uses that would fundamentally conflict with established uses.

b. Project Impacts. The following describes the potential impacts related to land use that could result from implementation of the proposed project.

(1) Physically Divide an Established Community. The division of an established community would typically involve the construction of a barrier to neighborhood access (such as a new freeway segment) or the removal of a means of access (such as a bridge or roadway) that would impair mobility within an existing community, or between a community and outlying areas. For example, the construction of an interstate highway through an existing community could constrain travel from one side of the community to another. Similarly, such construction could also impair travel to areas outside of the community.

The proposed project would result in redevelopment of the project site with 131 three-story for sale, market-rate townhomes. The site is bound by Maple Street to the southeast, and US 101 to the southwest, and Redwood Creek along the north. The proposed project would provide a 0.87-acre dedication of land for future development of the Blomquist Street roadway extension at the southern property line. The proposed project would include the extension of this roadway from the existing terminus of Blomquist Street at Maple Street to the newly re-constructed Maple Street immediately bordering the proposed development. The project variant would result in a further extension of the roadway to Redwood Creek.

Development of the project would not impede access to the site or to adjacent uses. Access to the site would be via Maple Street and via the Blomquist Street Extension to Maple Street with the proposed project. A third access point parallel to US 101 would be provided between proposed Buildings S and U under the project variant.

The proposed project would include construction of a 12-foot-wide paved segment of the Bay Trail within a 30-foot-wide landscaped corridor along the northern site perimeter, adjacent to Redwood Creek. Two-foot-wide shoulders would be located on both sides of the trail. The trail alignment would originate on the eastern end of the development and connect to the existing pedestrian and bicycle bridge over Redwood Creek to the west.

Access to the existing docks within Docktown Marina would be facilitated through the Bay Trail segment included as part of the proposed project. To facilitate emergency access to the docks, a temporary 4-foot-wide paved area would be located along the length of the northern property line and adjacent to the proposed Bay Trail to maintain a 20-foot-wide corridor. The 20-foot emergency access road would consist of 16 feet of pavement and 2-foot shoulders. At such time that emergency access

is no longer needed, the roadway would be converted to open space with additional tree planting, seating, and plantings.

Construction and operation of the project would generally improve access to and in the vicinity of the site, and would not limit pedestrian, bicycle or vehicular connections to the site or shoreline uses, including the docks within Docktown Marina. As a result, the impact related to dividing an established community would be considered less than significant.

(2) Land Use Policy Conflicts. The following addresses the proposed project's compatibility with the applicable land use regulations of the General Plan and Zoning Ordinance.

Redwood City General Plan. Potential conflicts with specific General Plan policies are discussed below and evaluated in detail in Table IV.A-1. Only policies adopted for the purpose of avoiding or mitigating an environmental effect and that relate directly to development of the project site are discussed. As indicated in the discussion below, the proposed project would generally be consistent with the General Plan. However, City decision-makers will evaluate the proposed project in the context of the General Plan, and as part of the development review process for the proposed project will consider potential policy conflicts. Consideration of the consistency with General Plan policies would take place independently of the environmental review process.

As shown in Table IV.A-1, the proposed project would be generally consistent with the land use and planning related policies outlined in the City's General Plan; therefore, the project would result in a less-than-significant impact related to consistency with General Plan policies adopted to mitigate adverse environmental impacts.

Table IV.A-1: Relationship of Project to Relevant Plans and Policies

| Goal/Policy/ Objective Number | Policy Summary | Project's Relationship to Policy |
|--|--|--|
| Redwood City General Plan – Built Environment Element | | |
| Policy BE-1.6 | Require that new large-scale projects are developed with an interconnected pattern of small blocks to induce walking and create walkable neighborhoods and to maximize connections between neighborhoods. If a new large-scale development project is able to achieve circulation interconnectedness for all modes and maximize walkability, then the small block pattern may not be required. | <i>Consistent.</i> The proposed project would include internal sidewalks and pathways to facilitate pedestrian and bicycle circulation throughout the site and between buildings as well as a segment of the Bay Trail, which would connect to the existing pedestrian/bicycle bridge over Redwood Creek. In addition, the project includes connections to existing roadways and construction of one or more portions of the Blomquist Street Extension, which is planned in the future to cross over Redwood Creek and connect to East Bayshore Road. |
| Policy BE-1.7 | Require that new large-scale projects consist of buildings oriented to public streets, rather than private drives, walkways, and parking lots. | <i>Consistent.</i> Due to the location of the project site near Redwood Creek, and the limited access to the area, the project includes new buildings to be aligned to access driveways and on-site roadways. |
| Policy BE-10.1 | Require that Waterfront Neighborhoods provide public access along water edges, to public open spaces and trails and to vista points, as integral parts of neighborhood development. | <i>Consistent.</i> The proposed project would construct a 12-foot-wide paved segment of the Bay Trail within a 30-foot landscaped corridor along the northern site perimeter, adjacent to Redwood Creek. |
| Policy BE-10.3 | Ensure that development in Waterfront Neighborhoods considers and plans for potential impacts associated with climate change and sea level rise. | <i>Consistent.</i> The project site would be raised 36 inches above the base flood elevation, to an elevation of 13 feet, to account for future conditions anticipated to occur with sea level rise. |
| Policy BE-10.6 | Require that development along the US 101 frontage include design elements, landscaping, and signage that create a positive aesthetic condition, as viewed from the freeway corridor. | <i>Consistent.</i> The project includes landscaping to create a positive aesthetic condition along all major streets and within the proposed segment of the Bay Trail. Under both the proposed project and the project variant, the project would include tree plantings along each segment of the Blomquist Street Extension. |

Table IV.A-1: Relationship of Project to Relevant Plans and Policies

| Goal/Policy/ Objective Number | Policy Summary | Project's Relationship to Policy |
|----------------------------------|--|--|
| Program BE-13 | <p>Shade Analysis within Mixed-Use Waterfront Neighborhood. Require all new development and redevelopment within the Mixed-Use Waterfront Neighborhood land use designation to complete a shade and shadow study unless and until implementing zoning incorporates mitigation to address impacts as defined below, unless the City's Zoning Administrator determines, based on the scale and scope of the proposed project and the criteria set forth herein, that no shade and shadow study is necessary. Significant impacts shall be mitigated to the extent feasible. The following impacts will normally be considered significant:</p> <ul style="list-style-type: none"> • Introduction of landscape that would now or in the future cast substantial shadows on existing solar collectors. • Casting of shadows that substantially impair the beneficial use of shadow-sensitive public open space. • Casting of shadows from parcels within the Mixed-Use Waterfront Neighborhood land use designation onto existing adjacent residential development that substantially impair the beneficial use of these residential parcels. • Casting of shadows that substantially impair the viability of a sensitive natural habitat. | <p><i>Consistent.</i> As part of the development process review, the Zoning Administrator would require preparation of a shadow study to ensure that the proposed project would not cast new shadows on adjacent development, public open space, or waterways. However, given the proposed project location and the low scale of the residential uses in the adjacent docks within the Docketown Marina area relative to Redwood Creek, it is not anticipated that the proposed project would cast substantial new shadows such that mitigation would be required.</p> |
| Policy BE-17.4 | <p>Facilitate a new Redwood Creek/Harbor Center that embraces Redwood Creek and the Bay, fostering an exciting waterfront destination and neighborhood with a mix of uses.</p> | <p><i>Consistent.</i> The proposed project includes residential development in an area with minimal existing residential uses and provides public connections to the waterfront.</p> |
| Policy BE-23.10 | <p>Allow development projects to exceed maximum densities if the development is within a designated planning area (such as certain precise plans) and the project demonstrates some or all of the following features that provide significant community benefits:</p> <ul style="list-style-type: none"> • Superior design and integration of a mix of uses • Incorporation of affordable housing • Incorporation of public or community facilities • Transportation demand management • Innovative use of shared parking • Efficient and innovative use of infrastructure and renewable resources • Supportive of new transit such as streetcars | <p><i>Consistent.</i> The proposed zoning for the project site, Mixed Use Waterfront District, has a maximum residential density of 40 dwelling units per acre (du/acre). The proposed density of the project is 17 du/acre. Specific community benefits are not required because the proposed project would not exceed the maximum density of development for the site; however, the proposed project would incorporate public facilities into the development, through construction of a segment of the Bay Trail along Redwood Creek.</p> |

Table IV.A-1: Relationship of Project to Relevant Plans and Policies

| Goal/Policy/ Objective Number | Policy Summary | Project's Relationship to Policy |
|----------------------------------|--|---|
| Policy BE-24.11 | Consider the impacts of global warming, such as rising sea levels and floodplain areas, when reviewing plans for new development. | <i>Consistent.</i> The project site would be raised 36 inches above the base flood elevation, to an elevation of 13 feet, to account for future conditions anticipated to occur with sea level rise. |
| Policy BE-40.6 | Support the expansion of the city's Recycled Water Service Area, and actively promote widespread use of recycled water in and around Redwood City. | <i>Consistent.</i> The project would connect to the recycled water main at the intersection of Maple Street and Blomquist Street. In order to loop the system, the recycled water main would cross through the site and connect to the existing recycled water system within the Caltrans right-of-way west of the western property line. |
| Policy PS-13.3 | Consider noise impacts as part of the development review process, particularly the location of parking, ingress/egress/loading, and refuse collection areas relative to surrounding residential development and other noise-sensitive land uses. | <i>Consistent.</i> This EIR addresses potential noise impacts resulting from construction and operation of the proposed project. Impacts were determined to be less than significant with implementation of recommended mitigation measures. |
| Program PS-23 | Seismic Safety Addressed in CEQA. Require environmental documents prepared in connection with CEQA to address seismic safety issues, and provide adequate mitigation for existing and potential hazards. | <i>Consistent.</i> The Initial Study prepared for this project addresses potential impacts related to seismic safety issues, which were determined to be less than significant with implementation of standard conditions of approval and compliance with the applicable Building Code. |
| Policy BC-1.3 | Enhance street corridors, parkways, and public property between buildings to serve as functional recreation and green space. | <i>Consistent.</i> The project would include construction of a segment of the Bay Trail with public access to the waterfront and landscaping within the project site and along proposed roadways to serve as functional recreation and green space. |

Source: *Redwood City General Plan*, October 2010.

Redwood City Zoning Ordinance. The project site is located within the Tidal Plain (TP) zoning designation, which does not allow for development. The TP zoning designation was not changed when the General Plan was updated, and the project applicant is requesting that the project site be rezoned to a new zoning designation, Mixed Use Waterfront, to allow development of the proposed residential use as part of the project. The text of the Zoning Ordinance would be amended to include the description of the new designation, as described in Chapter III, Project Description. As discussed below, development of residential uses within the project site would not be incompatible with existing uses in the vicinity of the project site. Following amendments to the zoning ordinance, the project would result in a less-than-significant impact related to consistency with the Zoning Ordinance.

Land Use Compatibility. As discussed above, under Existing Land Uses in the Vicinity of the Project Site, the site is surrounded by the docks within Docketown Marina and Redwood Creek to the north, LifeMoves Maple Street Homeless Shelter, the Maple Street Correctional Center, vacant storage and the Redwood City Police Station to the east, and US 101 to the south and west.

The project would result in the construction of 131 market-rate townhomes, as well as associated open space, circulation and parking, infrastructure, soil remediation, and grading improvements. The project would be directly adjacent to the existing docks within the Downtown Marina which currently consist of both live-aboard and non-live-aboard vessels. As discussed above, the proposed project would construct a 12-foot-wide segment of the Bay Trail along the northern perimeter of the site, adjacent to Redwood Creek and a temporary emergency access road to facilitate access to the docks within Docketown Marina and other adjacent uses.

While the proposed project would introduce new land uses into the project site, it would not result in land use conflicts with surrounding uses. Residential land uses on the site would be consistent with the patterns of development located immediately across Redwood Creek, in particular. Impacts associated with land use compatibility would therefore be less than significant.

c. Cumulative Impacts. The cumulative geographic context for land use, plan, and policy considerations for development consists of the project site in addition to the surrounding areas and uses abutting the project site.

The area surrounding the project site is largely developed with a mix of residential, industrial, public, infrastructure, and Port-related uses. Development of the project would increase the intensity of residential development within the vicinity of the project site; however, other development projects are dispersed geographically throughout the City such that they would not combine with the project to result in cumulative impacts related to physical division of an established community.

In addition, all other cumulative development has been, or will be, subject to development guidance contained within the General Plan, prescribed by zoning, and other applicable land use plans to avoid conflicting with plans adopted to avoid or mitigate environmental effects. Based on the information in this land use section and for the reasons summarized above, development of the project would not contribute to any significant adverse cumulative land use impacts when considered together with other cumulative development.

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B. BIOLOGICAL RESOURCES

This section describes the existing biological resources on and in the vicinity of the proposed project site, including potentially occurring special-status species and/or species of special concern and sensitive habitats, such as wetlands. Potential impacts to biological resources associated with implementation of the proposed project and the project variant are described, and mitigation measures are identified, where required. The analysis contained in the Initial Study (Appendix B) determined that the proposed project would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or State habitat conservation plan and this topic is not further discussed in this section.

1. Setting

This subsection describes: 1) the methods used to establish the baseline conditions for biological resources in the project area; 2) the regulatory context related to biological resources; and 3) existing biological resources occurring within and in the vicinity of the project site.

a. Methods. LSA biologists reviewed project-related background reports and other available documentation prepared for the site submitted as part of the project application materials, including but not limited to project plans produced by BKF Engineers, dated March 28, 2017, the Draft Wetland Delineation Report prepared by Wetland Research Associates (WRA),¹ and the Tree Inventory prepared by Matthew Fried.²

LSA performed a spatial query of the California Natural Diversity Database (CNDDDB)³ to obtain records of special-status plant and animal species within 5 miles of the project site using Geographic Information System (GIS) software (Esri ArcGIS 10.4.1). LSA also reviewed current and historical Google Earth⁴ aerial images of the site as well as the U.S. Geological Survey (USGS) 7.5 minute Palo Alto Quadrangle Map.

An LSA biologist visited the site on June 8, 2017, to assess current conditions and evaluate whether habitat existed on the site with the potential to support special-status plant and animal species. The biologist walked meandering transects through the property. The transects were spaced sufficiently close together to allow for 100 percent visual coverage of the ground surface, so that any sign of wildlife (e.g., burrows, dens, scat, tracks) would be detected. The biologist also inspected the southern shoreline of Redwood Creek and a ditch along Maple Street. Binoculars were used to look for evidence of bat roosts and bird nests in trees. The biologist looked under boards and other debris on the site for small animals. All plant and wildlife species that could be identified were recorded in a

¹ Wetland Research Associates, 2017. *Draft Delineation of Potential Jurisdictional Waters of the U.S. under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act, 1548 Maple Street, Redwood City, San Mateo County, California*. August.

² Matthew Fried, 2017. ISA Certified Arborist MA-4851A. Tree Inventory 1548 Maple St.

³ California Department of Fish and Wildlife, 2017a. California Natural Diversity Database, RareFind 5 Commercial Version, February 9, 2017. California Department of Fish and Wildlife, Biogeographic Data Branch, Sacramento.

⁴ Google Earth, 2017. Aerial imagery for 1548 Maple Street, Redwood City, California, and surrounding area, Website: earth.google.com/web/@37.49487301,-122.22139824,1.66631033a,1151.79958223d,35y,0h,0t,0r (accessed June 2017).

field notebook. Several photographs were taken to document conditions on the site. No protocol-level rare plant surveys or focused wildlife surveys were conducted as part of this site evaluation.

For the purposes of this analysis, 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 federal Endangered Species Act (ESA);
- 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 to California Rare Plant Ranks 1A, 1B, 2A, and 2B;
- Animal species designated as Species of Special Concern or Fully Protected by the California Department of Fish and Wildlife (CDFW);
- Species that meet the definition of rare, threatened, or endangered under Section 15380 of the CEQA guidelines; or
- Species considered to be a taxon of special concern by local agencies.

b. Existing Conditions. The majority of the project site previously consisted of tidal wetlands that were filled and drained for upland uses. Most of the site is paved, and much of it is used for outdoor storage of new automobiles. The following subsection describes the existing land cover/vegetation types and wildlife habitats present on the site, as well as potentially occurring special-status plant and animal species, sensitive vegetation types, and jurisdictional waters/features. Generally, conditions within the off-site areas that could be developed by the project variant, which consist of an additional 0.36 acres of land, are similar to the project site, unless otherwise noted.

(1) Land Cover and Vegetation Communities. Land cover on the project site includes non-vegetated barren/paved areas, open water (lotic), and the following vegetation communities: landscaped, ruderal, and wetlands, which are further described below.

Barren/Landscaped/Developed. The majority of the site is developed and paved. A row of ornamental trees including eucalyptus, Norfolk Island pine (*Araucaria heterophylla*), and palms runs parallel to Redwood Creek and the vessels located within the marina. Smaller ornamental plants include bottlebrush plant (*Callistemon* sp.) and Nopal or prickly pear cactus (*Opuntia* sp.).

Ruderal. Small patches of ruderal vegetation grow along the edges of the parking lots and US 101. Common weedy plants such as fennel (*Foeniculum vulgare*), knotweed (*Polygonum arenastrum*), and coyote brush (*Baccharis pilularis*) grow along the edges of the pavement and through cracks.

Wetlands. As detailed in the Draft Wetland Delineation Report,⁵ a drainage ditch (Wetland Ditch 1) is located on the southeast side of Maple Street adjacent to the City of Redwood City Police Department and consists of a freshwater emergent wetland. On the northwest side of Maple Street, an approximately 315-foot-long, 10-foot-wide drainage ditch (Wetland Ditch 2) consists of a freshwater emergent wetland. Small, isolated patches of pickleweed (*Salicornia* sp.) are present in Wetland

⁵ Wetland Research Associates, 2017, op. cit.

Ditch 2, and willows (*Salix* sp.) are present as well. Wetland Ditch 3 is located in the area of the project variant on the western edge of the eastern portion of Maple Street. Emergent plants in Wetland Ditch 3 include cattails (*Typha latifolia*). All of the wetlands are degraded and contain large amounts of litter and debris.

The planted ornamental trees along the Docketown Marina docks on Redwood Creek are not considered riparian vegetation.

Lotic. Redwood Creek is tidally influenced at the project site. Redwood Creek is tributary to Steinberger Slough past the north end of the project site. The banks of Redwood Creek are very steep, limiting the area in the intertidal zone. Portions of the bank are lined with riprap made from old chunks of concrete.

(2) Wildlife and Habitats. The following birds were observed on the site: mourning dove (*Zenaidura macroura*), Eurasian collared dove (*Streptopelia decaocto*), California towhee (*Melospiza crissalis*), American crow (*Corvus brachyrhynchos*), Anna's hummingbird (*Calypte anna*), house finch (*Haemorhous mexicanus*), gulls (*Larus* sp.), and black phoebe (*Sayornis nigricans*). It is likely that many more species of native migratory birds use the site for foraging and nesting. Eurasian collared doves were observed on an active nest on a building in the project area.

Additionally, people were seen walking pet dogs (*Canis familiaris*) on leash. Pet and/or feral cats (*Felis catus*) are also present on the site. A structure that appeared to be a feral cat feeding station is located off site near the southern leg of Maple Street. No other mammals were seen. Numerous bait stations for rodenticide were seen throughout the project site, indicating that human-commensal rodents (e.g., house mouse [*Mus musculus*], Norway rats [*Rattus norvegicus*], and/or roof rats [*Rattus rattus*]) are present. Other urban-adapted species that likely occur on the site include raccoons (*Procyon lotor*) and Virginia opossums (*Didelphis virginiana*).

No reptiles, amphibians, or fish were seen on the site or in Redwood Creek. No evidence of bats such as staining or guano was seen on any buildings or trees.

(3) Special-Status Natural Communities. The CDFW tracks the occurrences of natural plant communities that are of limited distribution Statewide or within a county or region and are often vulnerable to environmental effects of development. Many special-status natural communities support special-status plants and animals and are addressed under CEQA as habitat for those species. The CNDDDB contains occurrences for Serpentine Bunchgrass, Northern Coastal Salt Marsh, and Valley Oak Woodland within 5 miles of the site. None of these special-status natural communities are present on the proposed project site or the proposed project variant site.

(4) Special-Status Plant Species. The CNDDDB⁶ produced a list of 22 special-status plant species with occurrences within 5 miles of the site. These species are identified in Table IV.B-1. Table IV.B-1 also includes the regulatory status and habitat, blooming period, and discussion about the potential for each species to occur on the site. None of these plant species were detected during the June 8, 2017 site visit, or during the wetland delineation conducted on April 19 and August 4, 2017. Due to the development of the site and lack of habitats, none of the special-status plant species are expected to occur within the project site.

⁶ California Department of Fish and Wildlife, 2017a, op. cit.

Table IV.B-1: Special-Status Plant Species With CNDDDB Occurrences Within 5 Miles of the Project Site

| Species | Status* (Federal/ State/RPR) | Habitat Requirements | Blooming Period | Potential for Occurrence |
|--|------------------------------------|---|-----------------------------|---|
| <i>Acanthomintha duttonii</i> San Mateo thorn-mint | FE/SE/1B | Serpentine soils with inclusions of heavy clay in relatively open areas within grassland and chaparral. Known only from San Mateo County, California. Elevation: 50-300 meters. | April-June (annual herb) | No potential to occur due to absence of habitat on site. Project site is outside of the known elevation range of the species. |
| <i>Allium peninsulare</i> var. <i>franciscanum</i> Franciscan onion | -/-/1B | Cismontane woodland, valley and foothill grassland. Clay soils; often on serpentine. Dry hillsides. Elevation: 100-300 meters. | May-June | No potential to occur due to absence of habitat on site. Project site is outside of the known elevation range of the species. |
| <i>Arctostaphylos regismontana</i> Kings Mountain manzanita | -/-/1B | Granitic or sandstone, Broadleaved upland forest, chaparral, North Coast coniferous forest. Elevation: 305-730 meters. | January-April | No potential to occur due to absence of habitat on site. Project site is outside of the known elevation range for the species. |
| <i>Collinsia multicolor</i> San Francisco collinsia | -/-/1B | Sometimes serpentinite, closed-cone coniferous forest, and coastal scrub. Elevation: 30-250 meters. | February-May | No potential to occur due to absence of habitat on site. Project site is outside of the known elevation range of the species. |
| <i>Centromadia parryi</i> ssp. <i>congdonii</i> Congdon's tarplant | -/-/1B | Valley and foothill grassland (alkaline). Elevation: 0-230 meters. | May-October | No potential to occur due to absence of alkaline grassland habitat on site. |
| <i>Chloropyron maritimum</i> subsp. <i>palustre</i> Point Reyes bird's-beak | -/-/1B | Coastal salt marsh. Elevation: 0-15 meters. | June-October | No potential to occur due to absence of salt marsh habitat. |
| <i>Cirsium fontinale</i> var. <i>fontinale</i> Crystal Springs fountain thistle | FE/SE/1B | Known only from serpentinite seeps in the vicinity of Crystal Springs Reservoir. Chaparral (openings), cismontane woodland, meadows and seeps, valley and foothill grassland. Elevation: 45-175 meters. | April/May- October | No potential to occur due to absence of habitat on site. Outside the known range of the variety. |
| <i>Cirsium praeteriens</i> Lost thistle | -/-/1A | Unknown. | June-July | No potential to occur because the species is presumed extinct. The CNDDDB contains only one occurrence for the species within 5 miles of the project. Only sources of information for this site are collections made in 1897 and 1901. This species was determined to be rare after it apparently went extinct. |

Table IV.B-1: Special-Status Plant Species With CNDDDB Occurrences Within 5 Miles of the Project Site

| Species | Status* (Federal/ State/RPR) | Habitat Requirements | Blooming Period | Potential for Occurrence |
|---|------------------------------------|---|------------------------|--|
| <i>Collinsia corymbosa</i> Round-headed Chinese-houses | -/-/1B | Coastal dunes. Elevation: 0-20 meters. | April-June | No potential to occur. The CNDDDB contains only one occurrence for the species within 5 miles of the project, which is based on a collection made in 1893. The site has been developed and the population is extirpated. No coastal dune habitat is present on the project site. |
| <i>Collinsia multicolor</i> San Francisco collinsia | -/-/1B | Sometimes serpentinite. Closed-cone coniferous forest, coastal scrub. Elevation: 30-250 meters. | February/March -May | No potential to occur, due to absence of habitat on site. Project site is outside of the known elevation range for the species. |
| <i>Dirca occidentalis</i> Western leatherwood | -/-/1B | Mesic soils in broad-leaved upland forest, chaparral, closed-cone coniferous forest, cismontane woodland, North Coast coniferous forest, riparian forest, and riparian woodland. Elevation: 30-550 meters. | January-April | No potential to occur. Suitable habitat not present. |
| <i>Eryngium aristulatum</i> var. <i>hooveri</i> Hoover's button-celery | -/-/1B | Vernal pools. Elevation: 3-45 meters. | June-August | No potential to occur, due to absence of vernal pools on the project site. |
| <i>Fritillaria liliacea</i> Fragrant fritillary | -/-/1B | Cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland. Elevation: 3-410 meters. | February- April | No potential to occur. Suitable habitat not present. The nearest known occurrences are predominately in serpentine soils in undeveloped coastal prairie, which is not present on the project site. |
| <i>Hesperolinon congestum</i> Marin western flax | FT/ST/1B | Serpentinite in chaparral, valley and foothill grassland. Elevation: 30-365 meters. | April-July | No potential to occur. Suitable serpentine habitat not present. |
| <i>Lessingia arachnoidea</i> Crystal Springs lessingia | -/-/1B | Serpentinite, often roadsides. Cismontane woodland, coastal scrub, valley and foothill grassland. Known only from near Crystal Springs Reservoir. Elevation: 60-200 meters. | July-October | No potential to occur due to absence of habitat on site. Project site is outside of the known elevation range for the species. |
| <i>Malacothamnus arcuatus</i> Arcuate bush-mallow | -/-/1B | Chaparral, cismontane woodland. Elevation: 15-355 meters. | April- September | No potential to occur due to absence of habitat on site. Project site is outside of the known elevation range for the species. |
| <i>Monolopia gracilens</i> Woodland woollythreads | -/-/1B | Mixed evergreen forest, redwood forest, chaparral Affinity to serpentine soil. Elevation: 100-1,200 meters. | March-July | No potential to occur due to absence of habitat on site. Project site is outside of the known elevation range for the species. |

Table IV.B-1: Special-Status Plant Species With CNDDDB Occurrences Within 5 Miles of the Project Site

| Species | Status* (Federal/ State/RPR) | Habitat Requirements | Blooming Period | Potential for Occurrence |
|---|------------------------------------|---|--------------------|--|
| <i>Pentachaeta bellidiflora</i> White-rayed pentachaeta | FE/SE/1B | Cismontane woodland, valley and foothill grassland (often serpentinite). Elevation: 35-620 meters. | March-May | No potential to occur due to absence of habitat on site. Project site is outside of the known elevation range for the species. |
| <i>Silene verecunda</i> ssp. <i>verecunda</i> San Francisco campion | -/-/1B | Sandy. Coastal bluff scrub, chaparral, coastal prairie, coastal scrub, valley and foothill grassland. Elevation: 30-645 meters. | March-June | No potential to occur. There is only one CNDDDB occurrence within 5 miles of the project site, based on observations made in serpentine grassland in Edgewood County Park. Project site is outside of the known elevation range for the species. |
| <i>Stuckenia filiformis</i> ssp. <i>alpina</i> Slender-leaved pondweed | -/-/2B | Marshes and swamps; shallow, clear water of lakes and drainage channels. Elevation: 300-2,150 meters. | N/A | No potential to occur due to absence of habitat on site. Project site is outside of the known elevation range for the species. |
| <i>Trifolium hydrophilum</i> Saline clover | -/-/1B | Seasonally wet alkaline marshes; vernal pools; in valley and foothill grassland. Elevation: 0-300 meters. | April-June | No potential to occur. There are no vernal pools or marshes on the project site. |
| <i>Triphysaria floribunda</i> San Francisco owl's-clover | -/-/1B | Usually found on serpentinite in coastal prairie, coastal scrub, or valley and foothill grassland. Elevation: 10-160 meters. | April-June | No potential to occur. The CNDDDB contains only one occurrence within 5 miles of the site, and it is extirpated. |

* Status:

FE = federally endangered

FT = federally threatened

SE = State endangered

ST = State threatened

SR = State rare

1A = Rare Plant Rank (RPR) 1A: Species presumed extirpated in California and either rare or extinct elsewhere.

1B = California Rare Plant Rank 1B: Species considered rare or endangered in California and elsewhere.

2B = California Rare Plant Rank 2B: Species presumed extirpated in California, but common elsewhere.

Source: LSA, 2017.

(5) **Special-Status Wildlife Species.** The CNDDDB⁷ produced a list of 21 special-status animal species with occurrences within 5 miles of the site. These species are identified in Table IV.B-2. Table IV.B-2 also includes the regulatory status and habitat, and discussion about the potential for each species to occur on the site. For bird species, the potential to occur only describes the potential to nest on or adjacent to the site. Several special-status bird species may fly over the site.

Based on a review of the 21 animal species' habitat requirements, the existing conditions on the site, and connections or barriers to other populations, it was determined that only two of the 21 special-status animal species shown in Table 2 could occur on the project site: white-tailed kite and longfin smelt.

The potential to occur is defined as follows:

- *No Potential.* The site is clearly unsuitable for the species' requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).
- *Low Potential.* Few of the habitat components meeting the species' requirements are present and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.
- *Moderate Potential.* Some of the components meeting the species' habitat requirements are present and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.
- *High Potential.* All of the components meeting the species' habitat requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.
- *Present.* The species is observed on the site or has been recorded (e.g., CNDDDB, other confirmed reports) on the site recently (within the last 5 years).

White-tailed Kite. The white-tailed kite is not listed under ESA or CESA; however, it is designated as a state Fully Protected species (California Department of Fish and Game Code Section 3511). Although the white-tailed kite is not listed as federally threatened or endangered it is also protected under the federal Migratory Bird Treaty Act.

This species nests in trees or large shrubs with dense foliage located near suitable foraging areas (e.g., grasslands, marshes, agricultural fields). Preferred prey items include California voles and mice. Confirmed observations of white-tailed kite nests have been made in Redwood City.⁸ Although no white-tailed kites were observed on the site during the survey and the potential for the species to occupy the site is low, white-tailed kite could nest in the trees on the site given that the numerous trees provide suitable nest sites, and potentially suitable foraging habitat is available in nearby off-site marshes.

⁷ Ibid.

⁸ Sequoia Audubon Society, 2001. *San Mateo County Breeding Bird Atlas*.

Longfin Smelt. The longfin smelt (San Francisco Bay-Delta Distinct Population Segment ([Bay-Delta DPS])) was federally listed as a candidate species on April 2, 2012 (77 FR 19756). The longfin smelt was listed as a threatened species under CESA in 2009 (14 CCR 670.5).

Longfin smelt is a pelagic fish, which in the Bay-Delta refers to organisms that occur in open water away from the bottom of the water column and away from the shore. This species is short-lived, usually dying after two years with some individuals surviving three years.⁹ Longfin smelt in the Bay-Delta may spawn as early as November and as late as June, although spawning typically occurs from January to April.¹⁰ Fish migrate into freshwater areas of the Bay-Delta region to spawn. It is thought that longfin smelt are restricted to water temperatures below approximately 71 degrees Fahrenheit, and fish move downstream into the estuary during the summer months when waters in the Delta are too warm. Longfin smelt are an anadromous species, although migration patterns from coastal waters to the estuary are poorly understood.

Longfin smelt were caught in South San Francisco Bay in 2012 and 2013.¹¹ The species was not detected during surveys in 2014 and 2015, the last year for which data are available. During surveys conducted by the Marine Science Institute from 2014 through 2016, one longfin smelt was caught in the South San Francisco Bay.¹²

There is a low potential for longfin smelt to be in open water in Redwood Creek during construction of the project. December through March would be the most likely time when they would be in waters adjacent to the site as this is the period when they may go up Redwood Creek in an attempt to spawn.

⁹ Moyle, P.B., 2002. *Inland fishes of California: revised and expanded*. University of California Press, Berkeley.

¹⁰ Ibid.

¹¹ California Department of Fish and Wildlife, 2017b. Fish Distribution Map. Website: www.dfg.ca.gov/delta/data/BayStudy/CPUE_Map.asp (accessed October 20, 2017).

¹² Peluso-Galaviz, K., 2017. Head of Program Department, Marine Science Institute. Personal communication with LSA Associates, Inc. October 3.

Table IV.B-2: Special-Status Animal Species With CNDDDB Occurrences Within 5 Miles of the Project Site

| Species | Status* (Federal/State/CDFW) | Habitat Requirements | Potential for Occurrence |
|--|---------------------------------|--|---|
| Invertebrates | | | |
| Bay checkerspot butterfly <i>Euphydryas editha bayensis</i> | FT/-/- | The primary host plant for larvae is dwarf plantain. As the plantain dries up the larvae move to purple owl's clover. Adults feed on the nectar of these plants, which grow on shallow, serpentine-derived soils. | No potential to occur. No suitable habitat or host plants on the site. |
| Fish | | | |
| Longfin smelt <i>Spirinchus thaleichthys</i> | FC ¹³ /ST/CSC | Spends its adult life in bays, estuaries, and nearshore coastal areas, and migrates into freshwater rivers and tidally influenced freshwater tributaries to spawn. Likely attach their eggs to sandy substrates. | Low potential to occur. Low numbers of the species were observed in the South San Francisco Bay in 2012 and 2013. There are no suitable tidally influenced freshwater tributaries upstream of the project site, because Redwood Creek is channelized and culverted. |
| Tidewater goby <i>Eucyclogobius newberryi</i> | FE/-/CSC | Lower reaches of coastal streams, typically in freshwater estuaries behind seasonal barrier beaches. The open estuaries of relatively large streams or rivers (e.g., Redwood Creek) do not generally provide suitable habitat. This California endemic may be extirpated from the San Francisco Estuary. | No potential to occur, due to lack of freshwater detained behind seasonal barrier beaches. |
| Amphibians | | | |
| California red-legged frog <i>Rana draytonii</i> | FT/-/CSC | Ponds, streams, drainages and associated uplands; requires areas of deep, still, and/or slow-moving water for breeding. | No potential to occur. No breeding habitat on the site. Salt water and extensive residential and commercial development form total barriers to dispersal between the site and known populations. |
| California giant salamander <i>Dicamptodon ensatus</i> | -/-/CSC | Mesic coastal forests. Cold permanent or semi-permanent streams are required for breeding and larval development. | No potential to occur. There is only one CNDDDB occurrence within 5 miles, and it is based on an observation made in 1935 in Woodside. Suitable forest and creek habitat not present. |

¹³ The federal Candidate status is for the San Francisco Bay-Delta Distinct Population Segment.

Table IV.B-2: Special-Status Animal Species With CNDDDB Occurrences Within 5 Miles of the Project Site

| Species | Status* (Federal/State/CDFW) | Habitat Requirements | Potential for Occurrence |
|---|---------------------------------|--|---|
| California tiger salamander <i>Ambystoma californiense</i> | FT/ST/- | Breeds in seasonal pools and stock ponds. Spends most of its life underground in small mammal burrow complexes in upland grasslands adjacent to aquatic breeding habitat. | No potential to occur. The CNDDDB lists only one presumed extant occurrence within 5 miles of the site. It is approximately 4.22 miles from the site. The USFWS considers contiguous uplands with burrows within 1.24 miles of breeding habitat to be potential habitat. The site is isolated from all known or potential breeding habitat by salt water, extensive residential development, and/or major roads. No potential to occur due to lack of potential aquatic breeding habitat either on or adjacent to the site. |
| Reptiles | | | |
| Western pond turtle <i>Emys marmorata</i> | -/-/CSC | Ponds, streams, drainages, and associated uplands. | No potential to occur. Although western pond turtles are occasionally found in brackish waters, Redwood Creek is likely too cold and salty at the site. No suitable upland nesting habitat is present on the site. |
| San Francisco gartersnake <i>Thamnophis sirtalis tetrataenia</i> | FE/SE/CFP | Freshwater wetlands with vegetation for cover, open space for basking and nearby upland areas for shelter during winter. Requires abundant frogs for prey. | No potential to occur due to lack of extensive freshwater wetlands with frog populations on site. |
| Birds | | | |
| White-tailed kite <i>Elanus leucurus</i> | -/-/CFP | Open grasslands, meadows, or marshes. Requires dense-topped trees or shrubs for nesting and perching. Nests in shorter coyote brush shrubs on islands that do not have terrestrial nest predators. | Low potential to occur. Trees on site and nearby provide suitable nest sites. Some nearby off-site marshes may provide suitable foraging habitat. However, the high level of human activity and urban-adapted nest predators such as rats and raccoons on the site limits the potential for the species to nest on the site. |
| American peregrine falcon <i>Falco peregrinus anatum</i> | -/-/CFP | Nests on cliffs, tall buildings, and occasionally towers. | No potential to occur. Suitable nest sites such as tall buildings or towers are not present on the site. There is only one CNDDDB occurrence within 5 miles of the site, which is associated with a pair nesting on a tall office building on the Oracle campus. Has also been observed nesting on a PG&E electrical transmission tower on Bair Island, approximately 2.5 miles north of the site. |

Table IV.B-2: Special-Status Animal Species With CNDDDB Occurrences Within 5 Miles of the Project Site

| Species | Status* (Federal/State/CDFW) | Habitat Requirements | Potential for Occurrence |
|--|---------------------------------|---|--|
| California black rail <i>Laterallus jamaicensis coturniculus</i> | -/ST/CFP | Salt marshes bordering larger bays; also found in brackish and freshwater marshes. | No potential to occur. Suitable salt marsh habitat not present on the site. There is only one CNDDDB occurrence within 5 miles of the site, which is based on a nest observed in 1977 near Belmont Slough. |
| Ridgway's rail <i>Rallus obsoletus</i> (formerly known as California clapper rail <i>Rallus longirostris obsoletus</i>) | FE/SE/CFP | Tidal salt marshes with sloughs and substantial cordgrass (<i>Spartina</i> sp.) cover. | No potential to occur. No large expanses of cordgrass are present on the site. |
| California least tern <i>Sternula antillarum browni</i> | FE/SE/CFP | Sandy beaches, alkali flats, hard-pan surfaces (salt ponds). | No potential to occur. Suitable nesting habitats such as beaches are not present on the site. The presence of cats, dogs, and other urban-adapted nest predators further limits the possibility for occurrence. |
| Western snowy plover (Pacific coast population) <i>Charadrius alexandrinus nivosus</i> | FT-/CSC | Sandy beaches, salt ponds, and salt pond levees. | No potential to occur. There are four CNDDDB occurrences within 5 miles of the site, one of which is possibly extirpated. No suitable habitat present on the site. |
| Short-eared owl <i>Asio flammeus</i> | -/-/CSC | Nests on the ground in marshes, grasslands, and old pastures. | No potential to occur. There is only one CNDDDB occurrence within 5 miles of the site, based on nests on Bair Island. No suitable nesting or foraging habitat on site. |
| Alameda song sparrow <i>Melospiza melodia pusillula</i> | -/-/CSC | Tidal and muted salt marshes on the fringes of South San Francisco Bay. Forages on bare ground and in sparse vegetation in tidal salt marshes. Nests in taller plants, such as coyote brush and gumplant, which provide cover from predators. | No potential to occur. The site lacks marsh habitat. Pet cats and dogs on the site would further deter any attempted nesting. |
| Mammals | | | |
| American badger <i>Taxidea taxus</i> | -/-/CSC | Open grasslands with friable soils. | No potential to occur. No open grasslands habitat on the site. |
| Pallid bat <i>Antrozous pallidus</i> | -/-/CSC | Roosts in caves, tunnels, buildings, under bridges, and in tree hollows; forages in a variety of habitats. | No potential to occur. There are three CNDDDB occurrences within 5 miles of the site. No large hollows or cavities were observed in on-site trees. Dispersing or migrating individuals may occasionally fly over site for brief periods, but extended use and roosting not expected. |

Table IV.B-2: Special-Status Animal Species With CNDDDB Occurrences Within 5 Miles of the Project Site

| Species | Status* (Federal/State/CDFW) | Habitat Requirements | Potential for Occurrence |
|---|---------------------------------|--|---|
| Salt marsh harvest mouse <i>Reithrodontomys raviventris</i> | FE/SE/CFP | Tidal salt marshes of San Francisco Bay and its tributaries. Requires large stands of tall, dense pickleweed for cover. | No potential to occur. Only very small patches of pickleweed are present on the site. |
| Salt-marsh wandering shrew <i>Sorex vagrans halicoetes</i> | -/-/CSC | Inhabits the intertidal zone where pickleweed grows. Tidal salt marshes with abundant driftwood and other debris for shelter and foraging. | No potential to occur. Only very small patches of pickleweed are present on the site. |
| San Francisco dusky-footed woodrat <i>Neotoma fuscipes annectens</i> | -/-/CSC | Chaparral and woodlands. Feeds mainly on woody plants. An agile climber that builds stick houses in trees and on the ground. | No potential to occur. No woodrat houses or habitat are present on the site. |

*Status:

FE = federally endangered

FT = federally threatened

FC = federal candidate

SE = State endangered

ST = State threatened

CSC = California Species of Special Concern

CFP = California Fully Protected Species

Source: LSA, 2017.

c. Regulatory Framework. Biological resources on the site may fall under the jurisdiction and regulations of the agencies listed below.

(1) United States Fish and Wildlife Service. The U.S. Fish and Wildlife Service (USFWS) has jurisdiction over federally listed threatened and endangered species under the federal ESA. The ESA protects listed species from harm or “take” which is broadly defined as to “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct.” An activity can be defined as a “take” even if it is unintentional or accidental.

An endangered species is one which is in danger of becoming extinct throughout all or a significant portion of its range. A threatened species is one that is likely to become endangered within the foreseeable future. In addition to endangered and threatened species, which are legally protected under the federal ESA, the USFWS maintains a list of candidate species. Candidate species are specifically included on a list published in the federal register. Federal candidate species are not afforded legal protection under the federal ESA.

(2) California Department of Fish and Wildlife. The CDFW has jurisdiction over State-listed threatened, endangered, and rare (plant) species under the CESA. In addition, species proposed for listing under the CESA are also protected until a determination is made on the listing proposal. The State and federal lists are generally similar, although a few species present on one list may be absent from the other list. The State also maintains lists of special-status wildlife species identified as Species of Special Concern. These are species whose status is being monitored due to one or more threats. Species on these lists are not afforded legal protection.

The CDFW also exerts jurisdiction over the bed and bank of watercourses according to the provisions of Section 1601 to 1603 of the Fish and Game Code. The CDFW typically requires a Streambed Alteration Agreement for the fill or removal of material from any natural drainage. The jurisdiction of the CDFW under Section 1600 of the Fish and Game Code extends to the top of bank of a stream.

(3) U.S. Army Corps of Engineers. Under Section 404 of the Clean Water Act, the U.S. Army Corps of Engineers (Corps) is responsible for regulating the discharge of fill material into waters of the United States. Waters of the U.S. and their lateral limits are defined in 33 Code of Federal Regulations (CFR) Part 328.3 (a) and include streams that are tributary to navigable waters and their adjacent wetlands. Wetlands that are not adjacent to waters of the U.S. are termed “isolated wetlands” and may be subject to Corps jurisdiction.

In general, a Corps permit must be obtained before placing fill in wetlands or other waters of the U.S. The type of permit depends on the acreage involved and the purpose of the proposed fill. Nationwide Permits are available for projects that are anticipated to have minimal impacts on waters of the U.S. and wetlands and meet the general terms of the specific Nationwide Permit and the standard conditions for all Nationwide Permits. An Individual Permit is required for projects that result in more than a “minimal” impact on wetlands. The Corps would be required to consult with the USFWS under Section 7 of the Endangered Species Act if a project subject to Clean Water Act permitting will result in take of a federally listed species. For take of federally listed or candidate anadromous fish species such as the longfin smelt, the Corps will be required to consult with the National Oceanic and Atmospheric Administration, Fisheries (NOAA Fisheries). The Corps must also consult with the National Marine Fisheries Service (NMFS) regarding impacts to Essential Fish Habitat (EFH), which

is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity." The Corps must also consult with the Regional Water Quality Control Board (Regional Water Board) regarding potential impacts to water quality. The Corps must also consult with the San Francisco Bay Conservation and Development Commission (BCDC) prior to the BCDC issuing a permit.

(4) National Oceanic and Atmospheric Administration Fisheries. Like the USFWS, NOAA Fisheries has jurisdiction over federally listed threatened and endangered species under the federal Endangered Species Act. The NOAA Fisheries jurisdiction is restricted to marine and anadromous wildlife species such as salmon and steelhead. NOAA Fisheries is also consulted by other federal agencies (e.g., the Corps) that issue permits for activities that may adversely affect EFH.

NOAA Fisheries would provide the federal action agency with EFH Conservation Recommendations. These Conservation Recommendations would provide information on how to avoid, minimize, mitigate, or offset adverse effects to EFH.

(5) Regional Water Quality Control Board. Pursuant to Section 401 of the Clean Water Act, projects that require a permit from the Corps under Section 404 must also obtain water quality certification from the Regional Water Board. This certification ensures that the project will uphold State water quality standards. The Regional Water Board requires mitigation for any loss of jurisdictional area.

(6) CEQA Guidelines Section 15380. Although threatened and endangered species are protected by specific federal and State statutes, CEQA Guidelines Section 15380(b) provides that a species not listed on the federal or State list of endangered or threatened species may be considered rare or endangered if the species can be shown to meet certain, specified criteria. These criteria have been modeled after the definition in the federal ESA and the section of the California Fish and Game Code dealing with rare or endangered species. Section 15380 (b) was included in the Guidelines primarily to address situations in which a public agency is reviewing a project that may have a significant effect on a species that has not yet been listed by either the USFWS or CDFW. Thus, CEQA provides a lead agency with the ability to protect a species from a project's potential impacts until the respective government agencies have an opportunity to designate the species as protected, if warranted.

(7) California Native Plant Society. The California Native Plant Society (CNPS) is a non-governmental nonprofit organization that publishes an online rare plant inventory. The online inventory provides a Rare Plant Rank for each species. Although the CNPS has no regulatory authority and does not issue permits, the plant species it deems rare must be addressed under CEQA, per the CEQA Guidelines section 15380.

(8) San Francisco Bay Conservation and Development Commission. The BCDC is a California State planning and regulatory agency with regional authority over the San Francisco Bay. The BCDC has jurisdiction over Redwood Creek in San Mateo County, to its confluence with Smith Slough. A BCDC permit is required for projects that would fill or extract materials from areas within its jurisdiction.

(9) Other Statutes, Codes, and Policies Affording Limited Species Protection. The following treaty and local ordinance afford protection to certain birds and trees, respectively, that may occur on the project site.

Migratory Bird Treaty Act. The federal Migratory Bird Treaty Act (16 U.S.C., Sec. 703, Supp. I, 1989) prohibits killing, possessing, or trading in migratory birds except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs. Most native bird species on the project site are covered by this Act. The California Fish and Game Code (Sections 3503 and 3505) prohibits the take, destruction, or possession of any bird, nest, or egg of any bird unless express authorization is obtained from CDFW.

Redwood City Code of Ordinances. Chapter 35 of the Redwood City Code of Ordinances addresses tree preservation. It defines a tree as:

- A. Any woody plant characterized by having a single trunk of a circumference of thirty-eight inches (38") or more, measured at any point between six inches (6") and thirty-six inches (36") above ground level; or
- B. Any woody plant characterized by having a single trunk which has been found by the Park and Recreation Commission to have special significance to the community, which plant shall be designated a "heritage tree."

In order to lawfully cut a tree, one must obtain a permit from the Parks and Recreation Director.

Redwood City General Plan Policies. The Natural Resources Element of the City of Redwood City's 2010 General Plan includes policies encouraging the protection of biological resources. The primary biological resources policies applicable to the proposed project include the following:

- Program NR-8: Native Landscape/Drought Tolerant Plant Materials. Encourage and promote the use of native and/or drought tolerant plants in landscaping for existing and new development.
- Policy NR-5.1: Restore, maintain, and enhance Redwood City's creeks, streams, and sloughs to preserve and protect riparian and wetland plants, wildlife and associated habitats, and where feasible, incorporate public access.
- Policy NR-5.2: Limit construction activities to protect water quality in creeks and streams.
- Policy NR-5.3: Except for floating home communities, marinas, and the infrastructure necessary for the communities and marinas, prohibit building and development activities to establish a creek buffer zone, based on the site and floodplain characteristics and/or where sensitive species, communities, or habitats occur within the creek or 100-year floodplain, unless construction methods or other methods can substantially minimize damage from potential flooding.
- Policy NR-5.4: In conjunction with new development located along existing creeks and streams and where appropriate, incorporate daylighting for culverted portions or other bank naturalizing approaches for channeled sections as a means of creek and stream restoration.

- Policy NR-5.5: Except for floating home communities, marinas, and infrastructure necessary for the communities and marinas, regulate, and perhaps restrict, new development, grading, fills, and other land disturbances located immediately adjacent to a creek, stream, or in a 100-year floodplain, unless construction methods or other methods to minimize potential damage from flooding are implemented.
- Policy NR-5.6: Promote natural stream channel function.
- Policy NR-5.7: Preserve and protect riparian vegetation that functions to shade the creek and provide wildlife habitat.
- Policy NR-6.1: Ensure that new development minimizes encroachment into sensitive baylands habitats, and minimizes direct or indirect impact to sensitive biological resources while optimizing the potential for mitigation.
- Policy NR-6.2: Restore and maintain marshlands including tidal flats, tidal marshes, and salt marshes as appropriate.
- Policy NR-6-5: Take steps to reduce urban runoff into creeks and the Bay.
- Policy NR-6-6: Consider protection of upland areas adjacent to wetlands as potential habitat.
- Policy NR-7.2: Encourage the use of site and landscape designs that minimize surface runoff and retain or detain stormwater runoff, minimizing volume and pollutant concentrations.
- Policy NR-8.1: Pursue efforts to protect sensitive biological resources, including local, State, and federally designated sensitive, rare, threatened, and endangered plant, fish, and wildlife species and their habitats.
- Policy NR-8.2: Preserve and create contiguous wildlife habitat and movement corridors.
- Policy NR-8.5: Enhance fisheries habitat and restore access for native fishes in Redwood City's creeks.
- Program NR-22: Sensitive Species Identification. For development applications proposed for sensitive biological resource areas, require qualified biologists to identify and map all sensitive biological resources on the project site, including local, State and federally sensitive, rare, threatened, and endangered plant, fish, and wildlife species and their habitats using methods and protocols in accordance with the U.S. Fish and Wildlife Service, California Department of Fish and Game, and California Native Plant Society; and make recommendations for avoiding sensitive biological resources to the maximum extent feasible and pursuant to Program BE-2 in the Urban Form and Land Use Chapter of the Built Environment Element. These requirements shall be satisfied prior to the approval of any development proposal for the site.
- Program NR-23: Mitigate Adverse Impacts of Development. For new development proposals in the city in which unavoidable harm or removal of sensitive biological resources could occur, require the development of a compensation plan prior to City approval of any development proposal for the site. Compensation could include purchase of mitigation credits for the affected habitat types at an established mitigation bank, or preservation and enhancement of in-kind habitat types (preferably onsite). Required compensation ratios will be developed on a case-by- case basis in consultation with U.S.

Army Corps of Engineers, California Department of Fish and Game, San Francisco Regional Water Quality Control Board, and/or the U.S. Fish and Wildlife Service.

- Program NR-24: Creek Daylighting. Pursue efforts to maintain and restore creeks and streams to a more natural state through such measures as “daylighting” (reestablishing portions of the creeks above ground, where physically feasible), replacing concrete channels with natural creek beds and native vegetation, restoring riparian habitat, and creating linear parks along creeks while maintaining flood control capabilities. Complete a feasibility study that prioritizes the most appropriate sections and creeks to daylight. Include these strategies as part of the comprehensive plan accommodation for trails.
- Program NR-25: Creek Improvements. Wherever a new development or redevelopment project occurs on property containing or adjacent to an existing creek, require the project developer to improve and enhance the portion of the creek on or adjacent to the property, including daylighting and creek restoration wherever feasible. Permitted uses within creek buffer zones should be limited to habitat restoration, native riparian plantings, appropriate erosion control, trails, and flood control. Consider implementing a land banking system for critical open space areas along creek corridors.
- Program NR-28: NPDES. Continue to comply with all provisions of the National Pollutant Discharge and Elimination System (NPDES) permit, and support regional efforts by the San Francisco Bay Regional Water Quality Control Board (Regional Water Board) to improve and protect water quality.
- Program NR-29: State and Federal Regulations. Endeavor to comply with State and federal regulations pertaining to habitat and wildlife preservation.
- Program NR-30: SMCWPPP. Implement the San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) performance standards in the protection of creeks, streams, and watersheds.
- Program NR-31: Water Quality Improvement. Require the integration of water quality protection/improvement techniques (e.g., use of vegetated swales or landscaping for water drainage along streets and for expansive parking lots) for new development. As feasible, incorporate water quality techniques when completing street improvements.
- Program NR-33: Upland-Bayland Transition Zones. Determine if maintaining upland-bayland transition zones is necessary for wildlife refuge during high tide events and flooding. If appropriate, develop buffer zones between upland-bayland transition zones and development.
- Policy NR-9.1: Preserve, maintain, and expand the number of trees in Redwood City’s urban forest, on both public and private property.
- Policy NR-9.3: Select appropriate trees for Redwood City, focusing especially on native and landmark tree types.
- Program NR-41: Tree Protection and Preservation Enforcement. Continue to enforce all ordinances pertaining to tree protection and preservation including the Street Tree Ordinance and Tree Preservation Ordinance.

- Program NR-42: Tree Preservation Ordinance. Revise the Tree Preservation Ordinance (Chapter 35 in Municipal Code) to establish categories of trees to indicate priorities for preservation. Categories would provide a framework for tree permits and various levels of required mitigation measures. Consider including the following categories in the Tree Preservation Ordinance:
 - Established Tree. Any tree that is at least 10 inches in diameter, as measured 4.5 feet above natural or finished grade.
 - Mature Tree. Any tree that is at least 26 inches in diameter, as measured 4.5 feet above natural or finished grade.
 - Landmark Tree. Any tree which is at least 48 inches in diameter, as measured 4.5 feet above natural or finished grade or in excess of 40 feet in height.
 - Indigenous Tree. A naturally growing tree of the following species: redwood (*Sequoia sempervirens*); coast live oak (*Quercus agrifolia*); valley oak (*Quercus lobata*); canyon live oak (*Quercus chrysolepis*); blue oak (*Quercus douglasii*), black oak (*Quercus kelloggii*), canyon oak (*Quercus chrysolepis*), leather oak (*Quercus durata*), California buckeye (*Aesculus californicus*); California bay (*Umbellularia californica*), Douglas fir (*Pseudotsuga menziesii*), arroyo willow (*Salix lasiolepis*), sycamore (*Platanus racemosa*), box elder (*Acer negundo* var. *californica*), big leaf maple (*Acer macrophyllum*), Oregon ash (*Fraxinus latifolia*), and other species known to be native to the region.

As part of the Tree Preservation Ordinance revision, consult the Community Task Force on Tree Policies Study, September 2006.
- Program NR-45: Tree Replacement. Require removed trees, whether on public or private property, to be replaced with a new tree in the closest appropriate planting site to mitigate loss, as feasible.

2. Impacts and Mitigation Measures

The following subsection provides a discussion of potential impacts to biological resources that could result from construction and operation of the proposed project. The section begins with the criteria of significance, which establish the thresholds used to determine whether an impact is significant. The latter part of this section presents the impacts associated with the proposed project and identifies mitigation measures, as appropriate.

a. Criteria of Significance. Implementation of the proposed project would have a significant impact on the environment related to biological resources if it would:

- Result in substantial reduction in numbers of, restriction in range for, or loss of habitat for a population of any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFW or USFWS;

- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act through direct removal, filling, hydrological interruption, or other means;
- Create substantial interference with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites; or
- Conflict with the provisions of an approved local, regional or State policy or ordinance protecting biological resources, such as a tree preservation policy or ordinance.

b. Project Impacts. The following section discusses potential biological resources impacts associated with implementation of the proposed project. Potential impacts are differentiated between temporary construction-related impacts and permanent operational impacts. Impacts are evaluated for both the proposed project and the proposed project variant.

(1) Habitat Loss and Effects on Special-status Species. Development of the proposed project would not result in the permanent loss of habitat for any special-status plant or animal species. Although there is some chance that white-tailed kites may nest in the trees on the site, the reduction of nesting habitat would be temporary as any trees removed would be replaced with new trees. Approximately 262 new trees would be planted on the project site and along the proposed Bay Trail segment (this does not include the additional trees to be planted along the Blomquist Street Extension right of way). During construction and once the project is completed, there would be more people and disturbance on the project site. However, the site is already highly disturbed and surrounded by human activities; therefore, this increase in disturbance would be negligible.

Nonetheless, if project activities take place during the nesting season and directly result in take of a white-tailed kite nest or the nest of any bird species protected by the Migratory Bird Treaty Act, impacts to special-status bird species could occur. In addition, if water quality is impacted during construction by sediment or hazardous materials entering the creek, it could affect longfin smelt, if any are present in the creek. These potential impacts would be the same for both the proposed project and proposed project variant. There would be no dredging, equipment, or open water work in Redwood Creek; however, nearby construction activities could affect water quality through runoff or discharge. These impacts are discussed below, and mitigation measures are recommended to reduce these impacts to a less-than-significant level.

Impact BIO-1: Construction of the proposed project and the project variant could result in impacts to nesting white-tailed kites and other native birds protected under the federal Migratory Bird Treaty Act and California Fish and Game Code. (S)

Project construction would result in the removal of trees and other vegetation that could be used by nesting birds, including the white-tailed kite, which is also a special-status species. If conducted during the nesting season (February 1 to August 31), project activities could directly impact nesting birds by removing trees (including dead trees) or shrubs that support active nests. Grading and site preparation activities could also destroy or disturb nests in shrubs or on bare ground. Construction-related disturbance (e.g., noise, vehicle traffic, personnel working adjacent to suitable nesting habitat) could also indirectly impact nesting birds by causing adults to abandon nests in nearby trees or other vegetation, resulting in nest failure and reduced reproductive potential. Implementation of the

following mitigation measure would reduce potential impacts to nesting birds to a less-than-significant level.

Mitigation Measure BIO-1: To the extent feasible, initial grading and vegetation removal activities shall occur during the non-nesting season (September 1 to January 31). For any construction activities conducted during the nesting season, a qualified biologist (i.e., experienced in searching for passerine nests) shall conduct a preconstruction nest survey of all trees or other suitable nesting habitat in and within 250 feet of the limits of construction activities. The survey shall be conducted no more than two days prior to the start of work. If the survey indicates the presence of nesting birds, the biologist shall determine an appropriately sized buffer around the nest in which no work shall occur until the young have successfully fledged. The size of the nest buffer shall be determined by the biologist and shall be based on the nesting species and its sensitivity to disturbance. In general, buffer sizes of up to 250 feet for raptors and 50 feet for other birds should suffice to prevent substantial disturbance to nesting birds, but these buffers may be increased or decreased, as appropriate, depending on the bird species and the level of disturbance anticipated near the nest. (LTS)

Impact BIO-2: Construction of the proposed project and the project variant could result in impacts to longfin smelt, a special-status species, and other native fish species. (S)

Construction of the proposed project could result in significant impacts to water quality which could in turn result in impact to longfin smelt, if present within Redwood Creek. Specifically, the proposed project could exceed applicable water quality standards and discharge requirements; substantially degrade water quality of downstream receiving waters (including Redwood Creek, and ultimately South San Francisco Bay) through pollutant discharges, physical or chemical changes of water bodies, or increased erosion and sedimentation; discharge additional sources of polluted runoff to the storm drainage system; and result in on- or off-site erosion through alteration of the existing drainage pattern. Impaired water quality could kill or injure longfin smelt that are attempting to spawn. As previously discussed, the proposed project would be required to comply with the Construction General Permit, which requires preparation and implementation of a SWPPP that includes erosion and sediment control BMPs. Compliance with these State regulations would help ensure that the proposed project would have a less than-significant-impact related to erosion and siltation during construction activities. Furthermore, implementation of Mitigation Measures HYD-1 through HYD-4 as outlined in Section IV.H, Hydrology and Water Quality, as well as the following measures would ensure that the proposed project would prevent impacts to longfin smelt and other fish and that this impact would be less than significant.

Mitigation Measure BIO-2a: If in-water work is required in Redwood Creek the work shall be restricted to the period between August 1 and November 30 when longfin smelt are unlikely to be present.

Mitigation Measure BIO-2b: For any dewatering that could occur during the construction period, all discharge water shall be pumped into a temporary siltation pond/desilting basin, Baker tank, or similar detention device for settling of sediments prior to their release downstream in accordance with the approved Stormwater Pollution Prevention Plan.

Mitigation Measure BIO-2c: Excavated material shall not be placed on aquatic vegetation, or allowed to fall or be transported into Redwood Creek.

Mitigation Measure BIO-2d: Silt-trapping devices shall be used to minimize downstream sedimentation.

Mitigation Measure BIO-2e: Rock riprap in low-flow channels shall only be used where riprap is determined to be the only feasible stabilization approach. Individual bank stabilization activities using rock riprap shall not exceed 500 feet in length along the bank, and the amount of riprap used shall not exceed 1 cubic yard per running foot placed along the bank below the ordinary high water mark without specific authorization from the applicable resource agency. (LTS)

Impact BIO-3: Construction activities associated with the proposed project and the project variant could interfere with the movement or habitat quality of white-tailed kite and longfin smelt. (S)

Construction activities occurring on the project site could interfere with the movement or habitat quality of two special-status species that may be present on or adjacent to the site, longfin smelt and white-tailed kite. Construction activities occurring on the project site could also interfere with the movement or habitat quality of other native wildlife species that may be present on the site. Implementation of the following general wildlife protection measures would reduce this impact to a less-than-significant level.

Mitigation Measure BIO-3a: Prior to the initiation of construction activities (including demolition, and staging) all personnel associated with project construction shall attend an Environmental Awareness Training. The training should be conducted by a qualified biologist, to aid workers in recognizing special-status resources that may occur in the project area. The specifics of this program should include identification of the special-status species and habitats, a description of the regulatory status, and review of the measures required to reduce impacts to biological resources on the project site. Each worker shall be given a handout with key points. At the end of the training, all workers should sign to document their participation in the program and understanding of the measures.

Mitigation Measure BIO-3b: No pets or firearms shall be allowed at the project site, with the exception of authorized law enforcement personnel.

Mitigation Measure BIO-3c: All food-related trash that may attract predators and vermin shall be properly contained and removed from the work site daily.

Mitigation Measure BIO-3d: All refueling, maintenance, and staging of equipment and vehicles shall occur at least 100 feet from the top of bank of Redwood Creek. Secondary containment shall be used during refueling. A spill prevention plan shall be in place prior to the initiation of demolition or construction activities.

Mitigation Measure BIO-3e: All vehicles and equipment shall be maintained in good working condition and free of leaks.

Mitigation Measure BIO-3f: Standard Best Management Practices (BMPs) shall be employed to avoid degradation of aquatic habitat by maintaining water quality and controlling erosion and sedimentation during construction as required by compliance with the General National Pollution Discharge Elimination System Permit for Construction Activities.

BMPs shall include, but not be limited to, installation of silt fencing and erosion control wattles between Redwood Creek and construction activities.

Mitigation Measure BIO-3g: To prevent the entanglement of wildlife, no erosion control devices containing plastic monofilament netting shall be used or stored on site. (LTS)

(2) Riparian Habitat. There is no riparian habitat with native vegetation on the project site. Therefore, development of either the proposed project or the proposed project variant would not result in any impacts to riparian habitats.

(3) Federally Protected Wetlands. Neither the proposed project nor proposed project variant would directly impact Redwood Creek, which is a traditionally navigable waterway and subject to Corps jurisdiction, through filling or hydrological interruption. However, development of the proposed project and proposed project variant could impact three other jurisdictional wetlands through removal, filling and/or hydrological interruption. As previously discussed, Wetland Ditch 1 is located on the southeast side of Maple Street adjacent to the City of Redwood City Police Department and consists of a freshwater emergent wetland. Wetland Ditch 2 is located on the northwest side of Maple Street, and consists of an approximately 315-foot-long, 10-foot-wide drainage ditch that is a seasonal wetland. Wetland Ditch 3 is located in the proposed project variant area on the western edge of the eastern portion of Maple Street and is a seasonal wetland.

The wetland delineation prepared for the project site has not been verified by the Corps, but states that within the area studied there are approximately 0.30 acres of seasonal wetlands (a portion of which was verified by the Corps in 2013) and 0.04 acres of freshwater emergent wetlands and potentially within Corps Section 404 jurisdiction. Impacts to wetland areas for the proposed project and project variant are outlined below.

- Proposed Project:
 - Wetland Ditch 1 would not be impacted.
 - Wetland Ditch 2 would be completely filled, and residences would be built on top of it. The area filled would be approximately 2,426.3 square feet (0.056 acre).
 - Wetland Ditch 3 would not be impacted.
- Proposed Project Variant:
 - Wetland Ditch 1 would be partially filled. The area filled would be approximately 5,400 square feet (0.124 acre).
 - Wetland Ditch 2 would be completely filled, and residences would be built on top of it. The area filled would be approximately 2,426.3 square feet (0.056 acre).
 - Wetland Ditch 3 would be partially filled. The area filled would be approximately 580 square feet (0.013 acre).

Impact BIO-4: Construction of the proposed project and the project variant could have a substantial adverse effect on federally protected seasonal wetlands and freshwater emergent wetlands as defined by Section 404 of the Clean Water Act, as well as waters of the State as defined through the Porter-Cologne Water Quality Control Act. Up to 0.056 acres could be affected by the proposed project and an additional 0.137 acres could be affected by the project variant. (S)

Construction of the proposed project could directly impact one of the identified drainages (Wetland Ditch 2) within the project site, totaling approximately 0.056 acre of federally protected wetlands. Construction of the proposed project variant could directly impact two of the identified drainages (Wetland Ditches 1 and 3), totaling approximately 0.137 acre of federally protected wetlands.

Implementation of the following mitigation measures would ensure that this impact would be reduced to a less-than-significant level through compliance with regulatory requirements.

Mitigation Measure BIO-4a: The project applicant shall file a Report of Waste Discharge with the Regional Water Board and comply with all project-specific Waste Discharge Requirements issued by the Regional Water Board during the Report of Waste Discharge approval process.

Mitigation Measure BIO-4b: All waters of the U.S and waters of the State filled by the project shall be mitigated as required by applicable agency permits that shall be obtained prior to the initiation of construction. Mitigation may be accomplished by: (1) off-site creation of new seasonal wetlands at an appropriate mitigation site; or (2) purchase of credits at an approved off-site mitigation bank.

If the mitigation is to be accomplished by creating new wetlands at an off-site location owned or otherwise controlled by the applicant, the applicant shall prepare and implement a wetland mitigation and monitoring plan (MMP) detailing the mitigation design, wetland planting design, maintenance and monitoring requirements, reporting requirements, and success criteria. Mitigation wetlands shall be monitored for a minimum of five years to verify that the success criteria have been achieved. The applicant shall also provide financial assurances for the operation and monitoring of the created wetlands. The MMP shall be approved by the Regional Water Board and the City prior to approval of the Final Map.

The purchase of mitigation credits from the mitigation bank would accomplish the goal of the California Wetlands Conservation Policy (“No Net Loss Policy;” Executive Order W-59-93) to “ensure no overall net loss and achieve a long-term net gain in the quantity, quality, and permanence of wetlands acreage and values in California.” A credit purchase agreement or receipt shall be provided prior to approval of the grading plan. (LTS)

(4) Wildlife Movement and Nursery Sites. Development of the proposed project and the project variant would not create any significant new permanent barriers to terrestrial or aquatic wildlife movement. Implementation of Mitigation Measures BIO-1 and BIO-2 would ensure that impacts to nesting birds and special-status wildlife species would be less than significant. In addition, implementation of Mitigation Measure BIO-3 would further ensure that impacts to common wildlife species that may be present on or move through the project site would be less than significant.

(5) Local Policy Conflicts. An Arborist Report was prepared for the proposed project and the tree inventory included in the report identified the existing number of trees to be removed from the project site with development of both the proposed project and the project variant as well as the overall condition of the trees.¹⁴ To develop the proposed project, 42 protected trees would be removed from the site. None of these 42 trees were rated as being in “very good” or “good” condition. The majority were rated as being in “fair” condition. With the proposed project variant, an additional five protected trees would be removed. Of these five protected trees, four were rated as “very poor” and one was rated as “poor.” Per the City’s Municipal Code, tree removal permits would be required to be obtained prior to removal of the trees; therefore, the proposed project and the project variant would not conflict with Chapter 35 of the Redwood City Code of Ordinances. In addition, the proposed project would include planting of approximately 262 new trees throughout the site and along the Bay Trail and shoreline, as well as additional trees along the Blomquist Street right of way. Consistent with General Plan Policy NR-9.3, the applicant would be required to select appropriate trees for Redwood City, focusing especially on native tree species. New trees planted along the shoreline would provide wildlife habitat and shade along Redwood Creek, consistent with General Plan Policy NR 5-7.

General Plan Program NR-25 requires developers of projects adjacent to creeks to improve and enhance the portion of the creek on or adjacent to the property. It also states that uses permitted within a buffer zone of the creek should be limited to habitat restoration, native riparian plantings, appropriate erosion control, trails, and flood control. Currently, the bank of Redwood Creek adjacent to the project area is in poor condition, with failing, unsafe concrete walls and riprap. The demolition of these structures would result in a net overall gain to the size of Redwood Creek, although small. Construction activities would be set back a minimum of 5 feet from the current top of bank. The new bank would have a shallower slope and would be planted with native saltmarsh or intertidal zone plants such as pickleweed, thereby restoring habitat. The proposed new 12-foot-wide paved segment of the Bay Trail would run along the creek within a minimum 30-foot-wide shoreline greenway and would provide a buffer in compliance with General Plan Program NR-25.

Given the above, the proposed project and the project variant would not conflict with any policies or ordinances protecting biological resources and this impact would be less than significant.

c. Cumulative Impacts. For biological resources, the scope for assessing cumulative impacts encompasses other past, current, or probable future projects under City review and located within approximately 0.25 mile of the project site. The project would have a significant effect on the environment if it—in combination with other projects—would contribute to a significant cumulative impact on biological resources. Projects considered for this cumulative impact analysis are identified in Section IV, Setting, Impacts and Mitigation Measures of this EIR.

As described above, with implementation of Mitigation Measures BIO-1 through BIO-3, the proposed project would result in less than significant impacts to special-status and native bird species, longfin smelt, and movement of common wildlife species. Recommended mitigation measures to reduce these impacts are standard measures recommended for similar development projects. No habitats for special-status plant or wildlife species would be adversely affected by the proposed project. The

¹⁴ Matthew Fried, 2017. ISA Certified Arborist MA-4851A. Tree Inventory 1548 Maple St.

project, therefore, would not combine with the effects of other projects in the vicinity to contribute to a significant cumulative impact on these resources.

Development of the proposed project and the proposed project variant would result in the removal of less than 0.25 acres of federally protected isolated wetlands. Given the small scope of wetland removal on the site and implementation of Mitigation Measures BIO-4a and BIO-4b, which would result in the creation or preservation of higher quality wetlands at an off-site location, the incremental loss of wetlands on the site would not be cumulatively considerable.

When future development proposals are considered by the City, these proposals would undergo environmental review pursuant to CEQA, and when necessary, mitigation measures would be adopted as appropriate. In most cases, this environmental review and compliance with project conditions of approval, relevant policies and mitigation measures of applicable Precise Plans (e.g., the Downtown Precise Plan and Stanford in Redwood City Precise Plan), and the General Plan, and compliance with the requirements of the applicable regulatory agencies such as the USFWS, CDFW, Corps, Regional Water Board, etc., would ensure that significant impacts to biological resources would be avoided or otherwise mitigated to less-than-significant levels.

For these reasons, the proposed project would not result in or contribute to any significant cumulative impacts to biological resources and cumulative impacts to these resources would be less than significant.

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C. CULTURAL RESOURCES

This section describes existing cultural resources conditions within the project site and vicinity, identifies potentially significant impacts to such resources that may result from project implementation, and recommends mitigation measures to reduce the severity of potentially significant impacts. Potential impacts associated with implementation of both the proposed project and the project variant would be similar with respect to cultural resources and are not differentiated in this section. Impacts to tribal cultural resources are evaluated in the Initial Study prepared for the proposed project (see Appendix B) and these impacts were determined to be less than significant.

Cultural resources are sites, buildings, structures, objects, and districts that may have traditional or cultural value due to their historical significance. The California Environmental Quality Act (CEQA) requires that agencies considering projects that are subject to discretionary action shall consider the potential impacts on cultural resources that may occur from project implementation (see Section 15064.5 and Appendix G of the CEQA Guidelines).

1. Setting

This section describes the methods used to establish the baseline conditions for cultural resources at the project site; provides a brief overview of the pre-contact,¹ ethnographic, and historical contexts for the project; describes the cultural resources identified at the project site and their potential significance under CEQA; and presents the State legislative and regulatory context for cultural resources.

a. Methods. To identify cultural resources—and the potential for such resources—at the project site, the following tasks were completed: (1) archival records searches of regional cultural resources databases; (2) a literature and historical map review, including documentation previously prepared for the Inner Harbor Specific Plan (IHSP) Draft EIR; and (3) outreach with local Native American tribes. These tasks are described below.

(1) Records Searches. Cultural resource records searches were completed for the project on August 28, 2017, at the Northwest Information Center (NWIC) of the California Historical Resources Information System and at the Native American Heritage Commission (NAHC) in West Sacramento on May 31, 2017. The NWIC, an affiliate of the California Office of Historic Preservation, is the official State repository of cultural resource records and reports for San Mateo County; the NAHC is a State agency responsible for maintaining the Sacred Lands File, which is a list of site locations that are of traditional, religious, and cultural importance to California Native American tribes.

The records searches were completed to update previous archival research done in September 2013 for the IHSP Draft EIR.

(2) Literature Review. Literature and maps were reviewed to assess the potential for significant cultural resources at the project site. Literature reviewed included previous historical

¹ “Pre-contact,” as used here, refers to Native American populations before the arrival of European and American colonists and settlers.

resources evaluations completed for the IHSP Draft EIR,^{2,3} cultural resource studies completed at or near the project site,^{4,5,6,7,8} and geologic information to assess the potential for buried pre-contact archaeological cultural resources and paleontological resources.^{9,10}

(3) Native American Outreach. The NAHC identified five local Native American tribes that may have information or concerns regarding sites of tribal significance at or near the proposed project.¹¹ On July 6, 2017, the City sent the Notice of Preparation of an EIR to all five tribes identified by the NAHC to request information or concerns regarding the project. The City has received no responses to date from any of the tribes contacted.

b. Cultural Resources Overview. The pre-contact, ethnographic, historical, and paleontological contexts for the project are summarized below.¹²

(1) Pre-contact and Ethnographic Overview. Categorizing the prehistoric period into cultural stages allows researchers to describe a broad range of archaeological resources with similar cultural patterns and components during a given timeframe, thereby creating a regional chronology. Milliken et al.¹³ provide a framework for the interpretation of the San Francisco Bay Area who have divided human history in the San Francisco Bay Area into four periods: the Paleoindian Period (11,500 to 8000 B.C.), the Early Period (8000 to 500 B.C.), the Middle Period (500 B.C. to A.D. 1050), and the Late Period (A.D. 1050 to 1550). Economic patterns, stylistic aspects, and regional

² ESA, 2015. Department of Parks and Recreation Primary Record Form 523 A and B, Peninsula Yacht Club. April 6.

³ ESA, 2016. Department of Parks and Recreation Primary Record Form 523 A and B, record update for the Peninsula Yacht Club. September 20.

⁴ Cartier, Robert, 1977. *Archaeological Reconnaissance for the Proposed Addition to the San Mateo County Work Furlough Facility off Maple Street, San Mateo County.*

⁵ Dietz, Stephen A., 1978. Letter report describing cultural resource survey results for the Peninsula Boardwalk project at 1025 Veterans Boulevard, Redwood City.

⁶ Psota, Sunshine, 2012. *Archaeological Survey for the 48-Inch Force Main Reliability Improvement Project, Cities of San Carlos and Redwood City, San Mateo County, California.*

⁷ Psota, Sunshine, 2015. *Results of Archaeological Monitoring along Maple Street for SCVW 48-inch Force Main, San Mateo County, California.*

⁸ Wohlgenuth, Eric, and Philip Kaijankoski, 2016. *Archaeological Survey and Extended Phase I Testing for the Silicon Valley Clean Water Project, San Mateo County, California.*

⁹ Brabb, E.E., R.W. Graymer, and D.L. Jones, 2000. *Geologic Map and Map Database of the Palo Alto 30' x 60' Quadrangle, California.* Available online at: pubs.usgs.gov/mf/2000/mf-2332/mf2332m.pdf (accessed October 12, 2017).

¹⁰ ENGEO, 2017. *Geotechnical Exploration, 1548 Maple Street, Redwood City, California.* February 7.

¹¹ Native American Heritage Commission, 2017. Letter Re. 1548 Maple Street, San Mateo County. May 31

¹² This section is adapted from the IHSP Draft EIR (October 2015). This document is available online at: www.redwoodcity.org/departments/community-development-department/planning-housing/planning-services/general-plan-precise-plans/inner-harbor-specific-plan (accessed October 12, 2017).

¹³ Milliken, Randall et al., 2007. Punctuated Culture Change in the San Francisco Bay Area, in *California Prehistory: Colonization, Culture, and Complexity*, edited by T.L. Jones and K.A. Klar, pp. 99-123, Lanham, MD: Alta Mira Press.

phases further subdivide cultural patterns into shorter phases. This scheme uses economic and technological types, socio-politics, trade networks, population density, and variations of artifact types to differentiate between cultural periods.

The Paleoindian Period (11,500 to 8000 B.C.) was characterized by big-game hunters occupying broad geographic areas. Evidence of human habitation during the Paleoindian Period has not yet been discovered in the San Francisco Bay Area. During the Early Holocene (Lower Archaic; 8000 to 3500 B.C.), geographic mobility continued from the Paleoindian Period and is characterized by the milling slab and handstone as well as large wide-stemmed and leaf-shaped projectile points. The first cut shell beads and the mortar and pestle are first documented in burials during the Early Period (Middle Archaic; 3500 to 500 B.C.), indicating the beginning of a shift to sedentism. During the Middle Period, which includes the Lower Middle Period (Initial Upper Archaic; 500 B.C. to A.D. 430), and Upper Middle Period (Late Upper Archaic; A.D. 430 to 1050), geographic mobility may have continued, although groups began to establish longer-term base camps in localities from which a more diverse range of resources could be exploited. The first rich black middens are recorded from this period. The addition of milling tools, obsidian and chert concave-base projectile points, and the occurrence of sites in a wider range of environments suggest that the economic base was more diverse. By the Upper Middle Period, mobility was being replaced by the development of numerous small villages. Around A.D. 430 a “dramatic cultural disruption” occurred evidenced by the sudden collapse of the *Olivella* saucer bead trade network. During the Initial Late Period (Lower Emergent; A.D. 1050 to 1550), social complexity developed with large, central villages with resident political leaders and specialized activity sites. Artifacts associated with the period include the bow and arrow, small corner-notched projectile points, and a diversity of beads and ornaments.

At the time of Spanish contact, the Ohlone inhabited what is today Redwood City. Economically, Ohlone engaged in hunting and gathering. Their territory encompassed both coastal and open valley environments that contained a wide variety of resources, including grass seeds, acorns, bulbs and tubers, bear, deer, elk, antelope, a variety of bird species, and rabbit and other small mammals. The Ohlone acknowledged private ownership of goods and songs, and village ownership of rights to land and/or natural resources; they appear to have aggressively protected their village territories, requiring monetary payment for access rights in the form of clamshell beads, and even shooting trespassers if caught. After European contact, Ohlone society was severely disrupted by the missions, disease, and displacement. Today, the Ohlone still have a strong presence in the San Francisco Bay Area, and are highly interested in their past.

(2) History. Redwood City and Redwood Creek were named for the nearby Coast Redwood forest and lumbering industry. The Redwood Creek channel was first used for commercial shipping in the 1850s to transport timber from redwood forests on the peninsula to San Francisco. Ship building activities and other industries also located along the shoreline of Redwood Creek channel. By the late 1800s, the channel was lined with wharves and associated business establishments. Particularly important was the shipment of wood products like shingles, as well as grain and livestock from surrounding agricultural areas.

The tanbark that was left behind by lumber shipping operations was utilized by local tanneries for the tanning of hides for processed leather goods. These tanneries included the Krieg Tannery (later the Beeger Tannery), the California Oak Leather Company, and the S.H. Frank Tanning Company. The S.H. Frank Tanning Company, located on the southeast side of Redwood Creek partially within the

project site, was owned and operated by the Frank family from 1880 to 1959 and employed up to 450 men. The tannery buildings were nearly all wood frame, utilitarian structures, from one to three stories in height depending upon their function, and had large brick chimneys. Most were wood construction throughout, including siding and roofing, although some buildings had metal siding. The historic buildings and structures associated with the tannery burned down in 1968.

(3) Paleontology. On a regional scale, fossilized plants, animals and microorganisms are prevalent throughout the Bay Area. For example, many of the hills in the Bay Area are made up of sedimentary bedrock that is known to contain a wide range of fossils, including radiolarians, mollusks, diatoms, foraminifers and non-marine vertebrates. In addition, even geologically young fluvial deposits have been known to contain fresh water mollusks and extinct late Pleistocene vertebrate fossils. However, the project site overlies young Holocene-age geologic units. Beneath a cap of artificial fill lies deposits of mud and silt associated with the present-day bay estuary (Bay Mud). These types of geologic deposits are too young (i.e., less than 10,000 years old) to have fossilized the remains of organisms, or to have preserved vertebrate fossils.

c. Regulatory and Legislative Context. The following describes the State and local regulatory and policy requirements for cultural resources that are relevant to the proposed project.

(1) CEQA Requirements. CEQA applies to all discretionary projects undertaken or subject to approval by the state's public agencies (14 CCR Section 15002(i)). Under the provisions of CEQA, "A project with an effect that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment" (14 CCR Section 15064.5(b)).

CEQA Guidelines Section 15064.5(a) defines a "historical resource" as a resource that meets one or more of the following criteria:

- Listed in, or eligible for listing in, the California Register of Historical Resources (as defined under California Public Resources Code [PRC], Section 5024.1; 14 CCR Section 4850, *et seq.*);
- Listed in a local register of historical resources (as defined at PRC Section 5020.1(k));
- Identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g); or
- Determined to be a historical resource by a project's lead agency (14 CCR Section 15064.5(a)).

A historical resource consists of "Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California... Generally, a resource shall be considered by the lead agency to be 'historically significant' if the resource meets the criteria for listing in the California Register of Historical Resources" (14 CCR Section 15064.5(a)(3)).

If an impact on a historical or archaeological resource is significant, CEQA requires feasible measures to minimize the impact (14 CCR Section 15126.4 (a)(1)). Mitigation of significant impacts

must lessen or eliminate the physical impact that the project would have on the resource. Generally, a project that follows the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings (Weeks and Grimmer, 1995) shall be considered mitigated to a level of a less-than-significant impact on the historical resource (14 CCR Section 15064.5(b)(3)). The use of drawings, photographs, and/or displays does not typically mitigate the physical impact on the environment caused by demolition or destruction of a historical resource. However, CEQA requires that all feasible mitigation be undertaken even if it does not mitigate impacts to less-than-significant levels (14 CCR Section 15126.4(a)(1)).

(2) California Assembly Bill 52 (AB 52). Assembly Bill 52, which became law on January 1, 2015, provides for consultation with California Native American tribes during the CEQA process, and equates significant impacts to "tribal cultural resources" with significant environmental impacts. PRC Section 21074 states that "tribal cultural resources" are:

- Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe and are one of the following:
 - Included or determined to be eligible for inclusion in the California Register of Historical Resources.
 - Included in a local register of historical resources as defined in subdivision (k) of PRC Section 5020.1.
 - 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 PRC Section 5024.1. In applying the criteria set forth in subdivision (c) of PRC Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

A "historical resource" (PRC Section 21084.1), a "unique archaeological resource" (PRC Section 21083.2(g)), or a "nonunique archaeological resource" (PRC Section 21083.2 (h)) may also be a tribal cultural resource if it is included or determined to be eligible for inclusion in the California Register.

The consultation provisions of the law require that a public agency consult with local Native American tribes that have requested placement on that agency's notification list for CEQA projects. The City has received no requests from the local Native American tribes, and no consultation with tribes was required or completed for the project. Tribal cultural resources are addressed in the Initial Study prepared for the project (see Appendix B).

(3) California Public Resources Code Section 5097.98. Section 5097.98 of the California Public Resources Code states that the NAHC, upon notification of the discovery of Native American human remains pursuant to Health and Safety Code Section 7050.5 (discussed below), shall immediately notify those persons (i.e., the Most Likely Descendent or "MLD") it believes to be descended from the deceased. With permission of the landowner or a designated representative, the MLD may inspect the remains and any associated cultural materials and make recommendations for treatment or disposition of the remains and associated grave goods. The MLD shall provide recommendations or preferences for treatment of the remains and associated cultural materials within 48 hours of being granted access to the site.

(4) **California Health and Safety Code Section 7050.5.** Section 7050.5 of the California Health and Safety Code states that, in the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the remains are discovered has determined whether or not the remains are subject to the coroner's authority. If the human remains are of Native American origin, the coroner must notify the NAHC within 24 hours of this identification. The NAHC will identify a Native American MLD to inspect the site and provide recommendations for the proper treatment of the remains and associated grave goods.

(5) **Redwood City General Plan.** The Redwood City General Plan includes a *Built Environment Element* that identifies policies for historical resources. Policies that are relevant to the project are summarized below.

- Policy BE-37-1: Enhance, restore, preserve, and protect, as appropriate, historic resources throughout the city.
- Policy BE-37-2: Preserve historic landmark structures, landscapes (including trees), trails, and sites that serve additional community needs, such as recreational open space and/or cultural needs.
- Policy BE-37.3: Encourage the retention and/or adaptive reuse of historic residential, commercial, and industrial buildings.
- Policy BE-37.8: Permit removal of non-contributing elements of structures in or adjacent to designated historic resources to allow replacement by compatible, historically appropriate structures.

(6) **City of Redwood City Historic Resources Code.** Chapter 40 of the Redwood City Municipal Code establishes the Redwood City Historic Preservation Ordinance, which is intended to safeguard the City's heritage by providing for the protection of historic landmarks, encouraging public knowledge of the City's history, and fostering a sense of identity in the community. The City Council may designate a historic landmark, historic site, or historic district if it meets the following criteria pursuant to Section 40.6 of Chapter 40:

- Criterion A: It exemplifies or reflects special elements of the City's cultural, aesthetic, or architectural history; or
- Criterion B: It is identified with persons or events significant in local, State, or national history; or
- Criterion C: It embodies distinctive characteristics of a style, type, period or method of construction, or is a valuable example of the use of indigenous materials or craftsmanship; or
- Criterion D: It is representative of the notable work of a builder, designer or architect.

The Historic Resources Advisory Committee advises the Redwood City Planning Commission regarding the implementation of the City's Historic Preservation Ordinance. The Committee recommends historic designation of local landmarks and districts, performs design review of changes to historic buildings and adjacent affected sites, and is involved in other historic preservation-related activities.

d. Project Site Cultural Resources. This section describes the cultural resources, and potential for such resources, within the project site as determined from the tasks described in Section 1.a above, including the records searches and literature review.

(1) Built Environment Resources. A review of the NWIC database and documentation completed for the IHSP EIR indicates that there are two previously recorded built-environment cultural resources at the project site. These resources are described below.

Frank's Tannery Site. The Redwood City Historic Resources Inventory and California Office of Historic Preservation Directory of Properties list "Frank's Tannery Site." The project site is included within a larger, approximately 19-acre area southeast of Redwood Creek that the Frank family operated as a tannery from the 1880s to 1959. A fire in 1968 destroyed most of the structures at Frank's Tannery; those structures that survived the fire were condemned and the site was razed in 1970.

Water Tank. The Water Tank is located at the project site adjacent to Redwood Creek. The structure is two-stories high, comprised of a circular riveted steel tank approximately 20 feet tall and 30 feet in diameter on the second floor, supported by a wood-frame structure that is rectangular in plan on the ground floor. The structure is estimated to have been built circa 1915, and it has been reported that the tank was built to supply water to the schooners that sailed Redwood Creek into the heart of Redwood City when the wharves and turning basin were located near the present day City Hall.¹⁴ The structure was heavily modified around 1965 and is currently used by the Peninsula Yacht Club as a clubhouse, bar, and restaurant.

The Water Tank was recently evaluated for its eligibility for listing in the National Register of Historic Places (NRHP), the California Register of Historical Resources (CRHR), and for local landmark designation pursuant to the Redwood City Historic Preservation Ordinance.¹⁵ The findings of that evaluation are presented below under the relevant criteria for listing.

National and State Historical Registers. The findings of the NRHP and CRHR evaluations conducted for the Water Tank are described below under the applicable criteria.

- **NRHP/CRHR Criterion A/1 (Association with Historic Events).** Although it is the oldest remaining structure in the area, and the original portions of the former Water Tank may have once been associated with Redwood City's redwood lumber shipping industry along the Redwood Creek channel, the structure would not be eligible for listing in the NRHP or CRHR due to the numerous modifications completed in the 1960s (and later) to convert it for use as a club house, bar, and restaurant. Although the tank itself remains partially visible above the base, the modifications in the 1960s and later have reduced the integrity of the original structure to a point where it no longer conveys historical associations with the City's earlier redwood shipping industry. For these reasons, the Water

¹⁴ Callister, Lee, 2014. Docktown's Historic Yacht Club Building is a Redwood City Icon. *Redwood City Patch*. Website: patch.com/california/redwoodcity-woodside/docktowns-historic-tank-building (accessed October 2017). January 8.

¹⁵ ESA, 2016. op. cit.

Tank structure is not considered to be eligible for listing in the NRHP or the CRHR under Criterion A/1.

- **NRHP/CRHR Criterion B/2 (Association with Important Persons).** Research revealed no associations of the Water Tank with persons significant in national, State, or local history. For these reasons, the structure is not considered to be eligible for listing in the NRHP or CRHR under Criterion B/2.
- **NRHP/CRHR Criterion C/3 (Architecture/Work of a Master).** Constructed of a redwood timber base supporting a riveted steel tank, including numerous modifications beginning in the 1960s, the Water Tank does not embody the distinctive characteristics of a particular style, type, period or method of construction, nor is it a valuable example of the use of indigenous materials or craftsmanship. Although the structure's redwood timbers are an indigenous material, the modifications in the 1960s and later have reduced the integrity of the original structure to a point where it no longer conveys architectural associations with the city's earlier redwood shipping industry. Research conducted for the IHSP EIR revealed no associations with the work of a notable builder, designer, or architect. For these reasons, the structure is not considered to be eligible for listing in the NRHP or CRHR under Criterion C/3.

In summary, the Water Tank does not meet any of the federal or State register criteria because the modifications to it have reduced the integrity of the original structure to a point where it no longer conveys strong historical or architectural/structural associations with Redwood City's earlier redwood shipping industry.

Local Assessment. The Water Tank appears eligible for local designation as a landmark as it: (1) "exemplifies or reflects special elements of the City's cultural, aesthetic, or architectural history" (City Municipal Code Section 40.6.A), and (2) is identified with events significant in local history (City Municipal Code Section 40.6.B).

As discussed above under the NRHP and CRHR evaluation criteria, the Water Tank has been significantly altered since its construction circa 1915. Despite its deteriorated integrity, however, the Water Tank itself remains visible above its base and functions as a visual landmark to the local community. As such, the Water Tank represents a "special element" of the City's cultural history. The Water Tank is the oldest remaining structure in the former Frank's Tannery area and is a vestige of Redwood City's historical creek-side industries. These early industries were important to the City's industrial and economic development and have a significant association with events in local history.

Due to its eligibility as a landmark under local criteria of the City's Historic Preservation Ordinance, the Water Tank is a "historical resource" as defined in CEQA Guidelines Section 15064.5(a)(4).

(2) Archaeological Resources and Human Remains. No pre-contact archaeological deposits or associated human remains are recorded at the project site. The project site is situated at the historic extent of the San Francisco Bay and estuary, and surface or near-surface pre-contact archaeological deposits are not anticipated. Buried, Holocene-age stable surfaces underlying Bay Mud may contain pre-contact archaeological deposits and associated remains. Geotechnical coring at the project site determined that Bay Mud underlies the project site to a depth of 10 to 13 feet below

ground surface.¹⁶ Project excavation would not exceed 10 feet in depth, and as such, there is a low potential for encountering buried pre-contact archaeological deposits and associated human remains in the fill and Bay Mud within the area of project ground disturbance.

The NWIC database indicates that there is one previously recorded historic-period archaeological deposit at the project site. This resource is described below.

Frank Tannery’s Sheet Scatter (P-41-002393). “Frank Tannery’s Sheet Scatter” (P-41-002393)¹⁷ is a historic-period archaeological deposit that was identified during archaeological monitoring of a trench excavated for a 48-inch force-main installation.¹⁸ This site consists of a 2- to 12-inch thick layer of leather scraps, glass, and ceramic artifacts located 3 to 3.5 feet below the current ground surface. These materials were likely deposited during a single event or over a short period of time on Bay Mud or fill. Based on bottle manufacturing characteristics, the deposit may date from the 1910-20s.

An evaluation of the site’s eligibility for listing in the CRHR indicates that the portion of P-41-002393 identified during archaeological monitoring in 2014 is not eligible under any criteria for listing; it is not associated with an important person, event, nor were there any significant architectural features identified. This portion of the site also has no data potential as it lacks sufficient quantities of artifacts to accurately determine its age and to address important research themes.¹⁹

The record of Frank Tannery’s Sheet Scatter indicates that the layer of historic trash “extends beyond these linear [trench] boundaries in all directions.” As such, the full extent of this site has not been documented, and it is likely that additional, unevaluated portions of this archaeological deposit exist in the project site. Previous cultural resource investigations of the project site have recommended archaeological monitoring to identify and evaluate, as appropriate, any intact portions of Frank Tannery’s Sheet Scatter.^{20, 21}

(3) Paleontological Resources. The project site is situated on artificial fill overlying Holocene Bay Mud.^{22, 23} While the Bay Mud may contain a variety of marine invertebrate remains and organic matter (mollusks, clams, foraminifera, microorganisms, etc.), such remains are not fossilized and would not be considered significant or unique. For these reasons, the paleontological potential of the project site is low, and there are no known fossil localities at the project site.

¹⁶ EN GEO, 2017, op. cit.

¹⁷ This “Primary number” is the unique identifier assigned to this resource by the NWIC.

¹⁸ Psota, 2015, op. cit.

¹⁹ Psota, 2015:4

²⁰ Psota, 2015:4

²¹ Wohlgemuth and Kaijankoski, 2016:46

²² Brabb, E.E., R.W. Graymer, and D.L. Jones, 2000, op. cit.

²³ EN GEO, 2017, op. cit.

2. Impacts and Mitigation Measures

The following section describes potentially significant project impacts to cultural resources. This section first lists the criteria by which significance is determined, followed by a discussion of impacts. As previously noted, potential impacts associated with implementation of both the proposed project and the project variant would be similar with respect to cultural resources and are not differentiated in this section.

a. Criteria of Significance. Appendix G of the *CEQA Guidelines* provides that a project may have a significant impact on cultural resources if it would:

- Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5;
- Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to CEQA Guidelines Section 15064.5;
- Directly or indirectly destroy a unique paleontological resources or site or unique geologic feature; or
- Disturb any human remains, including those interred outside of formal cemeteries.

b. Project Impacts. The following discussion describes the project's potential impacts to cultural resources according to the significance criteria described above.

For the project to have “a substantial adverse change” on a historical resource, it would have to demolish, destroy, relocate, or alter the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired (CEQA Guidelines Section 15064.5(b)). Archaeological sites may qualify as historical resources under CEQA (CEQA Guidelines Section 15064.5(c)(1)).

Generally, for purposes of CEQA, the significance of a historical resource is materially impaired when a project demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for inclusion in, the CRHR or an officially recognized local register of historical resources, or its identification in a historical resources survey meeting the requirements of PRC Section 5024.1(g).

(1) Historical Resources. Development of either the proposed project or the project variant would result in a potentially significant impact on built-environment historical resources and archaeological historical resources, as described below.

Built-Environment Historical Resources. The project site includes the Water Tank, a circa 1915 structure. As described above, the Water Tank was recently evaluated for its eligibility for listing in the NRHP, CRHR, and for City landmark designation.²⁴ The Water Tank is the oldest remaining structure in the area and has a significant association with Redwood City's redwood

²⁴ ESA, 2016, op cit.

lumber shipping industry. However, due to extensive modifications to the historical structure, the Water Tank does not retain the integrity necessary to qualify for listing in either the NRHP or CRHR.

Consistent with the City's Historic Preservation Ordinance—and unlike the requirements for listing in the NRHP and CRHR—a loss of integrity does not prevent the City from designating a historic site as a local landmark. The Water Tank appears eligible for City landmark designation as a “special element” of the City's cultural history and for its significant association with Frank's Tannery.

Due to its eligibility as a landmark under criteria of the Historic Preservation Ordinance, the City considers the Water Tank a “historical resource” as defined in CEQA Guidelines Section 15064.5(a)(4).

The proposed project would result in dismantling of the Water Tank and relocation of the structure to City-owned property located near the waterway within the Inner Harbor area, per the proposed Development Agreement (refer to Chapter III, Project Description). The exact location is currently unknown at this time; however, it is anticipated that the dismantled Water Tank would be stored on City property within the vicinity until such time that nearby open space areas are developed. The Water Tank would then be relocated to these areas.

Removal of the Water Tank to an alternate site has the potential to significantly impact the structure, resulting from inadvertent damage during its disassembly, transport, storage, and reassembly at its new location. Furthermore, removal of the Water Tank from its current site would result in impacts to the structure's historical location and setting along Redwood Creek.

Impact CUL-1: Removal and relocation of the Water Tank would have a substantial adverse change on an eligible City landmark that qualifies as a historical resource, as defined in CEQA Guidelines Section 15064.5. (S)

As detailed in Chapter III, Project Description, the Water Tank would be removed from its current location and reconstructed at nearby City-owned property without the lower building, which is a non-historic addition to the structure constructed in the 1960s. The following mitigation measure shall be undertaken prior to, during, and after the Water Tank's relocation. Implementation of this mitigation measure would reduce the project's potential impacts to built-environment historical resources to a less-than-significant level. The Water Tank would be documented prior to its removal, and this documentation would be made publicly available at a local historical archive. Furthermore, a historic preservation architect and structural engineer would oversee the Water Tank's relocation to ensure that the potential for damage is minimized and that the structure's surviving historical materials and design are maintained at its new location.

Mitigation Measure CUL-1: The project applicant shall be responsible for funding all of the measures outlined below regarding relocation of the Water Tank. These measures shall be completed prior to, during, and after relocation of the Water Tank, as applicable.

The following tasks shall be undertaken prior to the Water Tank's relocation:

- Photo documentation of the Water Tank shall be completed prior to its removal from the project site. The photography shall be done to Historic American Building Survey-like standards. The photo documentation shall be filed with the Redwood City Public Library History Room/Vollmayer Archives.
- A qualified preservation architect and structural engineer/contractor shall prepare a Relocation Plan that:(1) describes the specific approach to dismantling the metal tank from the wood base, and any other portions of the tank; (2) describes how the receiver location will be prepared to accept the tank, including but not limited to grading and construction of the foundation; proposed travel route from the existing location to the new location; (3) delineates the historic features of the tank, specifying features that cannot be repaired, are deteriorated or damaged beyond repair; and (4) describes a permanent commemorative photographic display to be incorporated in the relocated Water Tank.
- The Relocation Plan and documentation shall be submitted for review and shall be approved by the City of Redwood City Planning Division prior to the removal of the Water Tank.

The following tasks shall be undertaken during and after the Water Tank's relocation:

- The relocation shall be implemented in accordance with the approved Relocation Plan and all required City noticing and permitting requirements.
- The Water Tank shall be reconstructed near the shoreline, consistent with the original historic setting of the structure.
- The Water Tank shall be properly placed and secured on permanent footings or foundation.
- Reconstruction or repair of the Water Tank shall not materially impair or visually obscure the historic features of the structure.
- A qualified preservation architect and structural engineer/contractor shall oversee reconstruction of the Water Tank at its new location to ensure that the work is done in accordance with the Relocation Plan. (LTS)

Archaeological Historical Resources. "Frank Tannery's Sheet Scatter" (P-41-002393), a circa 1910-20s subsurface trash deposit characterized by a layer of leather scraps, glass, and ceramics, is recorded at the project site. P-41-002393 includes trash associated with Frank's Tannery Site and, possibly, other unrelated domestic trash deposited at this location. Although the portion of P-41-002393 identified during archaeological monitoring does not appear to be a CEQA historical resource due to a lack of significant historical associations,²⁵ the physical extent of the archaeological deposit has not been defined. Significant, intact portions of P-41-002393 that qualify as CEQA historical resources due to their eligibility for listing in the CRHR may be buried at the project site.

²⁵ Psota, 2015, op. cit.

Impact CUL-2: Ground-disturbing activities occurring with development of both the proposed project and the project variant could have a substantial adverse change on archaeological deposits that qualify as historical resources, as defined in CEQA Guidelines Section 15064.5, and could materially impair historic-period archaeological deposits. (S)

As detailed in Chapter III, Project Description, approximately 14,350 cubic yards of soil would be excavated from the site to a maximum depth of 10 feet for utility trenching and installation of a shallow foundation system. This ground disturbance has the potential to unearth historic-period archaeological deposits associated with P-41-002393 and the historic tannery operations that occurred at the project site and vicinity. Should project excavation unearth intact archaeological deposits, a substantial adverse change to a historical resource may occur if CRHR-eligible deposits are partially or completely destroyed. This destruction would undermine the integrity of the resource such that it would no longer be eligible for listing in the CRHR.

Collectively, implementation of the following mitigation measures would reduce the project's potential impacts to archaeological historical resources to a less-than-significant level. On-site monitoring of ground disturbance by an archaeologist and work stoppage in the event of an archaeological discovery would ensure that if archaeological cultural resources are identified during excavation, these would be evaluated, documented, and studied in accordance with standard archaeological practice.

Mitigation Measure CUL-2a: Prior to project ground disturbance, all construction contractor(s) responsible for overseeing and operating ground-disturbing mechanical equipment (e.g., on-site construction managers and backhoe operators) shall be alerted to the sensitivity of the project site for buried archaeological deposits. A qualified archaeologist that meets the Secretary of the Interior's Professional Qualifications Standards for Historic Archeology shall conduct a "tailgate presentation" to alert relevant construction personnel of the appropriate procedures that should be undertaken if archaeological deposits are encountered during construction.

Mitigation Measure CUL-2b: All ground disturbance activities at the project site shall be monitored by an archaeologist that meets the Secretary of the Interior's Professional Qualifications Standards for Historic Archaeology. Monitoring shall continue at this location until the archaeologist determines that there is a low potential for subsurface archaeological deposits.

Should an archaeological deposit be encountered during project subsurface construction, all ground-disturbing activities within 25 feet shall be redirected and the on-site archaeologist shall assess the deposit, consult with agencies as appropriate, and make recommendations for the treatment of the discovery. The City shall be notified by the construction contractor within 24 hours of the encounter. If found to be significant by the on-site archaeologist (i.e., eligible for listing in the California Register of Historical Resources), the archaeologist shall prepare a Treatment Plan that describes the measures proposed for reducing impacts to the archaeological deposit. The City of Redwood City Planning and Housing Division shall review the Treatment Plan for adequacy prior to its implementation. Mitigation measures proposed in the Treatment Plan may include, but would not be limited to, recording the archaeological deposit, data recovery and laboratory analysis of recovered archaeological materials, and public outreach. No project ground disturbance shall occur within at least 25 feet of an archaeological historical

resource until a qualified archaeologist records and removes the deposit, consistent with the provisions of the Treatment Plan. The applicant shall be responsible for funding implementation of appropriate mitigation measures, and the City shall be responsible for monitoring implementation of the mitigation measures.

Upon completion of the selected mitigations, a report documenting the methods and findings shall be prepared and submitted to the City for review, which shall ensure that the provisions of the Treatment Plan have been met. The final report shall be submitted to the Northwest Information Center at Sonoma State University. Significant archaeological materials shall be submitted to an appropriate local curation facility and used for future research and public interpretive displays, as appropriate.

Mitigation Measure CUL-2c: Should an archaeological deposit be encountered during project subsurface construction activities when an archaeological monitor is not on site, all ground-disturbing activities within 25 feet shall be redirected and a qualified archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for Historic Archeology contacted to assess the situation, determine if the deposit qualifies as a historical resource, consult with agencies as appropriate, and make recommendations for the treatment of the discovery. If the deposit is found to be significant (i.e., eligible for listing in the California Register of Historical Resources), the applicant shall be responsible for funding and implementing appropriate mitigation measures. Mitigation measures may include recordation of the archaeological deposit, data recovery and analysis, and public outreach regarding the scientific and cultural importance of the discovery. Upon completion of the selected mitigations, a report documenting methods, findings, and recommendations shall be prepared and submitted to the City for review, and the final report shall be submitted to the Northwest Information Center at Sonoma State University. Significant archaeological materials shall be submitted to an appropriate local curation facility and used for future research and public interpretive displays, as appropriate. (LTS)

(2) Archaeological Resources. According to the CEQA Guidelines, “When a project will impact an archaeological site, a lead agency shall first determine whether the site is an historical resource” (CEQA Guidelines Section 15064.5(c)(1)). Those archaeological sites that do not qualify as historical resources shall be assessed to determine if these qualify as “unique archaeological resources” (California PRC Section 21083.2). Archaeological cultural resources identified during project construction shall be treated by the lead agency—in consultation with a qualified archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for Historic Archeology—in accordance with Mitigation Measures CUL-2b and CUL-2c.

(3) Paleontological Resources. The project site is situated on artificial fill overlying Holocene Bay Mud. Holocene Bay Mud is too recent to contain scientifically important fossils, and project excavation would not extend below this geologic deposit. The project would have no impact on unique paleontological resources or a unique geological feature.

(4) Human Remains. Pre-European contact archaeological sites in the Bay Area are known to contain Native American skeletal remains. Background research conducted for this EIR at the NWIC did not identify recorded Native American skeletal or cremated remains at or adjacent to the project site.

Although no human remains have been identified at the project site, there is a remote possibility of encountering disarticulated remains in redeposited artificial fill underlying the project site. Such remains could be uncovered during project ground-disturbing activities.

If human remains are identified during project construction, Section 7050.5 of the California Health and Safety Code and Section 5097.98 of the Public Resources Code would apply, as appropriate. With these regulations in place, no impact on human remains is anticipated, and no mitigation is necessary.

c. Cumulative Impacts. For cultural resources, the scope for assessing cumulative impacts encompasses other past, current, or probable future projects under City review. The project would have a significant effect on the environment if it—in combination with other projects—would contribute to a significant cumulative impact on cultural resources. For purposes of this analysis, growth assumed for the project area consistent with buildout of the General Plan was used to identify probable future development within the vicinity of the project site. This approach is more fully described in Section IV, Setting, Impacts and Mitigation Measures of this EIR.

The proposed project would have no impact on paleontological resources or human remains. The project, therefore, would not combine with the effects of other projects in the vicinity to contribute to a significant cumulative impact on these resource types.

The project could result in a potentially significant impact on built-environment historical resources and archaeological historical resources that may be buried at the project site and unearthed during construction. However, impacts on historical built-environment and archaeological resources accidentally discovered during project ground disturbance would be mitigated to a less-than-significant level with appropriate mitigation measures adopted as conditions of approval. Similarly, recent past, approved, and probable future projects that may occur in the vicinity in association with the development and growth projections outlined in the General Plan—including the proposed project—would not result in a cumulative increase in impacts on historical built-environment resources, as impacts to any such resources would be individually addressed and mitigated or historical archaeological resources, archaeological resources, paleontological resources, or human remains, as these resources would be avoided or otherwise removed, analyzed, and reported (i.e., by a qualified archaeologist).

When future development proposals are considered by the City, these proposals would undergo environmental review pursuant to CEQA, and when necessary, mitigation measures would be adopted as appropriate. In most cases, this environmental review and compliance with project conditions of approval, relevant policies and mitigation measures of applicable Precise Plans (e.g., the Downtown Precise Plan and Stanford in Redwood City Precise Plan), the General Plan, and Chapter 40 of the City's Municipal Code would ensure that significant impacts on cultural resources would be avoided or otherwise mitigated to less-than-significant levels.

For these reasons, the proposed project would not result in or contribute to any significant cumulative impacts on archaeological deposits, paleontological resources, human remains, or built-environment historical resources and cumulative impacts to cultural resources would be less than significant.

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D. TRANSPORTATION AND CIRCULATION

This section describes existing and projected future transportation conditions within the project site vicinity, identifies the potential impacts of the project, and recommends mitigation measures for identified significant impacts. The analysis methodology, environmental setting, and regulatory setting are described in the following sections.

As described in Chapter III, Project Description, the project as proposed includes a partial Blomquist Street Extension to Maple Street. The project variant includes a partial Blomquist Street Extension to Redwood Creek. While trip generation and most transportation issues would be the same with the project and the project variant, project site access would slightly change and these differences and associated impacts are discussed in this section, as appropriate.

1. Analysis Scope and Methodology

The analysis scope presented in this chapter and all methodologies herein were reviewed and approved by Redwood City staff. Some of the analysis presented within this chapter relies on methodologies and assumptions previously approved by the City for the Inner Harbor Specific Plan (IHSP) Draft Environmental Impact Report (DEIR). The following subsections outline the analysis approach for traffic operations. The approach for other transportation issues are presented later in this section.

a. Study Locations. This section evaluates the impacts of the project on key roadway facilities, including eight intersections, three freeway segments, and freeway ramps at two interchanges. The study area for the traffic analysis was selected based on local traffic patterns, input from local authorities, and engineering judgment, to capture the transportation facilities where motorists are likely to experience impacts due to buildout of the project. The study intersections and freeway mainline segments and ramps are listed below and shown on Figure IV.D-1. All study intersections are controlled by a traffic signal unless noted.

Study Intersections:

1. Veterans Boulevard/Whipple Avenue
2. Whipple Avenue/US 101 Northbound Off-Ramp
3. East Bayshore Road/Bair Island Road (Roundabout)
4. Maple Street/Veterans Boulevard
5. Blomquist Street/Maple Street (Side-street Stop Controlled)
6. Broadway/Woodside Road (State Route 84)/US 101 Southbound Off-Ramp
7. Veterans Boulevard/Woodside Road (SR 84)/US 101 Southbound On-Ramp
8. Blomquist Street/Seaport Boulevard/East Bayshore Road

Freeway Segments:

- A. US 101 from Marsh Road to Woodside Road (SR 84)
- B. US 101 from Woodside Road (SR 84) to Whipple Avenue
- C. US 101 from Whipple Avenue to Holly Street

Freeway Ramps

- US 101/Whipple Avenue on/off ramps
- US 101/Woodside Road – Seaport Boulevard (SR 84) on/off ramps

b. Data Collection. Intersection vehicle turning movement (passenger and truck), pedestrian, and bicycle counts were conducted during the morning (7:00 a.m. to 9:00 a.m.) and evening (4:00 p.m. to 6:00 p.m.) peak periods, on typical weekdays while local schools were in session. Counts were conducted in April and May 2017.

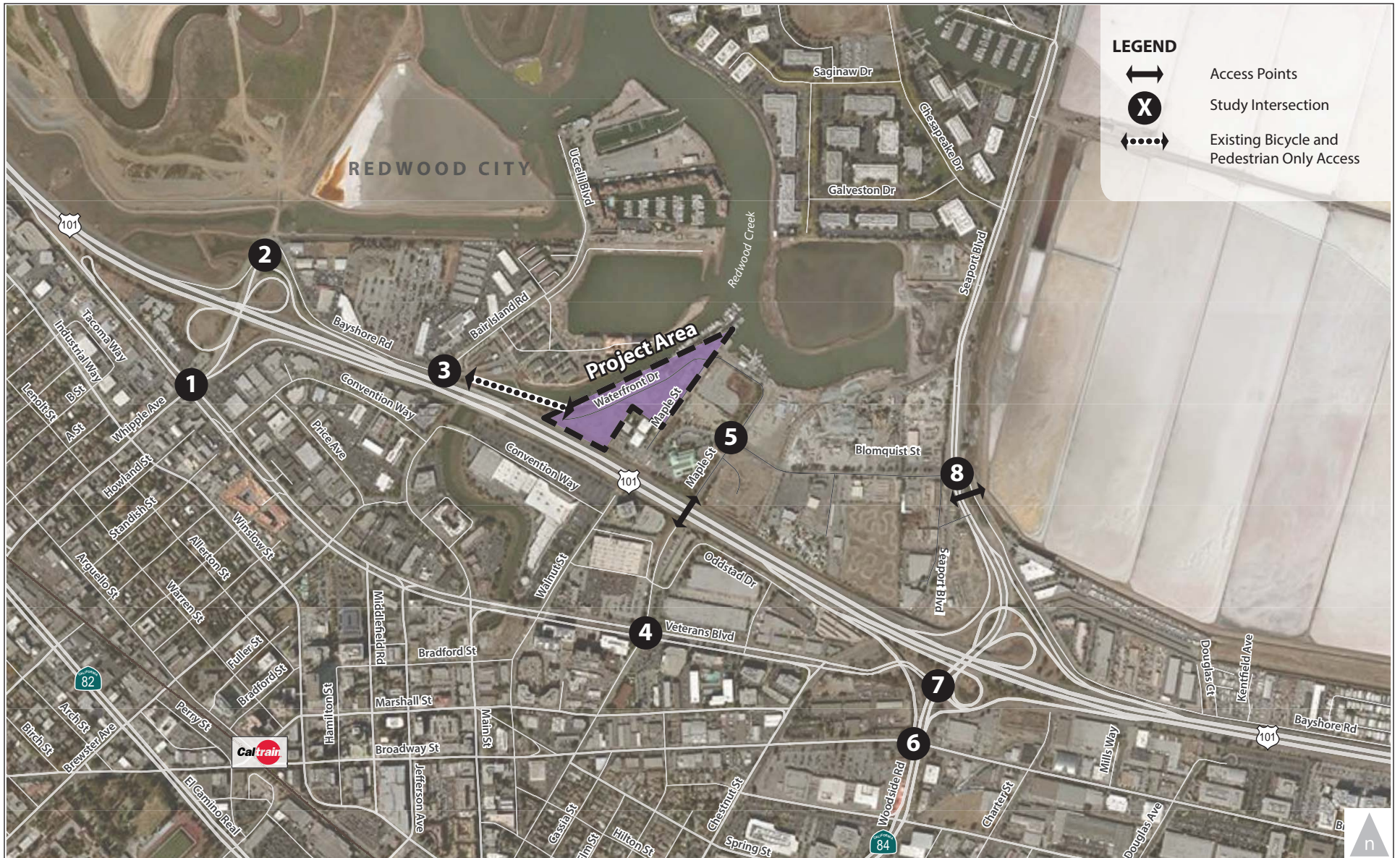
Field observations were conducted in May 2017 to confirm additional information regarding traffic control, existing lane configurations, posted speed limits, truck behavior, freeway bottleneck locations, and freeway and local roadway queuing.

c. Site Access. Direct access to the project site would be provided via Maple Street. As part of the proposed project, the portion of Maple Street adjacent to the project site would be reconfigured in order to accommodate perpendicular on-street parking and internal access. The site plan also accommodates for an extension of Blomquist Street to Maple Street. All internal and new streets would be required to comply with the City’s standards for public streets. Site access for the project variant would be similar to that of the project except additional access would be provided via the partial Blomquist Street Extension to Redwood Creek.

d. Analysis Methodologies. Potential roadway system impacts resulting from the project have been evaluated, and presented herein, following methodologies and standards commonly applied by the City in accordance with traffic planning and engineering practice, and in accordance with the guidelines and policies of the San Mateo City/County Association of Governments (C/CAG), which is the Congestion Management Agency (CMA) for the County.

Evaluation of traffic conditions on local streets involves analysis of intersection operations, as intersections represent the locations where the roadway capacity is most constrained. Intersection and freeway mainline segment operations were evaluated with level of service calculations. Level of service (LOS) is a qualitative description of operations ranging from LOS A, when the roadway facility has excess capacity, and motorists experience little or no delay, to LOS F, where the volume of vehicles exceeds the capacity, resulting in long queues and excessive delays. Typically, LOS E represents “at-capacity” conditions, and LOS F represents “over-capacity” conditions. At signalized intersections operating at LOS F, for example, drivers may have to wait through multiple signal cycles.

This LOS system applies to signalized and unsignalized intersections, as well as freeway mainline segments and ramps. LOS A, B, and C are generally considered satisfactory service levels, while the influence of congestion becomes more noticeable (though still considered acceptable) at LOS D. LOS E and F are generally considered to be unacceptable. The City has established a maximum acceptable operating level of LOS D for signalized and unsignalized intersections in all areas of the city, except the Downtown area, as defined by the Downtown Precise Plan, and some intersections in the congestion management program network. The LOS threshold for all project study intersections is LOS D.



LSA

FIGURE IV.D-1

1548 Maple Street Project EIR

Project Area and Study Intersection Locations

SOURCE: FEHR & PEERS, NOVEMBER 2017

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For CEQA purposes, a freeway segment is considered to operate at an acceptable level if the segment operates at or better than the level of service standard identified for that segment by the County congestion management agency. C/CAG's level of service standards for the study freeway segments are LOS E for US 101 from SR 92 to Whipple Avenue, and LOS F for US 101 from Whipple Avenue to the Santa Clara County line. C/CAG does not provide thresholds for acceptable freeway ramp operations; however, Redwood City considers ramps operating at less than their capacity (e.g. less than a volume to capacity ratio of 1.00) to be acceptable.

California Senate Bill 743 (SB 743) was recently adopted to change the way that transportation impacts are analyzed under CEQA. Under SB 743, the Office of Planning and Research (OPR) is tasked with developing new criteria for determining the significance of transportation impacts, which may include, but are not limited to, "vehicle miles traveled, vehicle miles traveled per capita, automobile trip generation rates, or automobile trips generated."¹ Once the guidelines are prepared and certified by the Secretary of the Natural Resources Agency, "automobile delay, as described solely by level of service of similar measures of vehicular capacity or traffic congestion, shall not be considered a significant impact on the environment."² In November 2017, OPR released their proposed updates to the CEQA Guidelines. However, since OPR has not yet amended the CEQA Guidelines to implement this change, automobile delay is still considered a potential significant impact, and the City will continue to use the above-described established LOS criteria for its CEQA analyses.

All of the study intersections were evaluated using the Synchro/SimTraffic 9 software package, which incorporates the methods presented in the 2010 Highway Capacity Manual (HCM), specifically Chapters 18 (Signalized Intersections), 19 (Two-Way Stop Controlled Intersections), and 20 (Roundabouts). The intersections of Whipple Avenue/Veterans Boulevard, Whipple Avenue/US 101 Northbound Off-Ramp, and East Bayshore Road/Bair Island Road (Roundabout) were analyzed using Synchro, which evaluates the operations of intersections that function independently. The remaining intersections overlap with the US 101/SR 84 (Woodside Road) Interchange Improvement Project³ and were evaluated with SimTraffic, the micro-simulation portion of the software package. SimTraffic accounts for the interactions and vehicle queues that may extend between these intersections, affecting operations at adjacent intersections. Freeway analysis was conducted according to the methodology adopted by C/CAG. Each analysis method is briefly described below.

(1) Signalized Intersections. The method from Chapter 18 of the HCM bases a signalized intersection's operation on the average control delay experienced by motorists traveling through it. Control delay incorporates the vehicle delay associated with deceleration, stopping, moving up in the queue, and acceleration. This method uses various intersection characteristics (such as traffic volumes, lane geometry, and signal phasing/timing) to estimate the average control delay. Table IV.D-1 summarizes the relationship between average delay per vehicle and LOS for signalized intersections according to the 2010 HCM method.

¹ Public Resources Code section 21099(b)(1).

² Public Resources Code section 21099(b)(2).

³ For more information on the US 101/SR 84 (Woodside Road) Interchange Improvement Project see: www.redwoodcity.org/departments/community-development-department/engineering-transportation/transportation-parking/I01-woodside-interchange.

Table IV.D-1: Signalized Intersection LOS Criteria

| Level of Service | Description | Average Control Delay Per Vehicle (Seconds) |
|------------------|---|---|
| A | Operations with very low delay occurring with favorable progression and/or short cycle length. | ≤ 10 |
| B | Operations with low delay occurring with good progression and/or short cycle lengths. | > 10 and ≤ 20 |
| C | Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear. | > 20 and ≤ 35 |
| D | Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable. | > 35 and ≤ 55 |
| E | Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay. | > 55 and ≤ 80 |
| F | Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths. | > 80 |

Source: Transportation Research Board, 2010. *2010 Highway Capacity Manual*.

(2) Unsignalized Intersections. Traffic conditions at the unsignalized study intersections (two-way stop-controlled intersections and roundabouts) were evaluated using the method from Chapters 19 and 20 of the 2010 HCM. With this method, operations are defined by the average control delay per vehicle (measured in seconds) for each stop-controlled movement or movement that must yield the right-of-way. At two-way stop-controlled intersections, the movement with the highest delay and corresponding LOS is reported. Table IV.D-2 summarizes the relationship between delay and LOS for unsignalized intersections. Generally, the delay ranges for each LOS are lower than for signalized intersections because drivers expect less delay at unsignalized intersections.

Table IV.D-2: Unsignalized Intersection LOS Criteria

| Level of Service | Description | Average Control Delay Per Vehicle (Seconds) |
|------------------|--|---|
| A | Little or no traffic delays | ≤ 10 |
| B | Short traffic delays | > 10 and ≤ 15 |
| C | Average traffic delays | > 15 and ≤ 25 |
| D | Long traffic delays | > 25 and ≤ 35 |
| E | Very long traffic delays | > 35 and ≤ 50 |
| F | Extreme traffic delays with intersection capacity exceeded | > 50 |

Source: Transportation Research Board, 2010. *2010 Highway Capacity Manual*.

(3) Freeway Operations. Freeway mainline and ramp operations were evaluated using methods adopted by C/CAG, the 2000 HCM volume-to-capacity ratio method. The level of service description and the maximum volume-to-capacity ratio for each LOS designation are presented in Table IV.D-3.

Table IV.D-3: Freeway LOS Criteria

| Level of Service | Description | Maximum Volume to Capacity Ratio (V/C) |
|------------------|---|--|
| A | Free flow operations with average operating speeds at, or above, the speed limit. Vehicles are unimpeded in their ability to maneuver. | 0.30 |
| B | Free flow operations with average operating speeds at the speed limit. Ability to maneuver is slightly restricted. Minor incidents cause some local deterioration in operations. | 0.50 |
| C | Stable operations with average operating speeds near the speed limit. Freedom to maneuver is noticeably restricted. Minor incidents cause substantial local deterioration in service. | 0.71 |
| D | Speeds begin to decline slightly with increasing flows. Freedom to maneuver is more noticeably restricted. Minor incidents create queuing. | 0.89 |
| E | Operations at capacity. Vehicle spacing causes little room to maneuver but speeds exceed 50 miles per hour (mph). Any disruption to the traffic stream can cause a wave of delay that propagates throughout the upstream traffic flow. Minor incidents cause serious breakdown of service with extensive queuing. Maneuverability is extremely limited. | 1.00 |
| F | Operations with breakdowns in vehicle flow. Volumes exceed capacity causing bottlenecks and queue formation. | N/A |

Source: Transportation Research Board, 2010. *2010 Highway Capacity Manual*.

e. **Analysis Scenarios.** The operations of the study intersections and the freeway segments and ramps were evaluated during the time periods when traffic volumes are highest, i.e., during the one hour when morning and evening traffic is highest between 7:00 to 9:00 a.m. and 4:00 to 6:00 p.m., respectively. The operations of these facilities were evaluated for the following scenarios for the project:

- **Existing** – Existing traffic demand volumes on local roads and freeway segments/ramps, based on counts collected in 2017.
- **Existing Plus Project** – Existing traffic demand volumes plus new traffic from the project analyzed with the existing roadway network. The project and project variant are both modeled under this scenario.
- **Cumulative (2040) No Project** – Projected conditions in 2040 without the project, including additional land use and the buildout of the proposed roadway network (including the Full Blomquist Street Extension to East Bayshore Road) as included in the General Plan buildout.
- **Cumulative (2040) Plus Project** – Projected conditions in 2040 with the proposed project. The project and project variant are the same in this scenario.

2. Setting

The existing conditions for vehicles, transit, bicycles, and pedestrians within the vicinity of the site are presented below.

- a. **Roadway Network.** The existing roadway network in the vicinity of the project site, including regional and local roadways, is described below.

(1) **Regional Roadways.** US Highway 101 is a major regional freeway serving Redwood City and the west coast of the United States. US 101 generally runs north-south, but has an east-west alignment through Redwood City. For the purpose of this study, US 101 is described using northbound and southbound directions to be consistent with the regional role that US 101 provides. The freeway extends northward from Redwood City through San Francisco and southward through San Jose. In Redwood City, US 101 is located on the east side of the City and generally provides four mixed-flow lanes⁴ in each direction. Access to the project site is provided from US 101 via the interchange at Seaport Boulevard/Woodside Road (SR 84). After the completion of the proposed Blomquist Street Extension to Bair Island Road, secondary access to the project will be provided via the Whipple Avenue interchange to the northwest of the site.

(2) **Local Roadways.** The local roadways described below provide essential access to and through the study area, or are part of the study intersections analyzed in this section.

- **Seaport Boulevard** runs from its interchange with US 101 and Woodside Road (SR 84) to the Pacific Shores business park at the northeastern terminus. Seaport Boulevard generally provides two travel lanes in each direction with protected left-turn lanes at key intersections. The posted speed limit on Seaport Boulevard is 35 miles per hour. A rail line runs parallel to Seaport Boulevard. Access to the project is provided via the signalized intersection with Blomquist Street.
- **Blomquist Street** runs for roughly a third of a mile from Seaport Boulevard to Maple Street. Blomquist Street provides one travel lane in each direction with unrestricted, on-street parallel parking on the south side of the street. There are Class II bicycle lanes (defined in the subsection below) in both directions and a five-foot-wide sidewalk on the south side of the street. The Redwood City Transportation Impact Mitigation Fee Program (TIF) includes the extension of Blomquist Street (west-northwest of Maple Street) to connect with the roundabout at Bair Island Road via a new bridge crossing over Redwood Creek. The posted speed limit on Blomquist Street is 25 miles per hour.
- **Maple Street** connects Downtown Redwood City to the project site by way of a crossing over US 101. Northeast of the overcrossing, Maple Street provides access to the Redwood City Police Department and the Maple Street Correctional Center. Maple Street provides one lane in each direction, with a paved shoulder and a four foot wide sidewalk on some segments. The street includes segments with limited lane striping and designated shoulders. The pavement is in disrepair and is in need of repaving and other general street maintenance. Maple Street is currently classified in the General Plan as a Bicycle Boulevard between Veterans Boulevard (south of US 101) and Blomquist Street. Bicycle Boulevards are through-routes for bicycles, providing connectivity with the area's bicycle route network. These roadways accommodate local vehicular traffic, but bicycles have priority in the event of conflicts. The posted speed limit on Maple Street is 30 miles per hour.

⁴ Mixed-flow lanes carry all vehicles, as opposed to High-Occupancy Vehicle Lanes, which carry only vehicles that meet carpool occupancy requirements (or in some cases emission-control requirements).

- **Veterans Boulevard** is an east-west divided arterial roadway of varying widths (number of lanes) between the US 101 off-ramp at Whipple Avenue at its western terminus and the US 101 on-ramp at Woodside Road (SR 84) at its eastern terminus. Veterans Boulevard generally has six lanes between Whipple Avenue and Main Street, four lanes between Main Street and Chestnut Street, and two lanes between Chestnut Street and Woodside Road. It has bike lanes and a posted speed limit of 35 miles per hour.
- **Broadway** is a two- to four-lane roadway that extends from Hopkins Avenue through Downtown Redwood City to 5th Avenue. Between Hopkins Avenue and El Camino Real, the roadway has two lanes and bike lanes on both sides of the street. Through Downtown, between El Camino Real and Spring Street, two vehicle lanes are maintained with no bicycle lanes. East of Spring Street, the cross-section of Broadway varies, widening to four lanes the majority of the time, with portions being two lanes with a two-way left turn lane. Bicycle facilities east of Spring Street include sharrows and discontinuous bike lanes between Chestnut Street and Charter Street and between 2nd Avenue and 5th Avenue. On-street parking is not permitted between Chestnut Street and Charter Street, between Douglas Avenue and Second Avenue, or through portions of Downtown. It has a posted speed limit of 30 miles per hour.

(3) Traffic Demand Volumes and Lane Configurations. The existing AM and PM peak-hour traffic demand volumes, lane geometries, and intersection controls for the study intersections are shown in Figure IV.D-2.⁵ Volumes presented on the figure for intersections analyzed with the Synchro analysis platform represent intersection peak hours. Volumes at intersections analyzed with the SimTraffic simulation platform represent the global peak hours, which correspond, to the hours between 7:45 and 8:45 a.m. during the morning and between 4:30 and 5:30 p.m. during the evening. The raw traffic count data are presented in Appendix C to this EIR.

The following were taken into consideration in establishing the peak-hour intersection demand volumes:

- Based on field observations, the queue lengths approaching the intersections at the beginning of the peak hour were similar to the queue lengths at the end of the peak hour, indicating that the traffic counts represent the demand volume for the selected peak hour.
- The Woodside Road off-ramp demand volumes at the intersections reflect the counted volume at the exit ramp gore point. The AM peak-hour demand volume at the off-ramps was set to be the average of the 7:00 to 8:00 a.m. and 8:00 to 9:00 a.m. hourly ramp counts, and the PM peak-hour demand volume was set to equal the 5:00 to 6:00 p.m. ramp count.
- Minor adjustments to the raw traffic counts to ensure balanced vehicle flows between adjacent intersections.

(4) Intersection Operations. As shown in Table IV.D-4, during the AM and PM peak hours, all intersections are operating at acceptable LOS, except the following:

⁵ This analysis used demand volumes to be consistent with the US 101/ SR 84 (Woodside Road) Interchange Improvement Project. Demand volumes can differ from counted volumes because they include vehicles that are waiting in a queue. For intersections operating at good LOS, with little to no queuing, demand volumes and counted volumes are synonymous. For intersections operating at LOS D, E, or F, with queuing, the demand volumes are slightly higher than the counted volumes.

1. Veterans Boulevard/Whipple Avenue – LOS E in the PM peak hour
6. Broadway/Woodside Road (SR 84)/US 101 Southbound On-Ramp – LOS F in the AM and PM peak hours
7. Veterans Boulevard/Woodside Road (SR 84)/US 101 Southbound On-Ramp– LOS F in the PM peak hour

Table IV.D-4: Existing Intersection Level of Service (LOS) Results

| Intersection | Traffic Control | AM Peak | | PM Peak | |
|---|-----------------|--------------------|----------|--------------------|----------|
| | | Delay ^a | LOS | Delay ^a | LOS |
| 1. Veterans Boulevard/Whipple Avenue | Signal | 37 | D | 62 | E |
| 2. Whipple Avenue/US 101 Northbound Off-Ramp | Signal | 14 | B | 17 | B |
| 3. East Bayshore Road/Bair Island Road/ | Roundabout | < 10 | A | < 10 | A |
| 4. Maple Street/Veterans Boulevard | Signal | 18 | B | 23 | C |
| 5. Blomquist Street/Maple Street | SSSC | < 10 | A | < 10 | A |
| 6. Broadway/Woodside Road (SR 84)/ US 101 Southbound Off-Ramp | Signal | > 80 | F | > 80 | F |
| 7. Veterans Boulevard/Woodside Road (SR 84)/ US 101 Southbound On-Ramp | Signal | 18 | B | > 80 | F |
| 8. Blomquist Street/Seaport Boulevard/ East Bayshore Road | Signal | 28 | C | 25 | C |

^a For signalized intersections and roundabouts, delay is the weighted average for all movements in seconds per vehicle. For side-street stop controlled (SSSC) intersections, delay is the worst-operating approach delay.

Bold = unacceptable LOS.

Source: Fehr & Peers, 2017.

(5) Freeway Volumes and Operations. Ramp and Mainline operations were studied in detail as part of the US 101/SR 84 (Woodside Road) Interchange Improvement Project. Ramp and mainline data from the following sources were reviewed:

- Ramp volumes from the Existing Conditions Report for the US 101/Holly Street Interchange Project;⁶
- Ramp volumes from intersection counts conducted April 2017; and
- Mainline counts obtained from the Performance Measurement System (PeMS) database (2014).⁷

Traffic volumes that represent a typical weekday were selected, and existing peak-hour traffic volumes on the study freeway segments and ramps are presented in Table IV.D-5 and Table IV.D-6, respectively. The freeway mainline segments and ramp junction operations were evaluated using a volume-to-capacity analysis. All freeway segments currently operate at or better than the Congestion Management Program (CMP) LOS standard. All ramps operate below capacity (LOS D or better).

⁶ Fehr & Peers, 2013. *U.S. 101/Holly Street Interchange Project Existing Conditions Report*. December.

⁷ The most recent PeMS volumes (2016) for relevant mainline locations were reviewed and were not substantially different from 2014 volumes (<10%). To maintain consistency with recently completed studies, 2014 volumes were used.

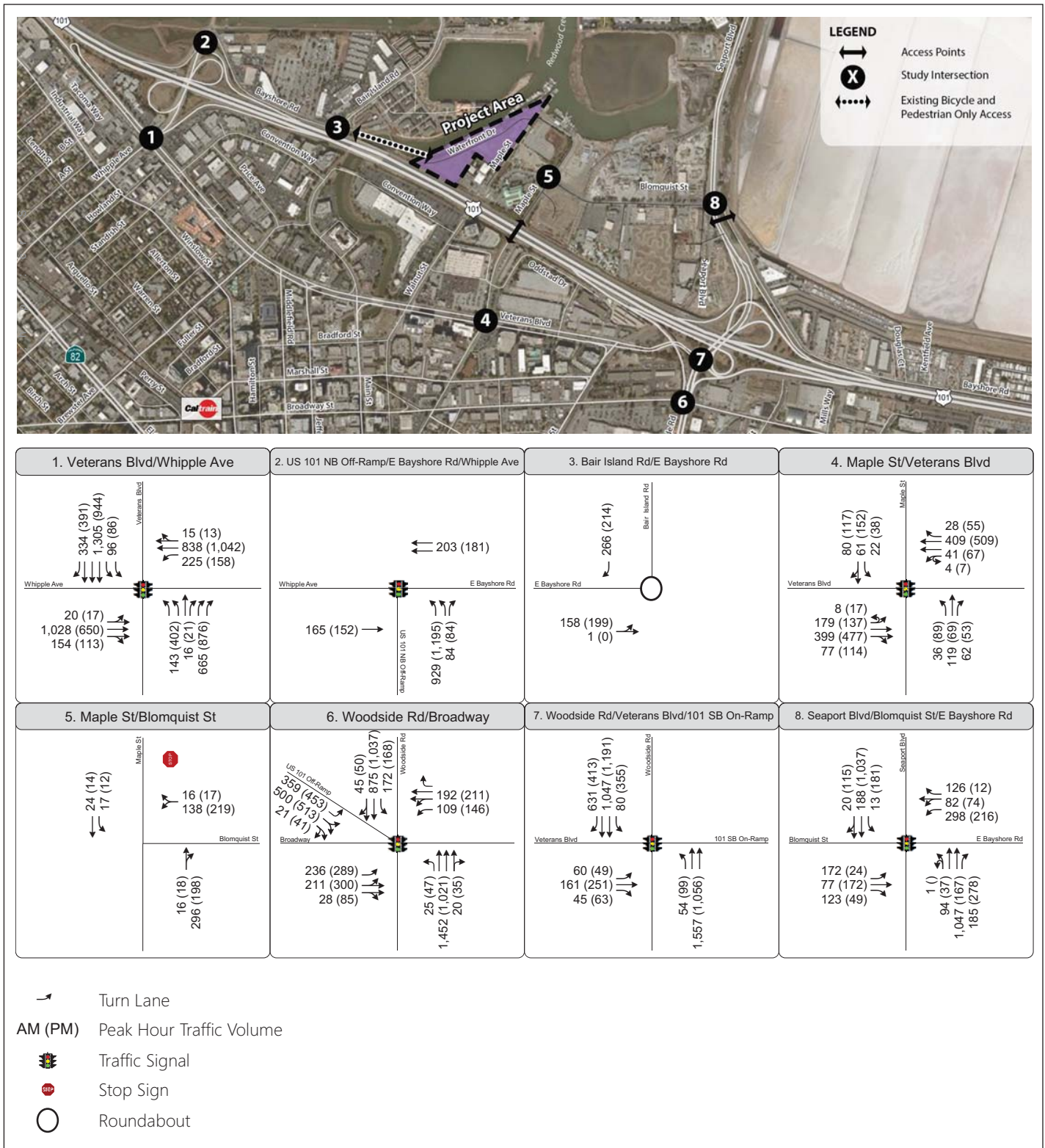


FIGURE IV.D-2



1548 Maple Street Project EIR

Existing Peak Hour Traffic Volumes and Lane Configurations

SOURCE: FEHR & PEERS, DECEMBER 2017.

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Table IV.D-5: Existing Freeway Segment Level of Service (LOS) Results

| Freeway Segment | CMP LOS Standard ^a | Peak Hour | Direction | Volume | V/C ^b | LOS |
|--|-------------------------------|-----------|-----------|--------|------------------|-----|
| A. US 101, Marsh Road to Woodside Road (SR 84) | F | AM | NB | 8,198 | 0.89 | E |
| | | PM | SB | 9,020 | 0.98 | E |
| | | AM | NB | 7,750 | 0.84 | D |
| | | PM | SB | 8,061 | 0.88 | D |
| B. US 101, Woodside Road (SR 84) to Whipple Avenue | F | AM | NB | 8,006 | 0.92 | E |
| | | PM | SB | 8,080 | 0.93 | E |
| | | AM | NB | 7,228 | 0.83 | D |
| | | PM | SB | 7,518 | 0.86 | D |
| C. US 101, Whipple Avenue to Holly Street | F | AM | NB | 8,502 | 0.98 | E |
| | | PM | SB | 7,797 | 0.90 | E |
| | | AM | NB | 7,159 | 0.82 | D |
| | | PM | SB | 7,778 | 0.89 | E |

^a Per C/CAG 2013 Congestion Management Program (CMP) Monitoring Report.

^b V/C = Volume-to-Capacity Ratio

Source: Fehr & Peers, 2017.

Table IV.D-6: Existing Freeway Ramp Level of Service (LOS) Results

| Freeway Interchange and Ramp | | Type | Capacity | Peak Hour | Volume | V/C ^a | LOS |
|------------------------------|--|----------------------|----------|-----------|--------|------------------|-----|
| US 101/Woodside Road | | | | | | | |
| Northbound | Off-Ramp to Woodside Road | Diagonal | 2,000 | AM | 1,719 | 0.86 | D |
| | | | | PM | 1,230 | 0.62 | C |
| | On-Ramp from Westbound Seaport Boulevard | Diagonal | 2,000 | AM | 264 | 0.15 | A |
| | | | | PM | 579 | 0.32 | B |
| | On-Ramp from Eastbound Woodside Road | Loop | 1,800 | AM | 1,093 | 0.61 | C |
| | | | | PM | 864 | 0.48 | B |
| Southbound | Off-Ramp to Eastbound Seaport Boulevard | Loop | 1,800 | AM | 526 | 0.29 | A |
| | | | | PM | 158 | 0.09 | A |
| | Off-Ramp to Westbound Woodside Road | Diagonal | 2,000 | AM | 884 | 0.44 | B |
| | | | | PM | 1,008 | 0.50 | C |
| | On-Ramp from Woodside Road | Diagonal | 2,000 | AM | 936 | 0.47 | B |
| | | | | PM | 1,240 | 0.62 | C |
| US 101/Whipple Avenue | | | | | | | |
| Northbound | Off-Ramp to Whipple Avenue | Diagonal | 2,000 | AM | 1,014 | 0.51 | C |
| | | | | PM | 1,282 | 0.64 | C |
| | On-Ramp from Eastbound Whipple Avenue | Loop | 1,800 | AM | 1029 | 0.57 | C |
| | | | | PM | 924 | 0.51 | C |
| | On-Ramp from Westbound Whipple Avenue | Diagonal | 900 | AM | 75 | 0.08 | A |
| | | | | PM | 69 | 0.08 | A |
| Southbound | Off-Ramp to Veterans Avenue/Whipple Avenue | Diagonal (Dual-Lane) | 3,800 | AM | 1,727 | 0.45 | B |
| | | | | PM | 1,355 | 0.36 | B |
| | On-Ramp from Westbound Whipple Avenue | Loop | 900 | AM | 54 | 0.06 | A |
| | | | | PM | 165 | 0.18 | A |
| | On-Ramp from Eastbound Whipple Avenue | Diagonal | 2,000 | AM | 595 | 0.30 | A |
| | | | | PM | 543 | 0.27 | A |

^a Theoretical capacities of off-ramps per Exhibit 25-3 of HCM 2000: 2,000 vehicles per hour (vph) for single-lane diagonal ramps, 1,800 vph for loop ramps, and 3,800 vph for dual-lane diagonal off-ramps. For on-ramps, capacities are based on existing meter rates for each lane by ramp.

^b V/C = Volume-to-Capacity Ratio

Source: Fehr & Peers, 2017.

b. Public Transit System. The City of Redwood City is served by two major transit providers: SamTrans and Caltrain. SamTrans provides local and regional bus service, and Caltrain provides commuter rail service. Local shuttles are also provided in Redwood City during commute hours by Caltrain and the Peninsula Traffic Congestion Relief Alliance. Transit service (bus routes, major bus stops and Caltrain service and station) is shown on Figure IV.D-3.

(1) SamTrans Bus Service. San Mateo County Transit District (SamTrans) operates bus service throughout San Mateo County, with more than 50 routes that are categorized as community, express, BART connection, Caltrain connection, and BART and Caltrain connection routes. Most bus routes typically operate along major arterial corridors and operate from early morning into the late evening.

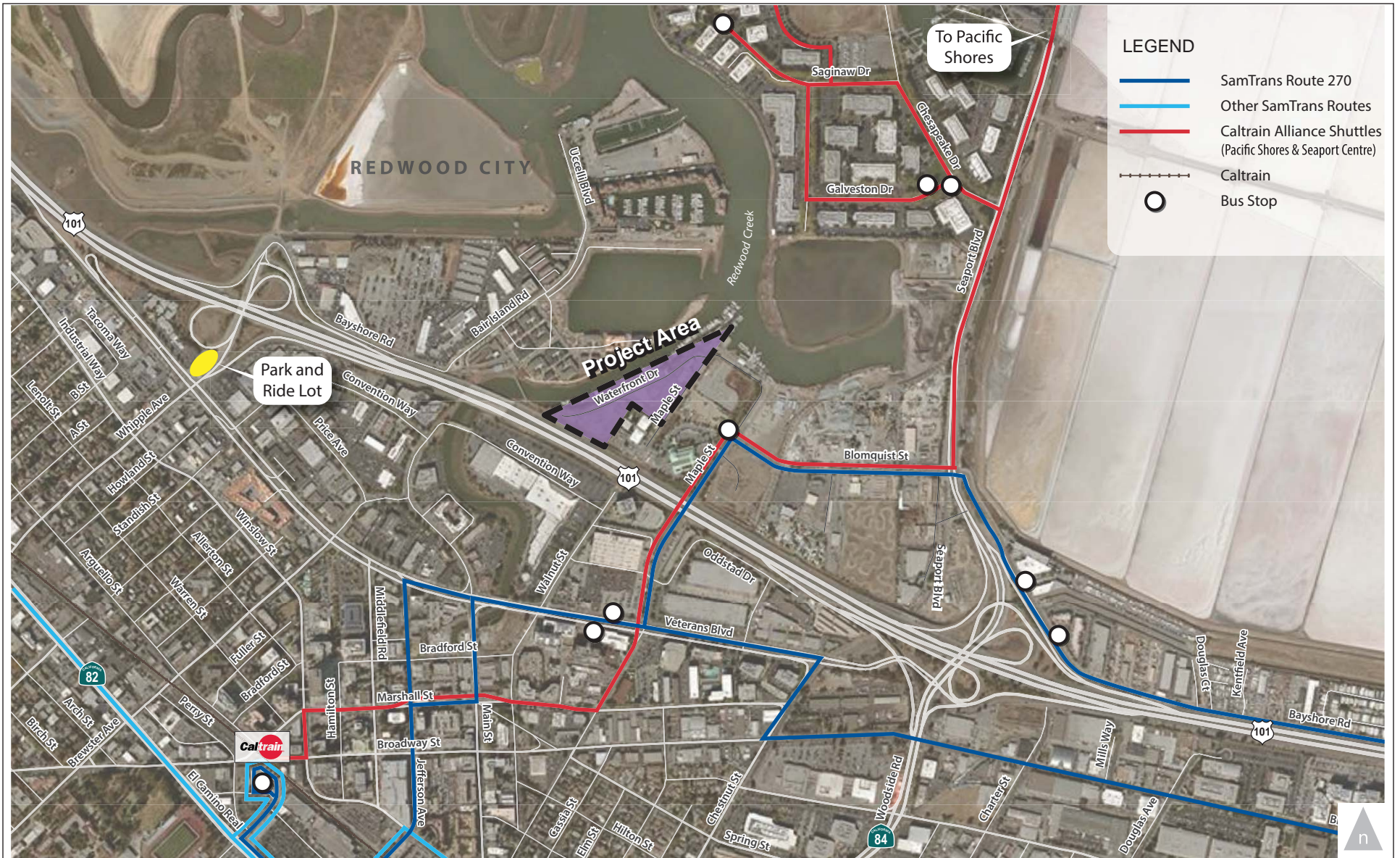
SamTrans Route 270 is currently the only bus route that serves the project site (via Maple Street and Blomquist Street), providing service between Redwood City Caltrain Station and Kaiser Hospital, Seaport Village, Harbor Village, and Marsh Road (Menlo Park). Headways (frequency of service) are every 60 minutes on weekdays between 6:00 a.m. and 6:00 p.m., as well as on Saturdays between 8:00 a.m. and 6:00 p.m. The bus stop serving the project is located within walking distance, approximately a quarter mile away at the intersection of Blomquist Street/Maple Street. Limited service is provided after 6:00 p.m. on weekdays, and no service is provided on Sundays. SamTrans Route 276 serves the same route as Route 270 south of the US 101 freeway. Therefore, since Route 276 does not travel along Bayshore Road and does not use the Maple Street and Blomquist Street stop, the route does not directly serve the project site. Routes 296, 297, 397, and ECR serve the Redwood City Caltrain Station and other destinations in Redwood City as well as outside the City; however, these routes do not provide direct service to the project site.

(2) Caltrain. Caltrain operates commuter rail service between San Francisco and San Jose, and limited service trains to Morgan Hill and Gilroy during weekday commute periods. On weekdays, Caltrain operates approximately 100 trains per day of local, limited stop, and Baby Bullet express service in both directions. Travel times between Redwood City and San Francisco are approximately 50 minutes, and travel times between Redwood City and San Jose are approximately 40 minutes for local and limited stop services. Caltrain's Baby Bullet express service makes it possible to travel between Redwood City and San Francisco or San Jose in less than 35 or 30 minutes, respectively. Caltrain offers about 20 weekday commute-hour Baby Bullet trains, which serve Redwood City southbound in the morning and northbound in the evening. On weekends, Caltrain operates approximately 35 trains per day with local stops only. The Redwood City Caltrain Station is currently the fifth highest ranked station in the corridor in terms of average weekday ridership with approximately 3,900 passengers (6.2 percent of the average weekday ridership system total) boarding and alighting daily at the station.⁸

The Caltrain Electrification Program, scheduled for completion in 2020/2021, is a plan to electrify the railway for increased efficiency and capacity.⁹ The program will increase frequency of service, including expansion of the number of peak hour trains.

⁸ Caltrain, 2017. *Annual Passenger Count Key Findings Report*. Website: www.caltrain.com/about/statsandreports/Ridership.html (accessed November 2, 2017).

⁹ 2020/2021 completion is according to the latest estimate on the project web site: www.caltrain.com/projectsplans/CaltrainModernization/Modernization.html.



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FIGURE IV.D-3

1548 Maple Street Project EIR
Existing Transit Facilities

SOURCE: FEHR & PEERS, NOVEMBER 2017

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(3) Shuttle Service. Shuttle service on the northeast side of US 101 in Redwood City is provided by Caltrain and the Peninsula Traffic Congestion Relief Alliance. While these shuttles currently travel along adjacent or nearby roadways, they do not stop near the project site. In the future, these routes could be modified to serve the project site, pending agreement of the operating agencies. Each shuttle service is described below.

- **Pacific Shores Shuttles** are operated by Caltrain and provide service between the Redwood City Caltrain Station and employment centers east of US 101 on Seaport Boulevard and Chesapeake Drive. These shuttles are free and are also open to the public. Headways are based on train arrivals and departures at the Redwood City Caltrain Station and the shuttles operate 7:00 a.m. to 12:00 p.m. and 3:00 p.m. to 9:00 p.m. on weekdays only. The shuttle travels through the intersection of Blomquist Street/Maple Street and could add a stop within walking distance of the project site (approximately a quarter mile).
- **Redwood City-Seaport Centre Caltrain Shuttle** is operated by the Peninsula Traffic Congestion Relief Alliance. It is designed to provide employees at the Seaport Centre Business Park with shuttle service directly from the Redwood City Caltrain Station. These shuttles are free and are also open to the public. Headways are based on train arrivals and departures at the Redwood City Caltrain Station and the shuttles operates approximately between the hours of 6:30 a.m. to 10:00 a.m. and 4:00 p.m. to 7:30 p.m. on weekdays only. The shuttle currently stops within walking distance of the project site, approximately a quarter mile away at the intersection of Blomquist Street/Maple Street.

c. Pedestrian Facilities. Pedestrian facilities vary throughout the study area; some streets have sidewalks, crosswalks, and pedestrian signals, whereas other streets lack any pedestrian facilities. Dedicated pedestrian facilities are provided along the Bay Trail (described below). US 101 is a substantial barrier to pedestrian connectivity between the project site and Downtown, with limited crossing opportunities. Existing crossing points for pedestrians include the Maple Street overcrossing and an informal trail underneath US 101 near Main Street.

(1) Existing Pedestrian Network. Figure IV.D-4 shows existing and proposed pedestrian facilities within the study area. As pedestrian facilities are currently lacking in the study area, the project has an opportunity to upgrade the pedestrian environment immediately adjacent to the project site, which will be important to create a neighborhood identity and sense of place for residents.

- **Seaport Boulevard** has a shared-use pedestrian and bicycle path on the east side of the road that serves as part of the Bay Trail north of Blomquist Street. At the signalized intersection with Blomquist Street, there is one marked crosswalk for pedestrians to travel between the northeast and northwest corners.
- **Maple Street** provides the only formal pedestrian access point to the project site across US 101. Maple Street has paved shoulders on the approaches to the overcrossing, a four-foot-wide sidewalk on the east side of the overcrossing, and a two-foot-wide shoulder on the west side of the overcrossing. Although people walk in the paved shoulder, the lack of a sidewalk connection and the narrow sidewalks where they exist makes walking trips across US 101 challenging. The recently completed Maple Street Correctional Center includes new sidewalks along its frontage on the east side of Maple Street and south side of Blomquist Street. Vehicle speeds are relatively low, and traffic is light on this segment of Maple Street.

- **Blomquist Street** has sidewalks on its southern side from Maple Street until approximately 100 feet west of the intersection with Seaport Boulevard.

In addition to the above pedestrian facilities, part of the existing Bay Trail includes the pedestrian/bicycle bridge crossing Redwood Creek, although the land side connections were never completed. Although this bridge provides access to the project site from the north, neither approach of the bridge meets current design standards for Americans with Disabilities Act (ADA) guidelines.

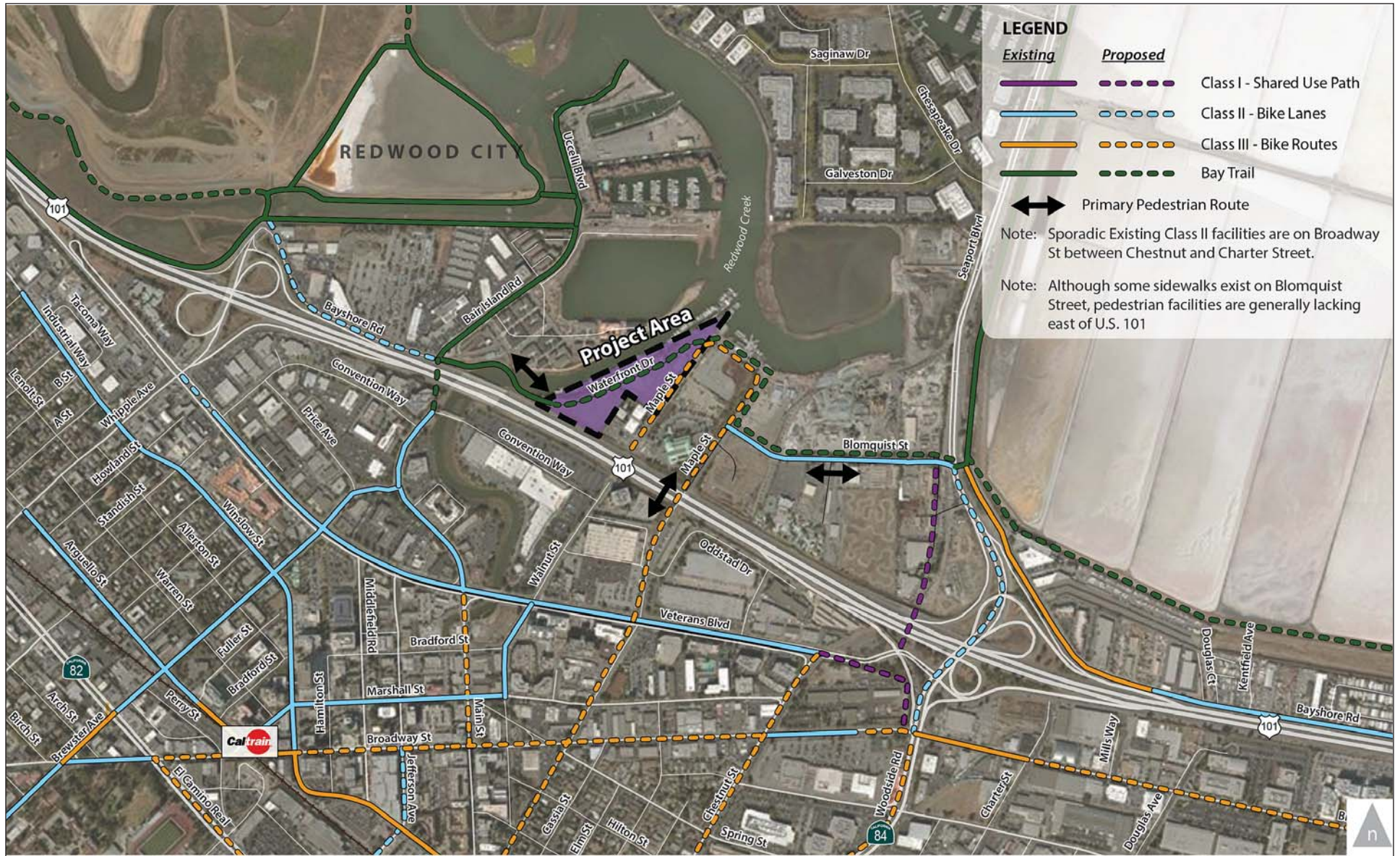
(2) Pedestrian Access to Transit. There are several local bus stops within a half-mile of the study area with the closest located at Maple Street/Blomquist Street, and the Redwood City Caltrain Station is approximately a one-mile walk away. Currently, people must walk across the Maple Street/US 101 overcrossing to connect to the Caltrain Station. As noted above, limited pedestrian facilities (i.e., sidewalks, marked crosswalks) and discontinuous coverage makes it difficult for pedestrians to access transit by foot.

(3) Pedestrian Counts. Existing pedestrian volumes are generally low near the project site, but are higher on the southwest side of US 101, closer to Downtown. The intersection of Maple Street/Veterans Boulevard has the highest pedestrian volumes within the study area with roughly 80 to 100 pedestrian crossings in the AM and PM peak hours. Other study intersections have 40 or fewer peak-hour pedestrians. The pedestrian counts are included in Appendix C to this EIR.

d. Bicycle Facilities. Redwood City has adopted three classes of bicycle facilities, which are the same as the standard classifications used by the Caltrans and commonly adopted by other jurisdictions. Caltrans guidelines and design standards are presented in the *Highway Design Manual* (Chapter 1000: Bikeway Planning and Design) and other design documents. Bicycle facilities are comprised of paths (Class I), lanes (Class II), and routes (Class III), as described below.

- **Class I Shared Use Path** provides a completely separate right-of-way and is designated for the exclusive use of bicycles and pedestrians, with vehicle cross-flow minimized.
- **Class II Bike Lane** provides a restricted right-of-way and is designated for the use of bicycles with a striped lane on a street or highway. Bicycle lanes are generally five feet wide. Adjacent vehicle parking and vehicle/pedestrian cross-flow are permitted.
- **Class III Bike Route** provides for a right-of-way designated by signs or pavement markings (sharrows) for shared use with pedestrians or motor vehicles. Sharrows are a type of pavement marking (bike and arrow stencil) placed to guide bicyclists to the best place to ride on the road, avoid car doors, and remind drivers to share the road with cyclists.
- **Class IV Separated Bikeway** provides on-street bicycle lanes with a three-foot minimum horizontal and vertical buffer from travel lanes or parking lanes. The physical separation provides a more comfortable riding experience for bicyclists; however, they still must mix with vehicles at intersections.

Figure IV.D-4 provides a map of existing and proposed bicycle facilities in the immediate vicinity of the project site. Similar to pedestrian facilities, bicycle connectivity between the site and Downtown Redwood City is limited and requires crossing over US 101. Existing crossing points for bicyclists include the Maple Street overcrossing and an informal trail near Main Street.



LSA

FIGURE IV.D-4

NOT TO SCALE

SOURCE: FEHR & PEERS, 2018.

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(1) Existing Bicycle Network. The existing bicycle network within the vicinity of the project site is described below.

- **Blomquist Street** provides existing east-west Class II bike lanes on both sides from Maple Street to Seaport Boulevard. These bike lanes serve as a key link between the Bay Trail segments to the northwest and the project site. Due to heavy truck traffic along Blomquist Street the bicycle lane markings are degraded or difficult to see. Although bicycling is legal on all City streets, no other designated bicycle facilities exist northeast of US 101. No public bicycle parking is provided.
- **Maple Street** is designated as a Bicycle Boulevard between Veterans Boulevard and Blomquist Street in the Redwood City General Plan. Although there are no marked facilities on Maple Street, the segment east of US 101 has relatively wide shoulders and low vehicle speeds.

Although there are limited opportunities for bicycles to cross US 101, there are several streets with bicycle facilities that connect to downtown Redwood City west of US 101 such as Veterans Boulevard, Brewster Avenue, and Marshall Street.

There are two existing segments of the Bay Trail just outside of the study area, including the Class I shared-use paths to the northwest of Redwood Creek across the bridge facility as noted earlier and to the east of the intersection of Blomquist Street/Seaport Boulevard/East Bayshore Road. These Class I paths provide bicycle connections to destinations to the north and south parallel to US 101 and to east along Seaport Boulevard.

(2) Bicycle Access to Transit. Lockable, sheltered bike parking is provided at the Redwood City Caltrain Station adjacent to the station platform. Approximately 330 daily passengers board with bikes at the Redwood City Caltrain station, making it the fourth busiest Caltrain station for bike ridership. Bicycle access to the Caltrain Station is provided via Maple Street and Broadway, which both currently lack bicycle amenities.

(3) Bicycle Counts. Blomquist and Maple Streets have the highest level of bicycle activity within the study area. Blomquist Street connects two existing segments of the Bay Trail and has Class II bike lanes. Maple Street is designated as a Bicycle Boulevard in the Redwood City General Plan and is a proposed Class III bicycle route. During the AM peak hour, 55 to 60 bicycles were counted using Blomquist Street at Maple Street and Seaport Boulevard, many of which were likely traveling along the Bay Trail. Approximately 35 bicycles were counted at Maple Street/Veterans Boulevard. During the PM peak hour, volumes are lower at each of these locations.

3. Regulatory Setting

The existing regulatory setting as it relates to transportation and circulation within the vicinity of the project site is described below.

a. Agencies with Jurisdiction over Transportation in Redwood City. The City of Redwood City has jurisdiction over all local City streets and City-operated traffic signals within the study area. Several regional agencies, including the City/County Association of Governments of San Mateo County (C/CAG), the Congestion Management Agency in San Mateo County, and the Metropolitan Transportation Commission (MTC), coordinate and establish funding priorities for intra-regional

transportation improvement programs. Freeways serving Redwood City (US 101 and I-280), associated local freeway ramps, intersections that serve as freeway ramp terminals, and local surface highway segments are under the jurisdiction of the State of California Department of Transportation (Caltrans). Transit service providers such as Caltrain, SamTrans, and the Water Emergency Transportation Authority (ferry service), have jurisdiction over their respective services. These agencies, their responsibilities, and funding sources are more specifically described below.

(1) City of Redwood City. The City of Redwood City is responsible for planning, constructing, and maintaining local public transportation facilities, including all City streets, City-operated traffic signals, sidewalks, and bicycle facilities. These local services are funded primarily by gas-tax revenue and developer fees.

(2) San Mateo City/County Association of Governments (C/CAG). C/CAG is the Congestion Management Agency (CMA) for San Mateo County authorized to set State and federal funding priorities for improvements affecting the San Mateo County Congestion Management Program (CMP) roadway system. C/CAG-designated CMP roadway system components in Redwood City include SR 82 (El Camino Real), SR 84 (Woodside Road), US 101, and I-280. C/CAG-designated CMP intersections in or near Redwood City include El Camino Real/Whipple Avenue, Bayfront Expressway/Marsh Road (borders Redwood City), and Woodside Road/Middlefield Road. C/CAG has set the level of service standards for US 101 segments in the vicinity of the project site.

C/CAG has adopted guidelines to reduce the number of net new vehicle trips generated by new developments. These guidelines apply to all developments that generate 100 or more net new peak-hour vehicular trips on the CMP network and are subject to CEQA review. The goal of the guidelines is that “the developer and/or tenants will reduce the demand for all new peak hour trips (including the first 100 trips) projected to be generated by the development.”

(3) Metropolitan Transportation Commission (MTC). The regional transportation planning agency and Metropolitan Planning Organization (MPO) for the nine-county Bay Area is the Metropolitan Transportation Commission (MTC). MTC is the authorized clearinghouse for State and federal transportation improvement funds. Each county’s CMA, including C/CAG, forwards a capital improvement project list to MTC. MTC reviews the lists submitted by all nine Bay Area counties and submits a regional priority list to the California Transportation Commission (CTC) and/or the Federal Highway Administration (FHWA) for selection of projects to receive funding. Funded projects are then included in the Regional Transportation Plan (RTP) prepared by MTC.

(4) California Department of Transportation (Caltrans). Caltrans has authority over the State highway system, including mainline facilities, interchanges, and arterial State routes. Caltrans approves the planning and design of improvements for all State-controlled facilities. Caltrans facilities in Redwood City include US 101 and its interchanges at Whipple Avenue and Woodside Road (SR 84); SR 82 (El Camino Real); and SR 84 (Woodside Road), including the El Camino Real/Woodside Road interchange.

(5) SamTrans. The San Mateo County Transit District (SamTrans) is the primary public transportation provider in San Mateo County. SamTrans manages local and regional bus service, paratransit services, and Caltrain commuter rail. There are over 50 routes in the county that can be categorized as community, express, BART connection, Caltrain connection, and BART and Caltrain connection routes.

(6) **Caltrain.** Caltrain operates 50 miles of commuter rail between San Francisco and San Jose, and limited service trains to Morgan Hill and Gilroy during weekday commute periods. Caltrain is funded through the Peninsula Corridor Joint Powers Board and managed by SamTrans. On weekdays, Caltrain operates approximately 100 trains per day of local, limited stop, and Baby Bullet express service in both directions.

(7) **Water Emergency Transit Agency.** The San Francisco Bay Area Water Emergency Transportation Authority (WETA) operates regional ferry service on the San Francisco Bay and coordinates water transit response to regional emergencies. WETA provides public ferry service to the cities of Alameda, Oakland, San Francisco, South San Francisco, and Vallejo. WETA's long-term vision includes service between Redwood City and Downtown San Francisco. The potential terminal would be located at the Port of Redwood City, approximately two miles northeast of the project site. WETA currently lacks funding to build and operate service to this potential terminal.

b. Pertinent Plans and Policies. Planning and policy documents that apply to transportation and circulation within the vicinity of the site are described below.

(1) **Redwood City General Plan.** The Redwood City General Plan was adopted in October 2010 to guide future decision making in Redwood City. The Circulation Element of the General Plan was developed to guide decision making specific to transportation. The goal of the Circulation Element is to:

Goal BE-25: Maintain a local transportation system that balances the needs of bicyclists, pedestrians, and public transit with those of private cars.

All projects should be evaluated to ensure they are consistent with the General Plan goals and policies related to transportation. At a minimum, transportation analysis should evaluate the project access points, connectivity to adjacent bicycle, pedestrian, transit and vehicle facilities. Specific significance criteria from the General Plan are presented in Section IV.D.4 below.

(2) **Redwood City Transportation Plan (Public Draft).** A comprehensive assessment of transportation within Redwood City (RWCmoves) is currently in the public draft stage, but has not yet been adopted by the City. The RWCmoves document provides a vision for the city's transportation network and tiers off goals established in the city's General Plan. Specific citywide transportation plan goals are identified related to creating a safe and efficient multimodal network that is accessible to all users. RWCmoves also identifies potential transportation projects and programs to help attain the transportation goals outlined including active transportation corridors, complete street corridors, transit improvements, roadway congestion improvements, network gap closures, transportation technologies, and transportation demand management. RWCmoves proposes a Bicycle Backbone Network to provide Citywide connectivity by bicycle for people of all ages and abilities. Relevant to this project is the proposed Class I bicycle path on Blomquist Street from Maple Street to Redwood Creek.

(3) **Redwood City Transportation Impact Mitigation Fee Program.** The Redwood City Transportation Impact Mitigation Fee Study (TIF) has been prepared and adopted by the City to establish a source of funding for future transportation system capital improvements in the City. The transportation fee program has been formulated to fully fund a variety of transportation improvement projects located throughout the City. The list of transportation projects associated with the

transportation fee program is on file with the Redwood City Community Development Department, City Hall, 1017 Middlefield Road, and is subject to amendment periodically. Notable TIF projects within the study area include the Blomquist Street Extension to East Bayshore Road and the addition of an eastbound right-turn lane at Veterans Boulevard/Whipple Avenue. In addition, the TIF includes area-wide improvements and projects to include alternative and transit modes such as neighborhood traffic management programs, a transportation demand management coordinator, and miscellaneous transit, pedestrian, and bicycle projects throughout the City.

(4) C/CAG Guidelines. C/CAG has adopted guidelines as a part of its CMP, which are intended to reduce the regional traffic impacts of substantive new developments. The guidelines apply to all projects in San Mateo County that will generate 100 or more net new peak-hour trips on the CMP network and are subject to CEQA review. C/CAG calls for projects that meet the criteria to determine if a combination of acceptable measures is possible that has the capacity to “fully reduce,” through the use of a trip credit system, the demand for net new trips that the project is anticipated to generate on the CMP roadway network (including the first 100 trips). C/CAG has published a list of mitigation options in a memorandum that also outlines a process for obtaining C/CAG approval. The project is expected to generate fewer than 100 peak hour trips, and therefore does not need to obtain C/CAG approval.

(5) US 101/SR 84 (Woodside Road) Interchange Improvement Project. The City of Redwood City, in cooperation with Caltrans, recently completed an environmental study to modify the existing US 101/SR 84 (Woodside Road) interchange to increase roadway capacity and improve pedestrian and bicycle access through the interchange area. Some of the key project components include:

- Redesign of the existing southbound off-ramp termini from a five-legged intersection to a four-legged intersection to reduce vehicle, pedestrian, and bicycle conflicts;
- A direct Veterans Boulevard ramp connection to US 101 to reduce vehicular traffic on Woodside Road;
- Perpendicular ramp termini to Woodside Road to allow for improved crossings for both pedestrians and bicyclists; and
- Class I multi-use paths on the south side of the interchange and along the UPRR corridor to provide safer pedestrian/bicycle access through the interchange.

The project does not add capacity to US 101; but rather focus primarily on reconfiguring the ramp terminal intersections at Woodside Road to improve local street traffic operations. The project includes a direct ramp connector from northbound US 101 to northbound Veterans Boulevard and southbound Veterans Boulevard to southbound US 101. Preliminary design, technical studies, and environmental review were completed in 2016. Final design and preparation of construction documents are expected to be completed by 2020. Construction of the proposed interchange improvements is expected to be complete by 2023, pending Caltrans approval and identification of funding sources.

(6) San Francisco Bay Trail Plan. The San Francisco Bay Trail Plan¹⁰ and Enhanced San Francisco Bay Area Water Trail Plan¹¹ provide guidance to the development of a shared-use bicycle and pedestrian path that will in the future allow continuous travel around the San Francisco Bay. The

¹⁰ Association of Bay Area Governments, 1989. San Francisco Bay Trail Plan.

¹¹ California Coastal Conservancy, 2011. Enhanced San Francisco Bay Area Water Trail Plan.

project study area represents a gap in the trail separating the existing segments northwest of Redwood Creek and southeast of Seaport Boulevard.

4. Significance Criteria

The criteria for evaluating the significance of a project's environmental impacts are based on the California Environmental Quality Act (CEQA) Guidelines Appendix G and applicable standards recognized by Redwood City and C/CAG. For this analysis, transportation impacts are considered significant if the project would:

- Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit;
- Conflict with an applicable congestion management program, including, but not limited to, level of service (LOS) standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways;
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
- Result in inadequate emergency access; or
- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

The following criteria are derived from Appendix G of the State CEQA Guidelines and from prior traffic studies conducted with the City of Redwood City that established LOS D as the minimum acceptable threshold for signalized and unsignalized intersections. This policy applies Citywide, except the Downtown area, as defined by the Downtown Precise Plan, and some intersections in the congestion management program network. However, these intersections were not selected for study, therefore the LOS threshold for all project study intersections is LOS D. C/CAG has developed LOS thresholds for freeway segments as part of their Congestion Management Program (CMP).

To evaluate project-level and cumulative impacts at study intersections and freeway segments and ramps, the following specific thresholds derived from C/CAG Guidelines, the Redwood City General Plan, and City best practices were used. The addition of project-generated traffic would create a significant traffic impact if, the project would:

- Cause an intersection operating acceptably without the project to exceed the applicable LOS threshold;
- Increase the average delay at a signalized intersection operating at an unacceptable level by five or more seconds;
- Increase the delay at an unsignalized intersection operating at an unacceptable level by five or more seconds; and the traffic volumes at the intersection satisfy the Caltrans Peak Hour Volume Signal Warrant for traffic signal installation;

- Cause a freeway segment currently meeting its CMP LOS standard not to meet that standard;
- Increase the amount of traffic on a freeway segment already exceeding its CMP LOS standard and/or its capacity by more than one percent of the freeway segment's capacity;
- Cause the volume-to-capacity (V/C) ratio for a freeway ramp to exceed 1.00; or
- Increase traffic by more than five percent of the freeway ramp's capacity on a freeway ramp with a V/C ratio already exceeding 1.00.

In addition to traffic operations, the project would create a significant impact if the following would occur:

- Substantially increase traffic hazards due to a design feature (e.g., sharp curves or dangerous intersections)
- Conflict with any existing or approved pedestrian, transit, and/or bicycle facilities or services;
- Cause pedestrian, transit, and/or bicycle facilities to be frequently blocked by cars or other potential safety obstructions/hazards;
- Cause vehicles to cross pedestrian or bicycle facilities on a regular basis at driveway entrances lacking adequate sight distance or warning systems;
- Encourage pedestrians to cross roads in undesignated areas;
- Result in inadequate emergency access by substantially increasing emergency vehicle travel times;
- Result in unsafe or hazardous conditions during construction; or
- Result in inadequate parking supply.

5. Proposed Project and Project Variant Impacts

This section includes an analysis of the proposed project's and the project variant's impacts on the existing transportation and circulation system. CEQA Guidelines Appendix G, the Redwood City General Plan, C/CAG Guidelines, and Redwood City staff were consulted to determine the criteria for which project-level impacts should be evaluated against as part of this analysis. Project-level impacts are presented in the following order in this section: traffic hazards; traffic operations; air traffic patterns; public transit; pedestrian and bicycle circulation; emergency vehicle access and circulation; construction impacts; and parking.

a. Traffic Hazards. Primary access to the project site would be provided by improving Maple Street north of Blomquist Street and the internal section of Maple Street.

A new internal roadway would be constructed, which would span the north end of the side parallel to Redwood Creek and would terminate at the northwest corner of the project site. There would be two ingress and egress drive aisles leading from the new internal roadway to Maple Street. The internal roadway would be a minimum of 26 feet in width, with alleys a minimum of 20 feet. These roadway widths would provide adequate vehicle circulation within the project study area.

Based on the project description and site plan, the project is not expected to create any additional traffic hazards to the roadway network. The project is not expected to create or worsen any existing conflict between pedestrians, bicycles, transit, vehicles, or trucks. Additionally, all new roadways would be designed in compliance with all Redwood City design guidelines to ensure safe and efficient access. The project's effect on traffic hazards would be less-than-significant under Existing Plus Project conditions.

Traffic hazards for the project variant are expected to be very similar to that for the project. In addition to the project's extension of Blomquist Street to Maple Street, the project variant would continue the Blomquist Extension further to Redwood Creek to provide additional internal circulation to the project site. Similar to the project, all new roadways would be designed in compliance with all Redwood City design guidelines to ensure safe and efficient access for all users. Similarly to the project, the project variant's effect on traffic hazards would be less-than-significant under Existing Plus Project conditions.

b. Traffic Operations. This section evaluates the transportation-related impacts of the proposed project under Existing Plus Project Conditions, presenting estimated vehicle trip generation associated with development of the project, and the distribution of those vehicle trips on the study area's roadway network. The impacts of the increased traffic at intersections and on freeway segments and ramps in the context of applicable significance criteria are then described.

(1) Vehicle Trip Generation Estimates. Vehicle trip estimates were developed using trip generation methodology provided by the Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition. The Trip Generation Manual provides estimated rates for AM and PM peak hour trips, which traffic volumes are the highest on adjacent streets. Table IV.D-7 shows trip generation estimates for the proposed project. The analysis presented in this report is based on 131 dwelling units, which is expected to generate 64 external vehicle trips in the AM peak hour and 75 external vehicle trips during the PM peak hour.

In 2000, C/CAG adopted a policy that requires all projects that generate 100 or more peak hour trips on the Congestion Management Program (CMP) roadway network to include a transportation Demand Management (TDM) plan that reduces the demand for new peak hour trips. Since the project is not expected to generate more than 100 peak hour trips during either the AM or PM peak hour, the project is not subject to C/CAG's TDM requirements.

The surface parking lot occupying the western half of the project site is currently used by a local car dealership as an overflow parking lot. The parking lot currently operates on a month-to-month lease, and would be removed with development of the proposed project. The surface parking lot is expected to generate a negligible amount of AM and PM peak hour vehicle trips, and therefore was not included in the trip generation analysis. The analysis conservatively assumes uses within the adjacent Docketown Marina would continue. In addition, trip credits were not applied for existing uses at the Peninsula Yacht Club, which would be demolished with the proposed project. By not applying credits for the potential removal of vehicles generated by the existing land uses on the project site, the trip generation presented in Table IV.D-7 represents a conservative approach for estimating the project's total external vehicle trips.

Table IV.D-7: Project Trip Generation

| ITE Land Use | Units | Daily Trips | AM Peak Hour ^a | | | PM Peak Hour ^a | | |
|---|-------|-------------|---------------------------|-----|-------|---------------------------|-----|-------|
| | | | In | Out | Total | In | Out | Total |
| Residential Condominium/Townhouse (ITE Land Use Code 230) | 131 | 814 | 11 | 53 | 64 | 50 | 25 | 75 |

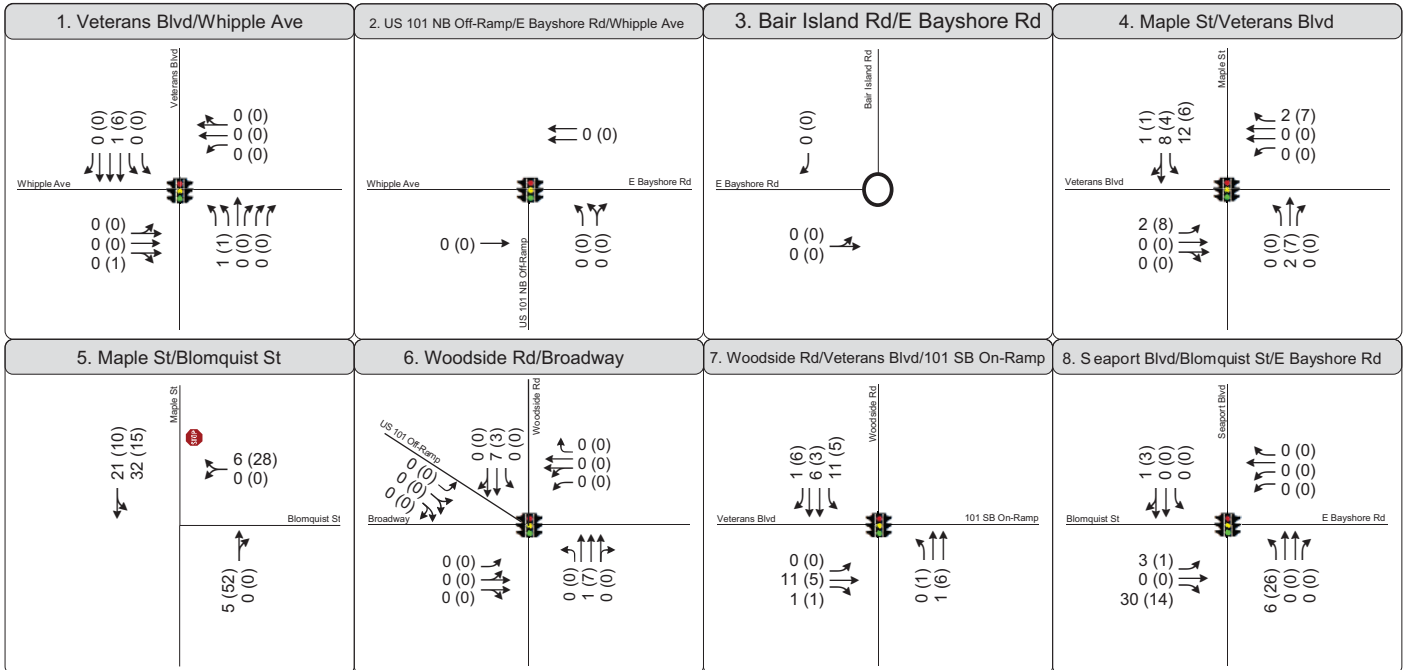
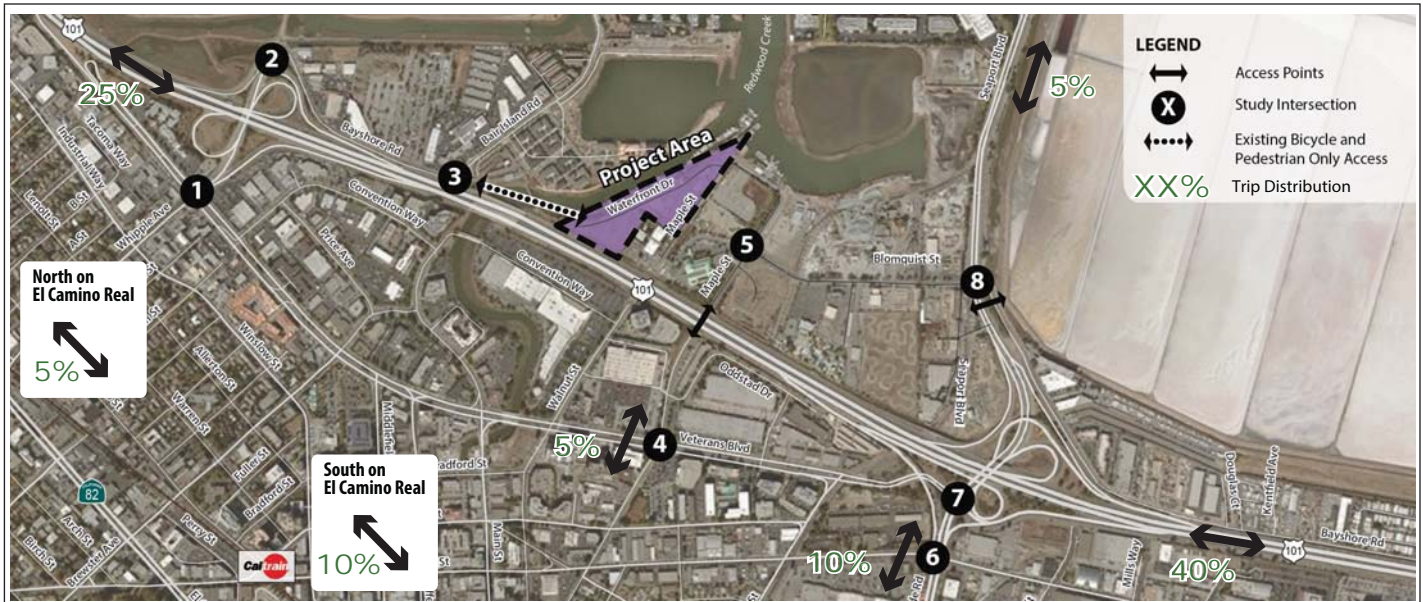
^a Trip Generation fitted curve equation provided by the Trip Generation Manual (9th Edition):
 AM Peak Hour: $\ln(T) = 0.80 * \ln(x) + 0.26$; Enter = 17%; Exit = 83%
 PM Peak Hour: $\ln(T) = 0.82 * \ln(x) + 0.32$; Enter = 67%; Exit = 33%
 Source: *ITE Trip Generation (9th Edition)*; Fehr & Peers, 2017.

(2) Vehicle Trip Distribution. Vehicle trips were assigned to the surrounding roadway networks and to study intersections based on trip distribution patterns shown in Figure IV.D-5. Although the proposed project includes a Partial Blomquist Street Extension to Maple Street and the project variant includes a Partial Blomquist Street Extension to Redwood Creek, the vehicle trip distribution conservatively analyzes access as if no such extension were in place; all project trips were distributed to use the northern segment of Maple Street to access the project site. This represents a conservative analysis because it limits the number of turning movements vehicles can make to enter/exit the project site. With the partial extension in place, vehicles would have more options on how to access the site and project traffic would be more dispersed rather than concentrated to a limited number of movements.

(3) Existing Plus Project Conditions. The Existing Plus Project condition does not include proposed improvements to the roadway network, with the exception of the re-constructed Maple Street within the project site. The project applicant would be required to contribute their fair share to the improvements identified as part of this project.

Intersection Operations. Existing intersection volumes plus new vehicle trips due to the proposed project are shown on Figure IV.D-6. Existing Plus Project intersection operations are shown in Table IV.D-8. Development of the project would contribute traffic and worsen traffic operations from acceptable levels to unacceptable levels, or increase delay by more than five seconds at study intersections that currently operate at unacceptable levels of service, at the following location:

6. Broadway/Woodside Road/US 101 Southbound Off-Ramp – AM peak hour

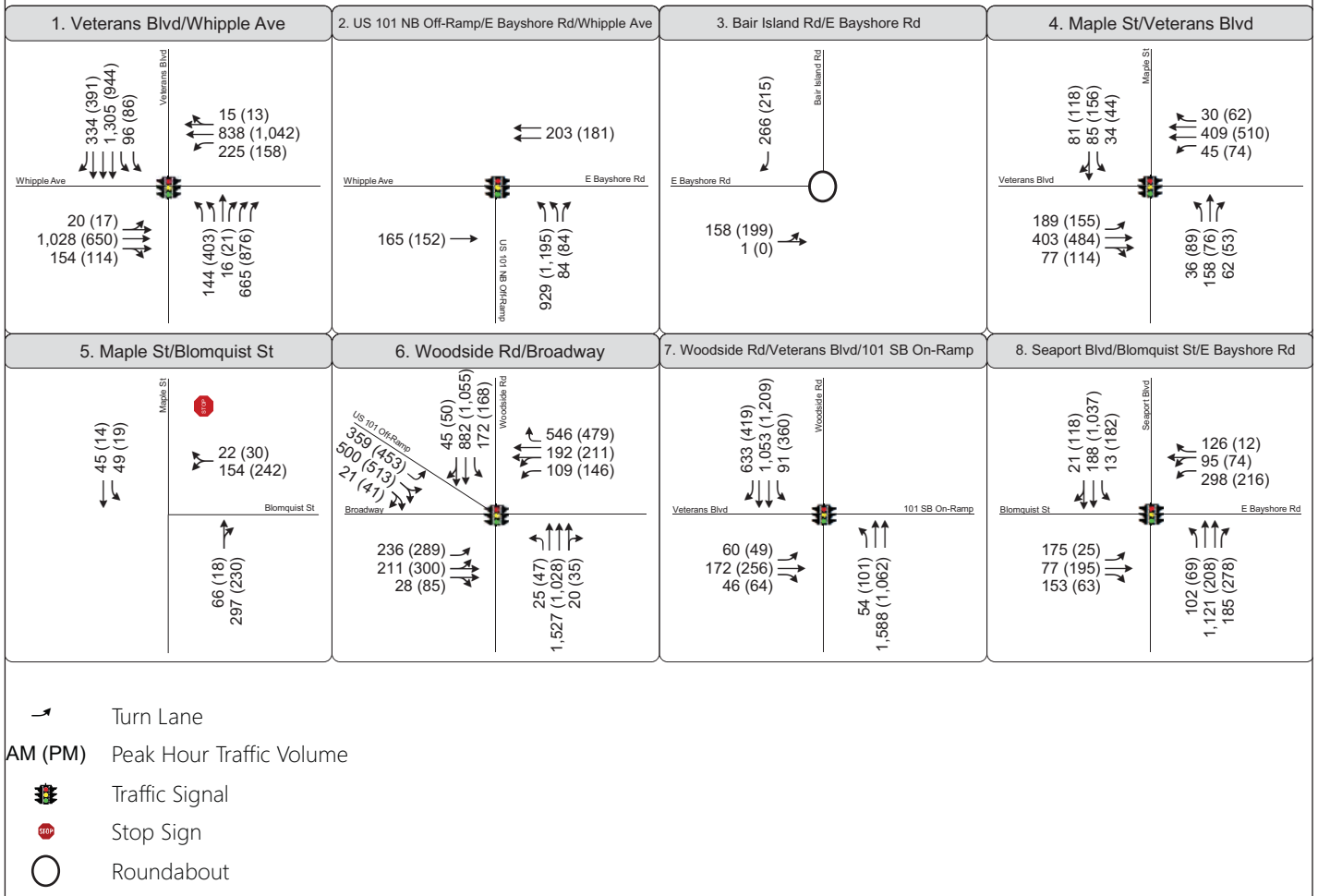
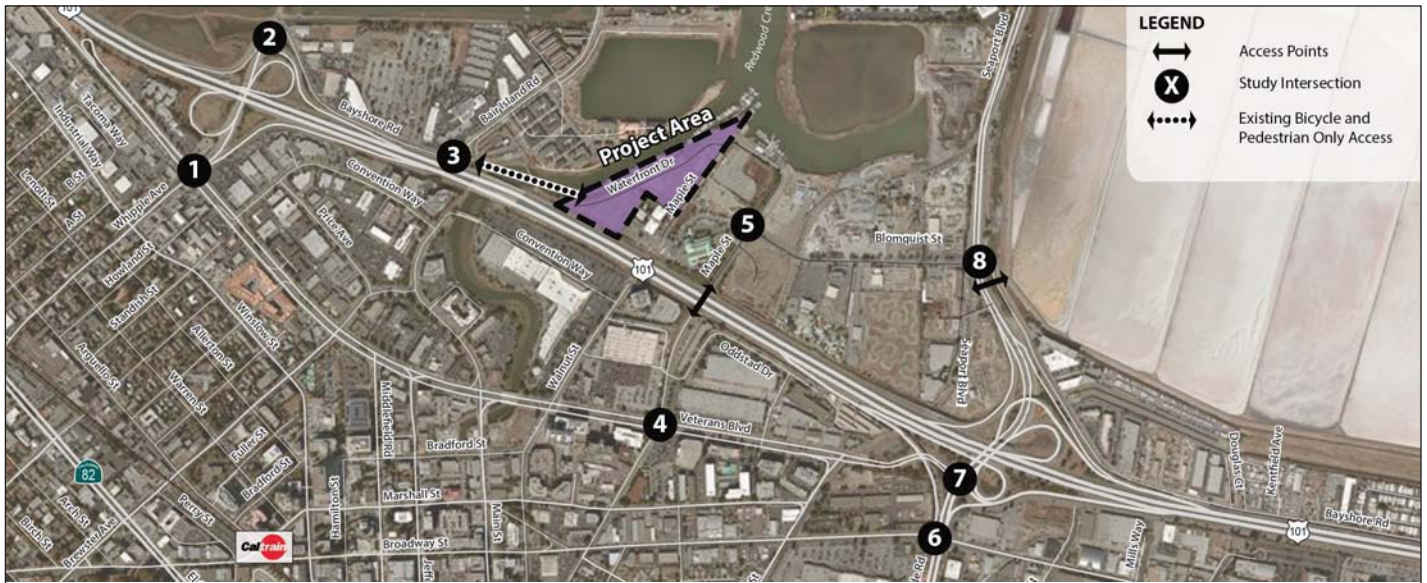


- Turn Lane
- AM (PM)** Peak Hour Traffic Volume
- Traffic Signal
- Stop Sign
- Roundabout

LSA

FIGURE IV.D-5





LSA

FIGURE IV.D-6



1548 Maple Street Project EIR

Existing Plus Project

Peak Hour Traffic Volumes and Lane Configurations

SOURCE: FEHR & PEERS, 2018.

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Table IV.D-8: Existing Intersection Level of Service (LOS) Results

| Intersection | Traffic Control | Existing Conditions | | | | Existing Plus Project and Project Variant Conditions | | | | Change in Delay ^b | |
|---|-----------------|---------------------|----------|--------------------|----------|--|----------|--------------------|----------|------------------------------|--------------------|
| | | AM Peak | | PM Peak | | AM Peak | | PM Peak | | AM Peak | PM Peak |
| | | Delay ^a | LOS | Delay ^a | LOS | Delay ^a | LOS | Delay ^a | LOS | Delay ^a | Delay ^a |
| 1. Veterans Boulevard/Whipple Avenue | Signal | 39 | D | 66 | E | 39 | D | 66 | E | - | +0.2 |
| 2. Whipple Avenue/US 101 Northbound Off-Ramp | Signal | 14 | B | 17 | B | 14 | B | 17 | B | - | - |
| 3. East Bayshore Road/Bair Island Road | Roundabout | < 10 | A | < 10 | A | < 10 | A | < 10 | A | - | - |
| 4. Maple Street/Veterans Boulevard | Signal | 18 | B | 23 | C | 18 | B | 23 | C | - | - |
| 5. Blomquist Street/Maple Street | SSSC | < 10 | A | < 10 | A | < 10 | A | < 10 | A | - | - |
| 6. Broadway/Woodside Road (SR 84)/US 101 Southbound Off-Ramp | Signal | > 80 | F | > 80 | F | > 80 | F | > 80 | F | +27.2 | -9.3 |
| 7. Veterans Boulevard/Woodside Road (SR 84)/US 101 Southbound On-Ramp | Signal | 18 | B | > 80 | F | 22 | C | > 80 | F | - | +2.7 |
| 8. Blomquist Street/Seaport Boulevard/East Bayshore Road | Signal | 28 | C | 25 | C | 34 | C | 33 | C | - | - |

^a For signalized intersections and roundabouts, delay is the weighted average for all movements in seconds per vehicle. For side-street stop controlled (SSSC) intersections, delay is the worst-operating approach delay.

^b Change in delay is calculated as average delay under Existing Plus Project – Existing Conditions. Change in delay is only shown for intersections operating at unacceptable LOS under Existing Conditions. Significance threshold for intersections operating unacceptably is if the Project adds more than five seconds of delay.

Bold = unacceptable LOS. **Shaded** = significant impact.

Source: Fehr & Peers, 2017.

Impact TRA-1: Development of the proposed project and the project variant would add traffic to Broadway/Woodside Road (SR 84)/US 101 Southbound Off-Ramp (Intersection #6), which currently operates at LOS F in the AM peak hour under Existing conditions, and would increase vehicle delay at this intersection by more than the five-seconds. (S)

A signal timing adjustment to redistribute green time to better serve future vehicle demand would reduce delay at the Broadway/Woodside Road (SR 84)/US 101 Southbound Off-Ramp intersection and improve operations. This would cause the intersection to operate at similar LOS but with lower average seconds of delay per vehicle when compared to existing conditions. The City, as Lead Agency, and the project applicant would need to coordinate with Caltrans to implement this improvement; however, Caltrans is generally agreeable towards minor signal timing changes when the improvement does not negatively affect ramp operations or queues. Implementation of Mitigation Measure TRA-1, below would ensure that impacts to the level of service at the Broadway/Woodside Road (SR 84)/US 101 Southbound Off-Ramp would be reduced to a less-than-significant level.

Mitigation Measure TRA-1: The project applicant shall pay to retime and optimize the traffic signals at Broadway/Woodside Road (SR 84)/US 101 Southbound Off-Ramp. Since Caltrans controls this intersection, the project applicant would need to coordinate with the City and Caltrans to implement the mitigation measure. (LTS)

The remaining intersections that operate at acceptable LOS under Existing conditions would continue to operate at an acceptable LOS with the proposed project. The intersections that operate at an unacceptable LOS under Existing conditions would continue to operate at an unacceptable LOS, however average vehicle delay would not increase by more than five seconds with additional traffic from the project. Therefore, impacts to these study intersections would be less than significant under Existing Plus Project conditions.

Freeway Operations. The US 101 study freeway segments and ramps were analyzed to determine if added traffic resulting from the project would have a significant impact on the freeway system. The results of the freeway segment and ramp capacity analyses are shown in Tables IV.D-9 and IV.D-10.

Table IV.D-9: Existing Plus Project Freeway Segment Level of Service (LOS) Results

| Segment | Peak Hour | Direction ^a | Existing | | | Existing Plus Project | | | | |
|--|-----------|------------------------|----------|------------------|-----|-----------------------|---------------|--------|------------------|-----|
| | | | Volume | V/C ^b | LOS | Added Trips | % of Capacity | Volume | V/C ^b | LOS |
| A. US 101, Marsh Road to Woodside Road (SR 84) | AM | NB | 8,198 | 0.89 | E | 13 | 0.1% | 8,211 | 0.89 | E |
| | | SB | 9,020 | 0.98 | E | 2 | 0.0% | 9,022 | 0.98 | E |
| | PM | NB | 7,750 | 0.84 | D | 9 | 0.1% | 7,759 | 0.84 | D |
| | | SB | 8,061 | 0.88 | D | 12 | 0.1% | 8,073 | 0.88 | D |
| B. US 101, Woodside Road (SR 84) to Whipple Avenue | AM | NB | 8,006 | 0.92 | E | 13 | 0.1% | 8,019 | 0.92 | E |
| | | SB | 8,080 | 0.93 | E | 1 | 0.0% | 8,081 | 0.93 | E |
| | PM | NB | 7,228 | 0.83 | D | 9 | 0.1% | 7,237 | 0.83 | D |
| | | SB | 7,518 | 0.86 | D | 6 | 0.1% | 7,524 | 0.86 | D |
| C. US 101, Whipple Avenue to Holly Street | AM | NB | 8,502 | 0.98 | E | 3 | 0.0% | 8,505 | 0.98 | E |
| | | SB | 7,797 | 0.90 | E | 21 | 0.2% | 7,818 | 0.90 | E |
| | PM | NB | 7,159 | 0.82 | D | 14 | 0.2% | 7,173 | 0.82 | D |
| | | SB | 7,778 | 0.89 | E | 10 | 0.1% | 7,788 | 0.90 | E |

^a NB = Northbound; SB = Southbound

^b V/C = Volume-to-Capacity Ratio

Bold = exceeds CMP LOS standard. **Shaded** = significant impact.

Source: Fehr & Peers, 2017.

As shown in Table IV.D-9, no freeway segment is expected to exceed a V/C ratio of 1.00 with the addition of vehicle traffic from the project. All freeway segments would continue to operate at or better than the CMP LOS standard (LOS F), and therefore impacts to freeway mainline segments would be less-than-significant under Existing Plus Project conditions.

As shown in Table IV.D-10, all freeway ramps are expected to operate at acceptable LOS D or better with the addition of vehicle traffic from the project. Therefore, impacts to freeway ramps would be less than significant under Existing Plus Project conditions.

Traffic operations for the project variant are expected to be the same as for the project. Trip generation, distribution, and assignment would be the same as with the project. Intersection and freeway volumes and analysis would also be the same. The project variant would have the same impacts related to traffic operations and would require the same mitigation measures under Existing Plus Project conditions.

Table IV.D-10: Existing Plus Project Ramp Level of Service (LOS) Results

| Freeway Interchange and Ramp ^a | | Peak Hour | Existing | | | Existing Plus Project | | | | |
|---|--|-----------|----------|------------------|-----|-----------------------|-----------|--------|------------------|-----|
| | | | Volume | V/C ^b | LOS | Added Trips | % of Cap. | Volume | V/C ^b | LOS |
| US 101/Woodside Road | | | | | | | | | | |
| NB | Off-Ramp to Woodside Road | AM | 1,719 | 0.86 | D | 3 | 0.2% | 1,722 | 0.86 | D |
| | | PM | 1,230 | 0.62 | C | 14 | 0.7% | 1,244 | 0.62 | C |
| | On-Ramp from WB Seaport Boulevard | AM | 264 | 0.15 | A | 13 | 0.7% | 277 | 0.15 | A |
| | | PM | 579 | 0.32 | B | 9 | 0.5% | 588 | 0.33 | B |
| | On-Ramp from EB Woodside Road | AM | 1,093 | 0.61 | C | 0 | 0.0% | 1,093 | 0.61 | C |
| | | PM | 864 | 0.48 | B | 0 | 0.0% | 864 | 0.48 | B |
| SB | Off-Ramp to EB Seaport Boulevard | AM | 526 | 0.29 | A | 1 | 0.1% | 527 | 0.29 | A |
| | | PM | 158 | 0.09 | A | 6 | 0.3% | 164 | 0.09 | A |
| | Off-Ramp to WB Woodside Road | AM | 884 | 0.44 | B | 0 | 0.0% | 884 | 0.44 | B |
| | | PM | 1,008 | 0.50 | C | 0 | 0.0% | 1,008 | 0.50 | C |
| | On-Ramp from Woodside Road | AM | 936 | 0.47 | B | 21 | 1.1% | 957 | 0.48 | B |
| | | PM | 1,240 | 0.62 | C | 10 | 0.5% | 1,250 | 0.63 | C |
| US 101/Whipple Avenue | | | | | | | | | | |
| NB | Off-Ramp to Whipple Avenue | AM | 1,014 | 0.51 | C | 0 | 0.0% | 1,014 | 0.51 | C |
| | | PM | 1,282 | 0.64 | C | 0 | 0.0% | 1,282 | 0.64 | C |
| | On-Ramp from EB Whipple Avenue | AM | 1029 | 0.57 | C | 0 | 0.0% | 1029 | 0.57 | C |
| | | PM | 924 | 0.51 | C | 0 | 0.0% | 924 | 0.51 | C |
| | On-Ramp from WB Whipple Avenue | AM | 75 | 0.08 | A | 0 | 0.0% | 75 | 0.08 | A |
| | | PM | 69 | 0.08 | A | 0 | 0.0% | 69 | 0.08 | A |
| SB | Off-Ramp to Veterans Ave./Whipple Ave. | AM | 1,727 | 0.45 | B | 1 | 0.0% | 1,728 | 0.45 | B |
| | | PM | 1,355 | 0.36 | B | 6 | 0.2% | 1,361 | 0.36 | B |
| | On-Ramp from WB Whipple Avenue | AM | 54 | 0.06 | A | 0 | 0.0% | 54 | 0.06 | A |
| | | PM | 165 | 0.18 | A | 0 | 0.0% | 165 | 0.18 | A |
| | On-Ramp from EB Whipple Avenue | AM | 595 | 0.30 | A | 0 | 0.0% | 595 | 0.30 | A |
| | | PM | 543 | 0.27 | A | 0 | 0.0% | 543 | 0.27 | A |

^a Theoretical capacities of ramps per Exhibit 25-3 of HCM 2000: 2,000 vehicles per hour (vph) for single-lane diagonal ramps, 1,800 vph for loop ramps, and 3,800 vph for dual-lane diagonal off-ramps.

^b V/C = Volume-to-Capacity Ratio

NB = Northbound; SB = Southbound; EB = Eastbound; WB = Westbound

Bold = exceeds CMP LOS standard. **Shaded** = significant impact.

Source: Fehr & Peers, 2017.

c. Air Traffic Patterns. The project site is about 2.5 miles from the San Carlos Airport, about 10 miles from San Jose International Airport, about 11 miles from San Francisco International Airport, and about 16 miles from Oakland International Airport. Additional trips associated with the project would not contribute substantially to demand for commercial flights. Therefore, the project would not substantially increase flight operations. In addition, no buildings or features would be constructed on-site that would interfere with flight operations at local airports. The project's effect on air traffic patterns would be less-than-significant under Existing Plus Project conditions.

Similar to the proposed project air traffic patterns for the project variant would not change. Therefore, similar to the project, the project variant's effect on air traffic patterns would be less-than-significant under Existing Plus Project conditions.

d. Public Transit. The proposed project would increase marginal demand for transit service in the area surrounding the project site. Existing public transit service in the area includes Caltrain and local and regional bus service provided by SamTrans. Caltrain provides the primary high-frequency and

capacity transit service in the area, with the nearest station in Downtown Redwood City approximately one mile from the project site. Bicycle access from the project to the Caltrain station is provided by the Community Proposed Class II or III bikeway on Maple Street, which will connect to a Community Proposed Class II bike lane on Broadway. Pedestrians will utilize the same route in order to access the station. The Caltrain Electrification Program, scheduled for completion in 2020/2021, is a plan to electrify the railway for increased efficiency and capacity. The program will increase frequency of service including expansion of the number of peak hour trains. SamTrans Route 270 and shuttles operated by Caltrain travel along Blomquist Street and Seaport Boulevard near the project site with a stop located at Maple Street and Blomquist Street. Pedestrian access to the site is provided along Maple Street as well as the partial Blomquist Street Extension to Maple Street connecting to the project.

The project would not create new potential conflicts between various transit modes and would not conflict with existing plans for transit service in the area. Therefore, the project's impact to transit service would be less-than-significant under Existing Plus Project conditions.

Effects on public transit for the project variant are expected to be the same as for the project. Similarly to the project, the project variant's impact to public transit would be less-than-significant under Existing Plus Project conditions.

e. Pedestrian and Bicycle. The project would result in a marginal increase in pedestrian and bicycle activity due to residents in and around the project site. Pedestrian access throughout the site would be provided via internal walkways and sidewalks. Sidewalk widths through the project would be a minimum of four feet in width, which would provide adequate pedestrian circulation.

Off-site bicycle access to the project site is provided via an existing Class II bike lane on Blomquist Street connecting the project site to Seaport Boulevard. Broadway is currently designated as a Community Proposed Class II or Class III facility in the 2010 Circulation Element of the City's General Plan. Although Chestnut Street does not currently accommodate bicyclists, it is designated as a Community Proposed Class II or Class III facility in the City's Circulation Element, along with several other east-west streets such as Woodside Road and Maple Street. A Community Proposed Class II or III bike lane on Maple Street will connect the project site to Downtown via Class II bike lanes on Veterans Boulevard.

The San Francisco Bay Trail currently designates Blomquist Street from Seaport Boulevard to Maple Street as planned Bay Trail off-street bicycle and pedestrian path. The Bay Trail is also proposed along Maple Street from Blomquist Street to connect to the bridge over Redwood Creek. The project description includes a multiuse path along the northeast edge of the project site which will serve as a segment of the Bay Trail through the project site.

The project would not create new potential conflicts between various modes and would not conflict with existing plans for pedestrian and bicycle facilities service in the area. Therefore, the project's impact to pedestrians and bicycle facilities would be less-than-significant under Existing Plus Project conditions.

Pedestrian and bicycle conditions for the project variant are expected to be very similar as for the project. Similarly to the project, the project variant's impact to pedestrian and bicycle facilities would be less than significant under Existing Plus Project conditions.

f. Emergency Vehicle Access and Circulation. Emergency vehicle access to the project site would primarily be provided by Maple Street. There is secondary emergency vehicle access from Seaport Boulevard onto Blomquist Street which leads to the project site. The project site is within one mile from the nearest fire station, located at 755 Marshall Street in Downtown Redwood City. Under current traffic conditions, it takes approximately three minutes to access the site from this fire station during the PM peak hour, which is less than the City’s standard for emergency response time (five minutes or less for 85 percent of all calls).

Development of the project would result in increased traffic congestion and delay at study intersections under Existing Plus Project conditions. This additional traffic congestion could slow emergency response and evacuation. However, as shown in Table IV.D-11, an evaluation of traffic conditions with the project in place indicates that traffic congestion along northbound Maple Street would not worsen emergency travel times beyond the City’s threshold. For the above reasons, development of the project would not result in inadequate emergency access; the impact would be less than significant under Existing Plus Project conditions.

Table IV.D-11: PM Peak Hour Estimated Emergency Response Times

| Study Intersection | Reported Vehicle Delay on Northbound Maple Street | |
|--|---|-----------------------|
| | Existing | Existing Plus Project |
| 4. Maple Street/Veterans Blvd | 0:18 | 0:18 |
| 5. Blomquist Street/Maple Street | 0:02 | 0:05 |
| <i>Increased Travel Time</i> | – | +0:03 |
| Estimated Travel Time^a | 3:00 | 3:03 |

^a Estimated travel time based on a review of Google maps during peak hours of congestion during the day. These estimates do not account for the fact that fire department vehicles could bypass vehicle queues and red lights. Actual travel times may vary.

Source: Fehr & Peers, 2017.

Emergency vehicle access and circulation for the project variant are expected to be very similar to that of the project. With the Blomquist Extension to Redwood Creek, one additional emergency vehicle access point would be available. Similarly to the project, the project variant’s impact to emergency vehicle access and circulation would be less than significant under Existing Plus Project conditions.

g. Construction. Construction activities associated with development of the project would generally occur Monday through Friday, between 7:00 a.m. and 5:30 p.m. Construction staging would generally occur on-site. Access to the construction staging areas would be provided via Seaport Boulevard from US 101 to the site via Blomquist Street and Maple Street. Construction truck traffic would be limited to the designated truck routes in Redwood City which include Seaport Boulevard and Blomquist Street. Over the course of the construction phase, construction trucks and workers arriving or departing the site would generate additional vehicle trips on the roadway network. However, due to the timing of typical construction activities, these vehicle trips are generally expected to occur outside of the AM and PM peak periods.

Impact TRA-2: Construction associated with development of the proposed project and the project variant would increase traffic volumes at area intersections and on area freeways, potentially causing temporary increased congestion and/or disruption of vehicle, pedestrian, bicycle and transit circulation. (S)

Project construction would affect off-site circulation due to increased truck traffic to and from the site. The impact of construction truck traffic would be a temporary lessening of the capacities of local streets due to the size, slower acceleration, and larger turning radii of trucks, which may temporarily affect traffic and transit operations and increase traffic, pedestrian, and bicycle conflicts near the project site. Construction activities would not affect air traffic patterns. Construction activities are temporary by nature, and project-related construction activities are not expected to cause a substantial disruption to existing roadway capacity. Additional impacts may result during project construction when there are heavy-duty construction vehicles sharing the roadway with normal vehicle traffic. This can create impacts due to incompatible uses and hazards. However, due to the number of trucks currently accessing the nearby land uses, construction traffic would not change the type of vehicles using the surrounding roadway network. Impacts on transportation and traffic would be temporary in nature and would be less than that after the full build out of the project; however, mitigation is required to reduce this impact to a less-than-significant level. Construction for the project variant is expected to be very similar to that of the project. Construction timelines, staging, access, and logistics would be very similar to that of the project. The project variant would have the same impacts related to construction and would require the same mitigation measures under Existing Plus Project conditions.

Mitigation Measure TRA-2: The project applicant shall develop and submit to the City for approval a construction management plans that specify measures that would reduce impacts to motor vehicle, bicycle, pedestrian, and transit circulation. The City must approve the plans prior to the issuing of a building permit. Construction management plans shall include the following:

- Location of construction staging areas for materials, equipment, and vehicles;
- Notification procedures for adjacent property owners and public safety personnel regarding when major deliveries, detours, and lane closures will occur;
- Identification of haul routes for movement of construction vehicles that would minimize impacts on vehicular, bicycle, and pedestrian traffic, circulation, and safety; and provision for monitoring surface streets used for haul routes so that any damage and debris attributable to the haul trucks can be identified and corrected by the project applicant;
- Provisions for removal of trash generated by project construction activity;
- A process for responding to, and tracking, complaints pertaining to construction activity, including identification of an on-site complaint manager; and
- Provisions for pedestrian, bicycle, and transit circulation through the congestion zone, including maintaining pedestrian and bicycle access between the bridge over Redwood Creek and Blomquist Street sidewalks and bike lanes. (LTS)

h. Parking. Parking related impacts are not considered environmental impacts under CEQA. Therefore, this section is provided for contextual and informational purposes only.

Each townhome unit would include a ground level parking garage that would accommodate one to two vehicles for a total of 262 off-street parking spaces within the project site. Approximately 85 units would include tandem parking. There would be 35 on-street guest parking spaces that would be provided throughout the project and an additional 45 on-street public parking spaces located on Maple Street. There would be two on-street spaces that would be ADA compliant. In the final

detailed site plan designs, the curb radii would be required to be designed to ensure adequate access for trucks, shuttles, and emergency vehicles.

The Redwood City Ordinance requires a minimum of two off-street parking spaces per multiple family dwelling unit, one of which must be a covered space. Additionally there must be one guest or visitor parking space for every four units. These requirements are met as there are 131 dwelling units and 262 off-street parking spaces proposed. Additionally there is a minimum of 33 guest and visitor parking spaces required for the 131 units, which is satisfied by the proposed 35 on-street parking spaces.

The Institute of Transportation Engineers (ITE) Parking Generation guidelines estimates a peak period demand of 175 parking spaces for 131 residential condominium/townhouse units. The project therefore proposes enough spaces to satisfy the ITE estimated peak demand. Table IV.D-12 provides a comparison between proposed and required parking supply.

Parking for the project variant is expected to be identical to that of the project.

Table IV.D-12: Project Parking Supply Comparison

| Parking | Off-Street | On-Street | Total |
|------------------------|------------|-----------|-------|
| Proposed Project | 262 | 80 | 342 |
| Parking Demand | | | |
| Redwood City Ordinance | 262 | 33 | 295 |
| ITE Parking Generation | – | – | 175 |

Source: ITE Parking Generation (4th Edition); Fehr & Peers, 2017.

6. Cumulative Impacts

Cumulative analysis for the project and project variant are the same since the Blomquist Street Extension to East Bayshore Road is included under all Cumulative conditions. This section evaluates the transportation-related impacts of the project under Cumulative conditions. Cumulative conditions represent projected conditions in 2040, comprising traffic estimates for probable future developments and selected roadway system improvements. The Santa Clara Valley Transportation Authority and the San Mateo City/County Association of Governments travel demand model (VTA-C/CAG model) was used to develop forecasts for this study.

a. Forecasting Model Validation. Cumulative (2040) forecasts were developed in coordination with the US 101/SR 84 (Woodside Road) Interchange Improvement Project. The VTA-C/CAG model has a base year of 2013, and land use inputs were developed by interpolating between MTC’s year 2010 travel demand model and Association of Bay Area Government’s (ABAG’s) current year projections. Model validation thresholds from the (current) 2010 California Regional Transportation Plan Guidelines (RTP Guidelines) were used to indicate how well the model results match the existing demand volumes. Adjustments were made to the model, including splitting large TAZs into smaller TAZs, redistributing land uses (households and jobs) to reflect actual traffic loading on to the highway network, and adjusting link capacities to better reflect observed conditions to maintain acceptable validation levels. These validation efforts performed by VTA staff are described in the Draft Travel Demand Forecasting Memorandum for the US 101/SR 84 (Woodside Road) Interchange Improvement Project (Fehr & Peers, 2014) provided in Appendix C.

b. Cumulative Land Use Assumptions. The cumulative land use assumptions include ABAG projections for year 2040 with refinements to reflect under construction, approved, and pending development projects in Redwood City. The 2040 land use assumptions include the Inner Harbor Specific Plan, the recently completed County Jail, development projected in the Downtown Redwood City Precise Plan, Kaiser Hospital Specific Plan, 851 Main, and the Stanford in Redwood City development. Since the IHSP was not approved, trips associated with the added land uses related to the Plan were removed. Once removed, additional trips associated with the General Plan land uses for the plan area were added in so that a reasonable amount of growth (consistent with the General Plan) was accounted for in the study area.

The Redwood City General Plan describes the city's framework for growth between 2010 and 2030, which includes anticipated changes in housing, population, and employment. The General Plan envisioned a mix of residential, commercial office, commercial retail, and low-intensity industrial land uses within the Inner Harbor area. The General Plan growth for the Inner Harbor area includes more residential uses at the project site than is proposed by the project. Therefore, the cumulative conditions with the General Plan build out represents Cumulative Plus Project conditions.

Cumulative No Project conditions include the same land use assumptions to those listed above, with the exception of the land uses associated with the project.

c. Cumulative Roadway Improvements, The 2040 roadway networks contain Tier 1 improvements in the Regional Transportation Plan (RTP) for San Mateo County. The RTP includes the Blomquist Street Extension to East Bayshore Road and the conversion of the US 101/Willow Road interchange to a partial cloverleaf. Additionally, the Blomquist Street Extension to East Bayshore Road is included in Redwood City's TIF program. Both of these improvements are included in the Cumulative conditions analysis with and without the project.

Other on-going studies to improve roadways in the study area include the US 101/SR 84 (Woodside Road) Interchange Improvement Project and the extension of the existing HOV lanes north of Whipple Avenue to the San Mateo/San Francisco county line. However, these projects are not fully funded, and therefore are not included in the Cumulative conditions analysis (with or without the project).

d. Cumulative Traffic Volumes. Intersection peak-hour traffic volume forecasts were developed using the Furnessing Method, which is a link-level adjustment procedure that adds the amount of growth projected by the model proportional to the existing turning movement volumes. For locations where existing counts are very low, or where new roadways are proposed, additional adjustments are made to account for the projected growth to those movements. Intersection peak-hour forecasts along Seaport Boulevard and Blomquist Street include the anticipated growth in truck traffic volumes based on information gathered for the US 101/SR 84 (Woodside Road) Interchange Improvement Project. Mainline forecasts were developed using the difference method, which is a link-level adjustment procedure that adds the amount of growth projected by the model to the existing demand volumes. The following presents the specific steps used to develop Cumulative Plus Project mainline and ramp raw forecasts from the model:

- Step 1** Run the validated base year model to estimate existing AM and PM peak-hour model traffic volumes.
- Step 2** Run the 2040 model to estimate AM and PM peak-hour traffic forecasts.
- Step 3** Develop Cumulative Plus Project raw forecasts using the following formula: Year 2040 Raw Forecasts = Base Year Peak Hour Demand Volume from existing counts + (Year 2040 Model Peak Hour Volume – Base Year Model Peak Hour Volume)
- Step 4** Check for reasonableness and make manual adjustments as necessary to ensure that volumes do not drop below existing levels or grow exponentially unless there is a specific reason.

The Cumulative No Project scenario represents projected conditions from the Cumulative conditions scenario, including the build out of nearby future projects and roadway improvements. To estimate the Cumulative No Project traffic volumes, the AM and PM peak-hour vehicle trips generated by the project were removed from the Cumulative Plus Project traffic volumes. These vehicle trips were removed from the mainline freeway segments, freeway ramps, and intersection turning movements based on the directions of approach and departure consistent with prior analysis. Intersection turning movement volumes for Cumulative No Project and Plus Project conditions are shown on Figures IV.D-7 and IV.D-8, respectively.

e. Cumulative Project Conditions. The project description under cumulative conditions includes the Blomquist Street Extension to East Bayshore Road. With the Full Extension in place, traffic patterns and project site access will change slightly to include more access points.

(1) Cumulative Traffic Hazards. Primary access to the project site would be provided by improving Maple Street north of Blomquist Street and the internal section of Maple Street. Under cumulative conditions, the intersection of Blomquist Street/Maple Street will operate as a roundabout, the Blomquist Street Extension to East Bayshore Road is in place, and minor signal timing changes are incorporated where appropriate based on future demand volumes.

Based on the project description and site plan, the project is not expected to create any additional traffic hazards to the roadway network. The project is not expected to create or worsen any existing conflict between pedestrians, bicycles, transit, vehicles, or trucks. Additionally, all new roadways would be designed in compliance with all Redwood City design guidelines to ensure safe and efficient access. The project's effect on traffic hazards would be less-than-significant under Cumulative Plus Project conditions.

(2) Cumulative Plus Project Traffic Operations. This section evaluates the transportation-related impacts of the project under Cumulative Plus Project Conditions.

Cumulative Vehicle Trip Generation Estimates. Vehicle trip estimates under Cumulative conditions for the project were developed using the same methodologies and sources as under Existing conditions. The project is expected to generate the same number of daily and peak hour vehicle trips as under Existing conditions, as summarized in Table IV.D-7.

Cumulative Vehicle Trip Distribution. Vehicle trips were assigned to the surrounding roadway networks and to study intersections based on similar trip distribution patterns as under existing conditions, but with slight differences based on new trip patterns using the Blomquist Street Extension to East Bayshore Road, as shown in Figure IV.D-7.

(3) Cumulative Plus Project Conditions. The Cumulative Plus Project conditions includes build out of the Blomquist Street Extension to East Bayshore Road, which provides additional access to the project site from East Bayshore Road. The project applicant would be required to contribute their fair share to the improvements identified as part of this project variant.

Cumulative Intersection Operations. The intersection LOS analysis results for Cumulative conditions both with and without the project are presented in Table IV.D-13. As shown in the table, the intersection of Whipple Avenue/US 101 Northbound Off-Ramp (Intersection #2) during the AM and PM peak hours, along with East Bayshore Road/Bair Island Road/Blomquist Street Extension (Intersection #3), Maple Street/Veterans Boulevard (Intersection #4), and Blomquist Street/Maple Street (Intersection #5) during the AM peak hour would continue to operate at an acceptable LOS D or better under Cumulative Conditions with and without the project. The remaining intersections would operate at an unacceptable LOS E or worse during the AM or PM peak hours under Cumulative conditions.

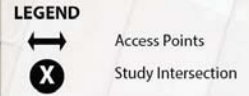
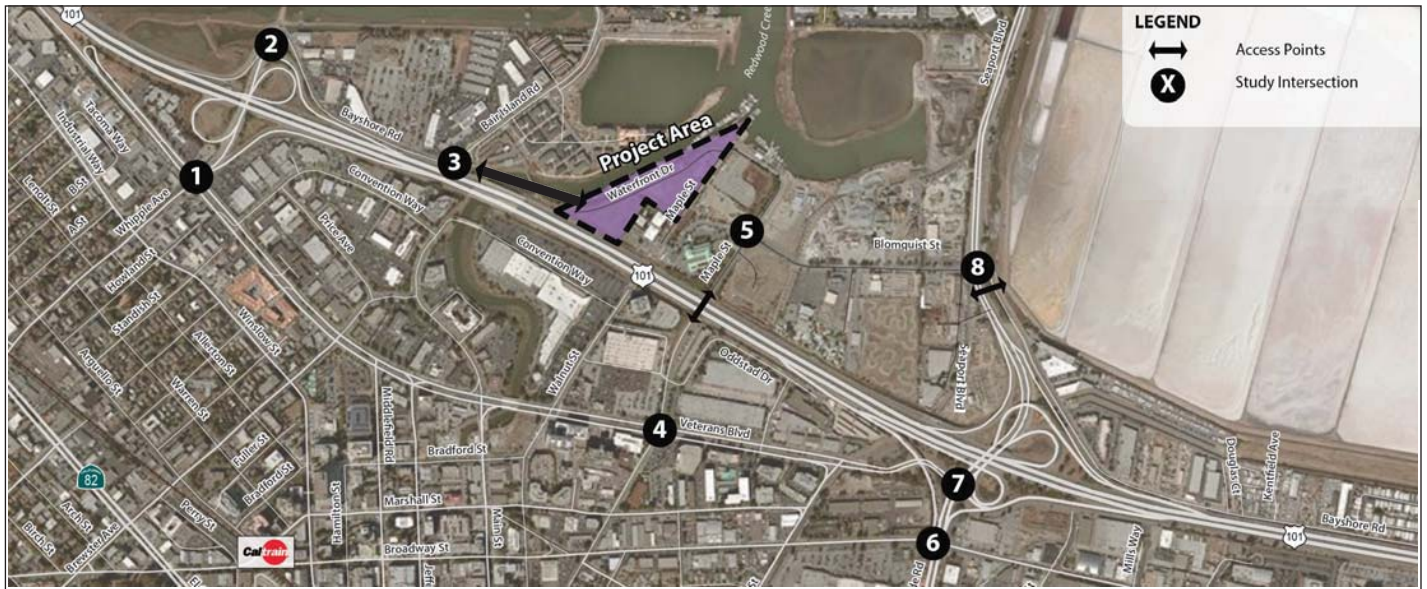
Traffic added by development of the project, in combination with other reasonably foreseeable development would add traffic to intersections currently operating at unacceptable levels or cause intersection operations to degrade from acceptable levels under Cumulative No Project conditions to unacceptable levels under Cumulative Plus Project conditions at the following two study intersections:

6. Broadway/Woodside Road (SR 84)/US 101 SB Off-Ramp (AM Peak Hour)
8. Blomquist Street/Seaport Boulevard/East Bayshore Road (PM Peak Hour)

This is considered a cumulative significant impact at these three locations, as described below.

Impact TRA-3: Development of the proposed project and the project variant, combined with cumulative development in the defined geographic area, including past, present, existing, approved, pending, and reasonably foreseeable future development, would contribute a considerable amount of traffic and increase the average vehicle delay by more than the five seconds at Broadway/Woodside Road/US 101 Southbound Off-Ramp (Intersection #6) during the AM peak hour. (S)

The worsening traffic operations at this location, within the projected LOS F conditions without the project, would be due to the slight increase in traffic along the heavily congested Woodside Road (SR 84) corridor. Therefore, the project's impact at this study intersection would represent a significant cumulative impact.



| 1. Veterans Blvd/Whipple Ave | 2. US 101 NB Off-Ramp/E Bayshore Rd/Whipple Ave | 3. Bair Island Rd/E Bayshore Rd/Blomquist St Ext | 4. Maple St/Veterans Blvd |
|------------------------------|---|--|--|
| | | | |
| 5. Maple St/Blomquist St | 6. Woodside Rd/Broadway | 7. Woodside Rd/Veterans Blvd/101 SB On-Ramp | 8. Seaport Blvd/Blomquist St/E Bayshore Rd |
| | | | |

- Turn Lane
- AM (PM)** Peak Hour Traffic Volume
- Traffic Signal
- Stop Sign
- Roundabout



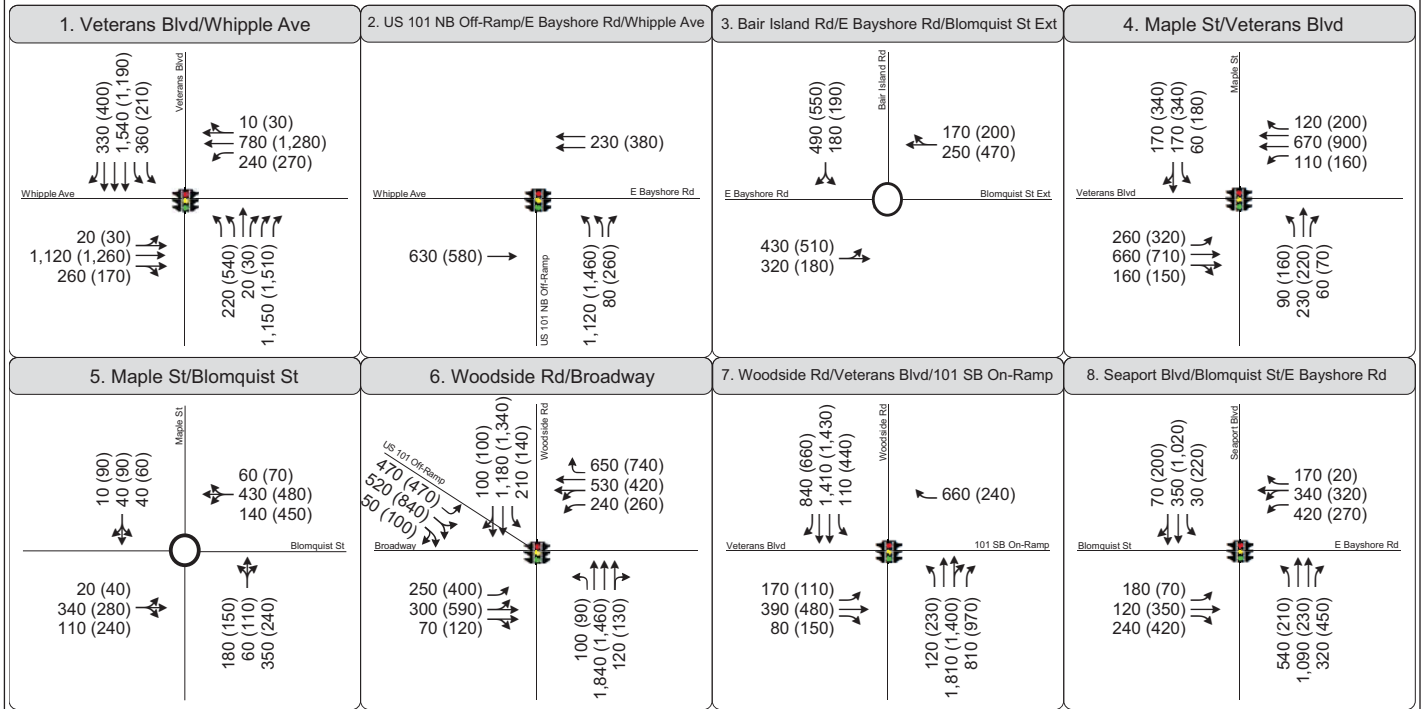
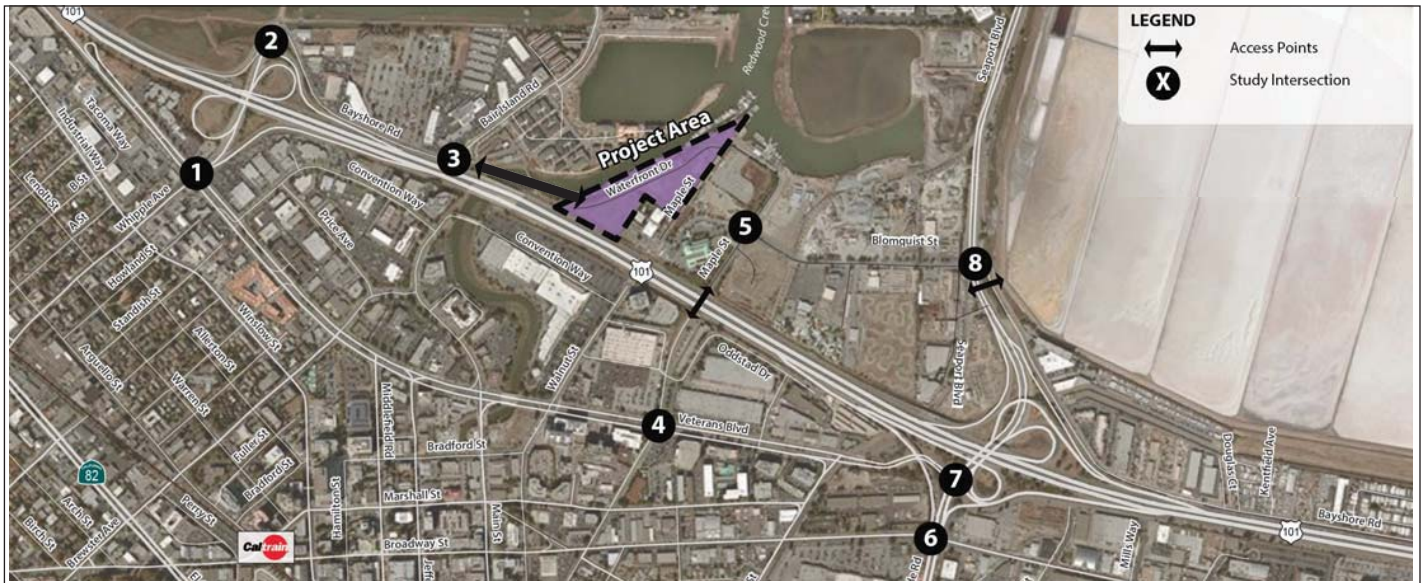
FIGURE IV.D-7



1548 Maple Street Project EIR

Cumulative Peak Hour Traffic Volumes and Lane Configurations

SOURCE: FEHR & PEERS, 2018.
 I:\RWC1401D 1548 Maple St\figures\Fig_IVD7.ai (1/22/18)



- Turn Lane
- AM (PM)** Peak Hour Traffic Volume
- Traffic Signal
- Stop Sign
- Roundabout

LSA

FIGURE IV.D-8



1548 Maple Street Project EIR
 Cumulative Plus Project
 Peak Hour Traffic Volumes and Lane Configurations

SOURCE: FEHR & PEERS, 2018.

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Table IV.D-13: Cumulative Intersection Level of Service (LOS) Results – Project/Project Variant

| Intersection | Traffic Control | Peak Hour | Existing | | Cumulative No Project | | Cumulative Plus Project/Project Variant | | Change in Delay ^c |
|---|---------------------|-----------|--------------------|----------|-----------------------|----------|---|----------|------------------------------|
| | | | Delay ^a | LOS | Delay ^a | LOS | Delay ^a | LOS | Delay ^a |
| 1. Veterans Boulevard/Whipple Avenue | Signal | AM | 39 | D | 66 | E | 66 | E | +0.0 |
| | | PM | 66 | E | > 80 | F | > 80 | F | +0.5 |
| 2. Whipple Avenue/US 101 Northbound Off-Ramp | Signal | AM | 14 | B | 18 | B | 18 | B | - |
| | | PM | 17 | B | 26 | C | 26 | C | - |
| 3. East Bayshore Road/Bair Island Road/Blomquist Street Extension | Roundabout | AM | < 10 | A | 31 | D | 32 | D | - |
| | | PM | <10 | A | 72 | F | 75 | F | +3.6 |
| 4. Maple Street/Veterans Boulevard | Signal | AM | 18 | B | 48 | D | 53 | D | - |
| | | PM | 23 | C | > 80 | F | > 80 | F | +2.0 |
| 5. Blomquist Street/Maple Street ^b | SSSC/ Roundabout | AM | <10 | A | 13 | B | 11 | B | - |
| | | PM | <10 | A | > 80 | F | > 80 | F | -4.3 |
| 6. Broadway/Woodside Road (SR 84)/US 101 Southbound Off-Ramp | Signal | AM | > 80 | F | > 80 | F | > 80 | F | +8.3 |
| | | PM | > 80 | F | > 80 | F | > 80 | F | +2.0 |
| 7. Veterans Boulevard/Woodside Road (SR 84)/US 101 Southbound On-Ramp | Signal | AM | 18 | B | 56 | E | 59 | E | +3.6 |
| | | PM | > 80 | F | > 80 | F | > 80 | F | -7.1 |
| 8. Blomquist Street/Seaport Boulevard/East Bayshore Road | Signal | AM | 28 | C | 77 | E | > 80 | F | +4.4 |
| | | PM | 25 | C | > 80 | F | > 80 | F | +7.6 |

^a For signalized intersections and roundabouts, delay is the weighted average for all movements in seconds per vehicle. For side-street stop controlled (SSSC) intersections, delay is the worst-operating approach delay.

^b SSSC = Side-street stop-control. The City proposed to convert this intersection to a roundabout under Cumulative Conditions.

^c Change in delay is calculated as average delay under Cumulative Plus Project – Cumulative No Project. Change in delay is only shown for intersections operating at unacceptable LOS under Cumulative No Project Conditions. Significance threshold for intersections operating unacceptably is if the Project adds more than five seconds of delay.

Bold = unacceptable LOS. **Shaded** = significant impact.

Source: Fehr & Peers, 2017.

The US 101/SR 84 (Woodside Road) Interchange Project proposes to increase traffic capacity at the interchange and improve intersection operations along the corridor. Fees paid by proposed development projects would help improve traffic conditions by funding needed transportation projects such as the US 101/SR 84 (Woodside Road) Interchange Improvement Project.

Mitigation Measure TRA-3: Additional capacity along the Woodside Road corridor shall be added and improvements to the US 101/SR 84 interchange shall be made pursuant to the US 101/SR 84 Interchange Improvement Project. The project applicant shall contribute its fair share contribution to the improvements. Concurrent with future building permit applications, the City shall ensure that the required fair-share payment has been submitted. (LTS)

Implementation of Mitigation Measure TRA-3 would improve operations at this intersection during the AM peak hour and this impact would be mitigated to a less-than-significant level.

Impact TRA-4: Development of the proposed project and the project variant, combined with cumulative development in the defined geographic area, including past, present, existing, approved, pending, and reasonably foreseeable future development, would contribute a considerable amount of traffic to Blomquist Street/Seaport Boulevard/East Bayshore Road (Intersection #8) and increase the delay by more than the five seconds in the PM peak hour. (S)

To reduce this impact to a less-than-significant level, the existing right-of-way would be required to be restriped to add a second westbound left turn pocket on East Bayshore Road and to extend the existing turn pockets. This modification is included in the Transportation Impact Mitigation Fee (TIF) project list.

Mitigation Measure TRA-4: The existing right-of-way shall be restriped to add a second westbound left turn pocket on East Bayshore Road and to extend the existing turn pockets. This modification is included in the TIF project list. The project applicant shall contribute its fair share to this improvement. Concurrent with future building permit applications, the City shall ensure that the required transportation impact mitigation fee has been submitted. (LTS)

Implementation of Mitigation Measure TRA-4 would improve operations at this intersection during the PM peak hour. While this intersection would continue to operate at an unacceptable LOS, the change in the delay from Cumulative No Project conditions would be reduced to less than five seconds. Therefore, implementation of this mitigation measure would result in a less-than-significant impact under Cumulative Plus Project conditions.

At all other intersections, traffic added by the development under the project would increase vehicle delay by less than the five-second threshold of significance. Therefore, the project's contribution to these intersections is less-than-significant and no mitigation is required at these locations.

Cumulative Freeway Operations. The cumulative freeway mainline and ramp operations under the Cumulative No Project and Plus Project conditions are presented in Tables IV.D-14 and IV.D-15. Cumulative growth not associated with the project would cause all of the segments to operate at LOS E or F under Cumulative No Project conditions. The project would not contribute traffic that exceeds one percent of the mainline capacity to freeway ramps and mainline segments operating over capacity (LOS F) under Cumulative No Project conditions and therefore are not considered significant impacts.

As shown in Table IV.D-14, project added traffic does not represent greater than one percent of segment capacity on any freeway segment under cumulative conditions. Therefore, impacts to freeway mainline segments would be less-than-significant under Cumulative Plus Project conditions.

As shown in Table IV.D-15, project added traffic does not represent greater than five percent of ramp capacity on any freeway ramp under cumulative conditions. Therefore, impacts to freeway ramps would be less-than-significant under Cumulative Plus Project conditions.

f. Cumulative Air Traffic Patterns. As previously discussed, the proposed project's effects on air traffic patterns would be less-than-significant under Existing Plus Project conditions. The project's effect on air traffic patterns would also be less-than-significant under Cumulative Plus Project conditions.

g. Cumulative Public Transit. The project would have the same impact on public transit under cumulative conditions as under existing conditions. The project would not create new potential conflicts between various transit modes and would not conflict with existing plans for transit service in the area. Therefore, the project's impact to transit service would be less-than-significant under Cumulative Plus Project conditions.

h. Cumulative Pedestrian and Bicycle. The project would result in the same marginal increase in pedestrian and bicycle activity under cumulative conditions as under Existing conditions and would provide the same pedestrian and bicycle facilities. The project would not create new potential conflicts between various modes and would not conflict with existing plans for pedestrian and bicycle facilities service in the area. Therefore, the project's impact to pedestrians and bicycle facilities would be less-than-significant under Cumulative Plus Project conditions.

i. Cumulative Emergency Vehicle Access and Circulation. Under Cumulative conditions, emergency vehicle access to the project site would be similar to under Existing conditions, with additional emergency vehicle access point through Blomquist Street to the project site. Under current traffic conditions, it takes approximately three minutes to access the site from this fire station during the PM peak hour, which is less than the City's standard for emergency response time (five minutes or less for 85 percent of all calls).

Table IV.D-14: Cumulative Freeway Segment Level of Service (LOS) Results

| Segment | Peak Hour | Direction | Existing | | Cumulative No Project | | | Cumulative Plus Project/Project Variant | | | | |
|--|-----------|-----------|------------------|-----|-----------------------|------------------|----------|---|----------------------------|--------|------------------|----------|
| | | | V/C ^a | LOS | Volume | V/C ^a | LOS | Added Trips | % of Capacity ^b | Volume | V/C ^a | LOS |
| A. US 101, Marsh Road to Woodside Road (SR 84) | AM | NB | 0.89 | E | 10,286 | 1.12 | F | 13 | 0.1% | 10,299 | 1.12 | F |
| | | SB | 0.98 | E | 11,394 | 1.24 | F | 3 | 0.0% | 11,397 | 1.24 | F |
| | PM | NB | 0.84 | D | 9,339 | 1.02 | F | 9 | 0.1% | 9,348 | 1.02 | F |
| | | SB | 0.88 | D | 10,304 | 1.12 | F | 13 | 0.1% | 10,317 | 1.12 | F |
| B. US 101, Woodside Road (SR 84) to Whipple Avenue | AM | NB | 0.92 | E | 9,255 | 1.06 | F | 1 | 0.0% | 9,256 | 1.06 | F |
| | | SB | 0.93 | E | 10,414 | 1.20 | F | 11 | 0.1% | 10,425 | 1.20 | F |
| | PM | NB | 0.83 | D | 8,404 | 0.97 | E | 4 | 0.0% | 8,408 | 0.97 | E |
| | | SB | 0.86 | D | 9,694 | 1.11 | F | 5 | 0.1% | 9,699 | 1.11 | F |
| C. US 101, Whipple Avenue to Holly Street | AM | NB | 0.98 | E | 9,586 | 1.10 | F | 4 | 0.0% | 9,590 | 1.10 | F |
| | | SB | 0.90 | E | 10,118 | 1.16 | F | 22 | 0.3% | 10,140 | 1.17 | F |
| | PM | NB | 0.82 | D | 8,540 | 0.98 | E | 16 | 0.2% | 8,556 | 0.98 | E |
| | | SB | 0.89 | E | 9,777 | 1.12 | F | 10 | 0.1% | 9,787 | 1.12 | F |

Bold = exceeds CMP LOS standard. **Shaded** = significant impact.
Source: Fehr & Peers, April 2017.

Table IV.D-15: Cumulative Freeway Ramp LOS Results

| Freeway Interchange and Ramp | | Peak Hour | Existing | | Cumulative No Project | | | Cumulative Plus Project/Project Variant | | | | |
|------------------------------|--|-----------|------------------|-----|-----------------------|------------------|----------|---|----------------------------|--------|------------------|----------|
| | | | V/C ^a | LOS | Volume | V/C ^a | LOS | Added Trips | % of Capacity ^b | Volume | V/C ^a | LOS |
| US 101/Woodside Road | | | | | | | | | | | | |
| NB | Off-Ramp to Woodside Road | AM | 0.86 | D | 2,326 | 1.16 | F | 3 | 0.2% | 2,329 | 1.16 | F |
| | | PM | 0.62 | C | 1,588 | 0.79 | D | 12 | 0.6% | 1,600 | 0.80 | D |
| | On-Ramp from WB Seaport Blvd. | AM | 0.15 | A | 450 | 0.25 | A | 0 | 0.0% | 450 | 0.25 | A |
| | | PM | 0.32 | B | 580 | 0.32 | B | 0 | 0.0% | 580 | 0.32 | B |
| | On-Ramp from EB Woodside Road | AM | 0.61 | C | 1,200 | 0.67 | C | 0 | 0.0% | 1,200 | 0.67 | C |
| | | PM | 0.48 | B | 1,050 | 0.58 | C | 0 | 0.0% | 1,050 | 0.58 | C |
| SB | Off-Ramp to EB Seaport Boulevard | AM | 0.29 | A | 660 | 0.37 | B | 0 | 0.0% | 660 | 0.37 | B |
| | | PM | 0.09 | A | 240 | 0.13 | A | 0 | 0.0% | 240 | 0.13 | A |
| | Off-Ramp to WB Woodside Road | AM | 0.44 | B | 1,040 | 0.52 | C | 0 | 0.0% | 1,040 | 0.52 | C |
| | | PM | 0.50 | C | 1,410 | 0.71 | C | 0 | 0.0% | 1,410 | 0.71 | C |
| | On-Ramp from Woodside Road | AM | 0.47 | B | 1,310 | 0.66 | C | 11 | 0.6% | 1,321 | 0.66 | C |
| | | PM | 0.62 | C | 1,890 | 0.95 | E | 5 | 0.3% | 1,895 | 0.95 | E |
| US 101/Whipple Avenue | | | | | | | | | | | | |
| NB | Off-Ramp to Whipple Avenue | AM | 0.51 | C | 1,200 | 0.60 | C | 1 | 0.1% | 1,201 | 0.60 | C |
| | | PM | 0.64 | C | 1,720 | 0.86 | D | 4 | 0.2% | 1,724 | 0.86 | D |
| | On-Ramp from EB Whipple Avenue | AM | 0.57 | C | 1,168 | 0.65 | C | 0 | 0.0% | 1,168 | 0.65 | C |
| | | PM | 0.51 | C | 1,483 | 0.82 | D | 0 | 0.0% | 1,483 | 0.82 | D |
| | On-Ramp from WB Whipple Avenue | AM | 0.08 | A | 200 | 0.22 | A | 13 | 1.4% | 213 | 0.24 | A |
| | | PM | 0.08 | A | 370 | 0.41 | B | 9 | 1.0% | 379 | 0.42 | B |
| SB | Off-Ramp to Veterans Ave./Whipple Ave. | AM | 0.45 | B | 2,108 | 0.55 | C | 3 | 0.1% | 2,111 | 0.56 | C |
| | | PM | 0.36 | B | 1,532 | 0.40 | B | 13 | 0.3% | 1,545 | 0.41 | B |
| | On-Ramp from WB Whipple Avenue | AM | 0.06 | A | 243 | 0.27 | A | 11 | 1.2% | 254 | 0.28 | A |
| | | PM | 0.18 | A | 239 | 0.27 | A | 5 | 0.6% | 244 | 0.27 | A |
| | On-Ramp from EB Whipple Avenue | AM | 0.30 | A | 812 | 0.41 | B | 0 | 0.0% | 812 | 0.41 | B |
| | | PM | 0.27 | A | 863 | 0.43 | B | 0 | 0.0% | 863 | 0.43 | B |

^a V/C = Volume to Capacity ratio

^b Percent of Capacity; A theoretical capacity of 2,000 vehicles per hour (vph) is used for diagonal ramps and 1,800 vph is used for loop ramps.

NB = Northbound US 101; SB = Southbound US 101

Bold = unacceptable LOS. **Shaded** = significant impact.

Source: Fehr & Peers, April 2017.

Development of the project would result in increased traffic congestion and delay at study intersections under Cumulative Plus Project conditions. This additional traffic congestion could potentially slow emergency response and evacuation. However, as shown in Table IV.D-16, traffic congestion along northbound Maple Street would not worsen emergency travel times beyond the City’s threshold. For the above reasons, development of the project and the project variant would not result in inadequate emergency access; the impact would be less-than-significant under Cumulative Plus Project conditions.

Table IV.D-16: PM Peak Hour Estimated Emergency Response Times – Cumulative

| Study Intersection | Reported Vehicle Delay on Northbound Maple Street | |
|---|---|---|
| | Existing | Cumulative Plus Project/ Project Variant |
| 4. Maple Street/Veterans Blvd | 0:18 | 0:38 |
| 5. Blomquist Street/Maple Street | 0:02 | 0:54 |
| <i>Increased Travel Time</i> | – | +1:12 |
| Estimated Travel Time ^a | 3:00 | 4:12 |

^a Estimated travel time based on a review of Google maps during peak hours of congestion during the day. These estimates do not account for the fact that fire department vehicles could bypass vehicle queues and red lights. Actual travel times may vary.
 Source: Fehr & Peers, 2017.

j. Cumulative Construction. Construction activities associated with development of the project would be temporary in nature. All construction associated with the project is expected to be completed prior to the 2040 cumulative horizon year and therefore not relevant under cumulative conditions.

k. Cumulative Parking. Parking provided for the project would be identical under cumulative conditions as to existing conditions. The project proposes enough spaces to satisfy the ITE estimated peak demand and Redwood City parking ordinance. Table IV.D-12 provides a comparison between proposed and required parking supply.

E. AIR QUALITY

This section has been prepared using methodologies and assumptions recommended in the air quality impact assessment guidelines of the Bay Area Air Quality Management District (BAAQMD).¹ In keeping with these guidelines, this section describes existing air quality, impacts of the project on local carbon monoxide (CO) levels, impacts of vehicular emissions that have regional effects, and exposure of sensitive receptors to toxic air contaminants (TACs). Potential impacts would be the same for the proposed project and the project variant; therefore, these impacts are not differentiated in this section. Mitigation measures to reduce or eliminate potentially significant air quality impacts are identified, where appropriate. Air quality modeling results are included in Appendix D.

1. Setting

The following discussion provides an overview of existing air quality conditions in the region and in the City of Redwood City. Ambient air quality standards and the regulatory framework are summarized and climate, air quality conditions, and typical air pollutant types and sources are also described.

a. Air Pollutants and Health Effects. Both State and federal governments have established health-based Ambient Air Quality Standards (AAQS) for six criteria air pollutants: carbon monoxide (CO), ozone (O₃), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), lead (Pb), and suspended particulate matter (PM). In addition, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride and visibility-reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety. Two criteria pollutants, O₃ and NO₂, are considered regional pollutants because they (or their precursors) affect air quality on a regional scale. Pollutants such as CO, SO₂, and Pb are considered local pollutants that tend to accumulate in the air locally.

The primary pollutants of concern in the project area are O₃, CO, and PM. Significance thresholds established by an air district are used to manage total regional and local emissions within an air basin based on the air basin's attainment status for criteria pollutants. These emission thresholds were established for individual development projects that would contribute to regional and local emissions and could adversely affect or delay the air basin's projected attainment target goals for nonattainment criteria pollutants.

Because of the conservative nature of the significance thresholds, and the basin-wide context of individual development project emissions, there is no direct correlation between a single project and localized air quality-related health effects. One individual project that generates emissions exceeding a threshold does not necessarily result in adverse health effects for residents in the project vicinity. This condition is especially true when the criteria pollutants exceeding thresholds are those with regional effects, such as ozone precursors like nitrogen oxides (NO_x) and reactive organic gases (ROG).

Occupants of facilities such as schools, daycare centers, parks and playgrounds, hospitals, and nursing and convalescent homes are considered to be more sensitive than the general public to air pollutants because these population groups have increased susceptibility to respiratory disease. Persons engaged

¹ Bay Area Air Quality Management District, 2017. *CEQA Air Quality Guidelines*. May.

in strenuous work or exercise also have increased sensitivity to poor air quality. Residential areas are considered more sensitive to air quality conditions, compared to commercial and industrial areas, because people generally spend longer periods of time at their residences, with greater associated exposure to ambient air quality conditions. Recreational uses are also considered sensitive compared to commercial and industrial uses due to greater exposure to ambient air quality conditions associated with exercise.

Air pollutants and their health effects, and other air pollution-related considerations are summarized in Table IV.E-1 and are described in more detail below.

Table IV.E-1: Sources and Health Effects of Air Pollutants

| Pollutants | Sources | Primary Effects |
|--|---|---|
| Carbon Monoxide (CO) | <ul style="list-style-type: none"> • Incomplete combustion of fuels and other carbon-containing substances, such as motor exhaust. • Natural events, such as decomposition of organic matter. | <ul style="list-style-type: none"> • Reduced tolerance for exercise. • Impairment of mental function. • Impairment of fetal development. • Death at high levels of exposure. • Aggravation of some heart diseases (angina). |
| Nitrogen Dioxide (NO ₂) | <ul style="list-style-type: none"> • Motor vehicle exhaust. • High temperature stationary combustion. • Atmospheric reactions. | <ul style="list-style-type: none"> • Aggravation of respiratory illness. • Reduced visibility. • Reduced plant growth. • Formation of acid rain. |
| Ozone (O ₃) | <ul style="list-style-type: none"> • Atmospheric reaction of organic gases with nitrogen oxides in sunlight. | <ul style="list-style-type: none"> • Aggravation of respiratory and cardiovascular diseases. • Irritation of eyes. • Impairment of cardiopulmonary function. • Plant leaf injury. |
| Lead (Pb) | <ul style="list-style-type: none"> • Contaminated soil. | <ul style="list-style-type: none"> • Impairment of blood functions and nerve construction. • Behavioral and hearing problems in children. |
| Suspended Particulate Matter (PM _{2.5} and PM ₁₀) | <ul style="list-style-type: none"> • Stationary combustion of solid fuels. • Construction activities. • Industrial processes. • Atmospheric chemical reactions. | <ul style="list-style-type: none"> • Reduced lung function. • Aggravation of the effects of gaseous pollutants. • Aggravation of respiratory and cardiorespiratory diseases. • Increased cough and chest discomfort. • Soiling. • Reduced visibility. |
| Sulfur Dioxide (SO ₂) | <ul style="list-style-type: none"> • Combustion of sulfur-containing fossil fuels. • Smelting of sulfur-bearing metal ores. • Industrial processes. | <ul style="list-style-type: none"> • Aggravation of respiratory diseases (asthma, emphysema). • Reduced lung function. • Irritation of eyes. • Reduced visibility. • Plant injury. • Deterioration of metals, textiles, leather, finishes, coatings, etc. |

Source: California Air Resources Board (ARB), 2015.

(1) **Ozone (O₃).** Ozone is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving ROG and NO_x. The main sources of ROG and NO_x, often referred to as ozone precursors, are combustion processes (including combustion in motor vehicle engines) and the evaporation of solvents, paints, and fuels. In the Bay Area, automobiles are the single largest source of ozone precursors. Ozone is referred to as a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production through the photochemical reaction process. Ozone causes eye irritation, airway constriction, and shortness of breath and can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema.

(2) **Carbon Monoxide (CO).** CO is an odorless, colorless gas usually formed as the result of the incomplete combustion of fuels. The single largest source of CO is motor vehicles. CO transport is limited - it disperses with distance from the source under normal meteorological conditions. However, under certain extreme meteorological conditions, CO concentrations near congested roadways or intersections may reach unhealthful levels that adversely affect local sensitive receptors (e.g., residents, schoolchildren, the elderly, and hospital patients). Typically, high CO concentrations are associated with roadways or intersections operating at unacceptable levels of service (LOS) or with extremely high traffic volumes. Exposure to high concentrations of CO reduces the oxygen-carrying capacity of the blood and can cause headaches, nausea, dizziness, and fatigue, impair central nervous system function, and induce angina (chest pain) in persons with serious heart disease. Extremely high levels of CO, such as those generated when a vehicle is running in an unventilated garage, can be fatal.

(3) **Particulate Matter (PM).** Particulate matter is a class of air pollutants that consists of heterogeneous solid and liquid airborne particles from manmade and natural sources. Particulate matter is categorized in two size ranges: PM₁₀ for particles less than 10 microns in diameter and PM_{2.5} for particles less than 2.5 microns in diameter. In the Bay Area, motor vehicles generate about half of the air basin's particulates, through tailpipe emissions as well as brake pad, tire wear, and entrained road dust. Wood burning in fireplaces and stoves, industrial facilities, and ground-disturbing activities such as construction are other sources of such fine particulates. These fine particulates are small enough to be inhaled into the deepest parts of the human lung and can cause adverse health effects. According to the California Air Resources Board (ARB), studies in the United States and elsewhere have demonstrated a strong link between elevated particulate levels and premature deaths, hospital admissions, emergency room visits, and asthma attacks, and studies of children's health in California have demonstrated that particle pollution may significantly reduce lung function growth in children. The ARB also reports that Statewide attainment of particulate matter standards could prevent thousands of premature deaths, lower hospital admissions for cardiovascular and respiratory disease and asthma-related emergency room visits, and avoid hundreds of thousands of episodes of respiratory illness in California.²

(4) **Nitrogen Dioxide (NO₂).** NO₂ is a reddish brown gas that is a byproduct of combustion processes. Automobiles and industrial operations are the main sources of NO₂. Aside from its contribution to ozone formation, NO₂ also contributes to other pollution problems, including a high concentration of fine particulate matter, poor visibility, and acid deposition. NO₂ may be visible as a

² California Air Resources Board, 2011. *Fact Sheets*. Website: www.arb.ca.gov/html/brochure/pm10.htm (accessed November 2, 2017). October.

coloring component on high pollution days, especially in conjunction with high ozone levels. NO₂ decreases lung function and may reduce resistance to infection.

(5) Sulfur Dioxide (SO₂). SO₂ is a colorless acidic gas with a strong odor. It is produced by the combustion of sulfur-containing fuels such as oil, coal, and diesel. SO₂ has the potential to damage materials and can cause health effects at high concentrations. It can irritate lung tissue and increase the risk of acute and chronic respiratory disease. SO₂ also reduces visibility and the level of sunlight at the ground surface.

(6) Lead. Lead is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. As a result of the phase-out of leaded gasoline, metal processing is currently the primary source of lead emissions. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery factories.

Twenty years ago, mobile sources were the main contributor to ambient lead concentrations in the air. In the early 1970s, the United States Environmental Protection Agency (USEPA) established national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. The USEPA banned the use of leaded gasoline in highway vehicles in December 1995. As a result of the USEPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector and levels of lead in the air decreased dramatically.

(7) Toxic Air Contaminants. In addition to the criteria pollutants discussed above, toxic air contaminants (TACs) are another group of pollutants of concern. Some examples of TACs include: benzene, butadiene, formaldehyde, and hydrogen sulfide. Potential human health effects of TACs include birth defects, neurological damage, cancer, and death. There are hundreds of different types of TACs with varying degrees of toxicity. Individual TACs vary greatly in the health risk they present; at a given level of exposure, one TAC may pose a hazard that is many times greater than another.

TACs do not have ambient air quality standards, but are regulated by the USEPA and ARB. In 1998, ARB identified particulate matter from diesel-fueled engines as a toxic air contaminant. ARB has completed a risk management process that identified potential cancer risks for a range of activities and land uses that are characterized by use of diesel-fueled engines.³ High volume freeways, stationary diesel engines, and facilities attracting heavy and constant diesel vehicle traffic (distribution centers, truck stops) were identified as posing the highest risk to adjacent receptors. Other facilities associated with increased risk include warehouse distribution centers, large retail or industrial facilities, high volume transit centers, and schools with a high volume of bus traffic. Health risks from TACs are a function of both concentration and duration of exposure.

³ California Air Resources Board, 2000. *Fact Sheet – California's Plan to Reduce Diesel Particulate Matter Emissions*. Available online at: www.arb.ca.gov/diesel/factsheets/rrpfactsheet.pdf (accessed November 2, 2017). October.

The BAAQMD regulates TACs using a risk-based approach. This approach uses a health risk assessment to determine what sources and pollutants to control as well as the degree of control. A health risk assessment is an analysis in which human health exposure to toxic substances is estimated, and considered together with information regarding the toxic potency of the substances, in order to provide a quantitative estimate of health risks.⁴ As part of ongoing efforts to identify and assess potential health risks to the public, the BAAQMD has collected and compiled air toxics emissions data from industrial and commercial sources of air pollution throughout the Bay Area. Monitoring data and emissions inventories of TACs help the BAAQMD determine health risk to Bay Area residents.

Ambient monitoring concentrations of TACs indicate that pollutants emitted primarily from motor vehicles (1,3-butadiene and benzene) account for slightly over 50 percent of the average calculated cancer risk from ambient air in the Bay Area.⁵ According to the BAAQMD, ambient benzene levels declined dramatically in 1996 with the advent of Phase 2 reformulated gasoline. Due to this reduction, the calculated average cancer risk based on monitoring results has been reduced to 143 in 1,000,000; however, this risk does not include the risk resulting from exposure to diesel particulate matter or other compounds not monitored.

Unlike TACs emitted from industrial and other stationary sources noted above, most diesel particulate matter is emitted from mobile sources – primarily “off-road” sources such as construction and mining equipment, agricultural equipment, and truck-mounted refrigeration units, as well as trucks and buses traveling on freeways and local roadways. Agricultural and mining equipment is not commonly used in urban parts of the Bay Area, while construction equipment typically operates for a limited time at various locations. As a result, the readily identifiable locations where diesel particulate matter is emitted in the Bay Area include high-traffic roadways and other areas with substantial truck traffic. Although not specifically monitored, recent studies indicate that exposure to diesel particulate matter may contribute significantly to a cancer risk (a risk of approximately 500 to 700 in 1,000,000) that is greater than all other measured TACs combined.⁶ The ARB's Diesel Risk Reduction Plan is intended to substantially reduce diesel particulate matter emissions and associated health risks through introduction of ultra-low-sulfur diesel fuel – a step already implemented – and cleaner-burning diesel engines. The technology for reducing diesel particulate matter emissions from heavy-duty trucks is well established, and both State and federal agencies are moving aggressively to regulate engines and emission control systems to reduce and remediate diesel emissions. ARB anticipates that by 2020 average Statewide diesel particulate matter concentrations will decrease by 85 percent from levels in 2000 with full implementation of the Diesel Risk Reduction Plan, meaning that the Statewide health risk from diesel particulate matter is expected to decrease from 540 cancer cases in 1,000,000 to 21.5 cancer cases in 1,000,000. It is likely that the Bay Area cancer risk from diesel particulate matter will decrease by a similar factor by 2020.

⁴ In general, a health risk assessment is required if the BAAQMD concludes that projected emissions of a specific air toxic compound from a proposed new or modified source suggests a potential public health risk. Such an assessment generally evaluates chronic, long term effects, including the increased risk of cancer as a result of exposure to one or more TACs.

⁵ Bay Area Air Quality Management District, 2015. *Toxic Air Contaminant Control Program Annual Report, Volume 1*. Website: www.baaqmd.gov/research-and-data/air-toxics/annual-report (accessed November 2, 2017). May.

⁶ Ibid.

(8) High Volume Roadways. Air pollutant exposures and their associated health burdens vary considerably within places in relation to sources of air pollution. Motor vehicle traffic is perhaps the most important source of intra-urban spatial variation in air pollution concentrations. Air quality research consistently demonstrates that pollutant levels are substantially higher near freeways and busy roadways, and human health studies have consistently demonstrated that children living within 100 to 200 meters (328 to 656 feet) of freeways or busy roadways have reduced lung function and higher rates of respiratory disease. At present, it is not possible to attribute the effects of roadway proximity on non-cancer health effects to one or more specific vehicle types or vehicle pollutants. Engine exhaust, from diesel, gasoline, and other combustion engines, is a complex mixture of particles and gases, with collective and individual toxicological characteristics.

b. Existing Climate and Air Quality. The following provides a discussion of the local and regional air quality and climate in the City of Redwood City.

(1) Regional and Local Air Quality Conditions. The proposed project is located within the City of Redwood City, which is in San Mateo County. San Mateo County lies in the middle of the San Francisco peninsula, south of San Francisco County, and north of Santa Clara and Santa Cruz counties. It is bounded by the Pacific Ocean to the west and San Francisco Bay to the east.

Cool, foggy weather is prevalent along the western coast of the peninsula, particularly during the summer. Summertime average daily temperatures are moderate along the west coast and warm on the county's east side. In the winter, average daily temperatures across the county range from mild to moderate. Winds are mild, with the highest wind speeds focused along the western coast. Rainfall averages about 20 to 25 inches per year at lower elevations and up to 36 inches in the Santa Cruz Mountains.⁷

Ozone and fine particle pollution, or PM_{2.5}, are the major regional air pollutants of concern in the San Francisco Bay Area. Ozone is primarily a problem in the summer, and fine particle pollution in the winter.⁸

In San Mateo County, ozone almost never exceeds health standards, and PM_{2.5} exceeds the national standard only on about one day each year. San Mateo County frequently receives fresh marine air from the Pacific Ocean, which passes over the coastal hills. In winter, PM_{2.5} may be transported into San Mateo County from other parts of the Bay Area, adding to wood smoke, which may lead to elevated concentrations, but these are rarely high enough to exceed health standards.⁹

Air quality is a function of both local climate and local sources of air pollution. Air quality is the balance of the natural dispersal capacity of the atmosphere and emissions of air pollutants from human uses of the environment. Air quality conditions in the San Francisco Bay Area have improved significantly since the BAAQMD was created in 1955. Ambient concentrations of air pollutants and the number of days during which the region exceeds air quality standards have fallen dramatically.

⁷ Bay Area Air Quality Management District, 2016. *San Mateo County Climate*. April 25.

⁸ Ibid.

⁹ Ibid.

Exceedances of air quality standards occur primarily during meteorological conditions conducive to high pollution levels, such as cold, windless winter nights or hot, sunny summer afternoons.

Ozone levels, measured by peak concentrations and the number of days over the State 1-hour standard, have declined substantially as a result of aggressive programs by the BAAQMD and other regional, State and federal agencies. The reduction of peak concentrations represents progress in improving public health; however the Bay Area still exceeds the State standard for 1-hour ozone as well as the State and federal 8-hour standards. Levels of PM₁₀ have exceeded State standards two of the last three years, and the area is considered a nonattainment area for this pollutant relative to the State standards. The Bay Area is an unclassified area for the federal PM₁₀ standard.

No exceedances of the State or federal CO standards have been recorded at any of the region's monitoring stations since 1991. The Bay Area is currently considered a maintenance area for State and federal CO standards.

(2) Attainment Status Designations. The ARB is required to designate areas of the State as attainment, nonattainment or unclassified for all State standards. An *attainment* designation for an area signifies that pollutant concentrations did not violate the standard for that pollutant in that area. A *nonattainment* designation indicates that a pollutant concentration violated the standard at least once, excluding those occasions when a violation was caused by an exceptional event, as defined in the criteria. An *unclassified* designation signifies that data does not support either an attainment or nonattainment status. The California Clean Air Act divides districts into moderate, serious, and severe air pollution categories, with increasingly stringent control requirements mandated for each category.

The USEPA also designates areas as attainment, nonattainment, or classified. Table IV.E-2 provides a summary of the attainment status for the San Francisco Bay Area with respect to national and State ambient air quality standards.

(3) Air Quality Monitoring Results. Air quality monitoring stations are located throughout the nation and maintained by the local air pollution control district and state air quality regulating agencies. Ambient air data collected at permanent monitoring stations are used by the USEPA to identify regions as attainment or nonattainment depending on whether the regions met the requirements stated in the primary National Ambient Air Quality Standards (NAAQS). Attainment areas are required to maintain their status through moderate, yet effective air quality maintenance plans. Nonattainment areas are imposed with additional restrictions as required by the USEPA. In addition, different classifications of attainment such as marginal, moderate, serious, severe, and extreme are used to classify each air basin in the state on a pollutant-by-pollutant basis. Different classifications have different mandated attainment dates and are used as guidelines to create air quality management strategies to improve air quality and comply with the NAAQS by the attainment date. A region is determined to be unclassified when the data collected from the air quality monitoring stations do not support a designation of attainment or nonattainment, due to lack of information, or a conclusion cannot be made with the available data.

Table IV.E-2: San Francisco Bay Area Basin Attainment Status

| | Averaging Time | California Standards ^a | | National Standards ^b | |
|--|------------------------|---------------------------------------|----------------------------|---------------------------------------|-----------------------------|
| | | Concentration | Attainment Status | Concentration ^c | Attainment Status |
| Ozone (O₃) | 8-Hour | 0.070 ppm (137 µg/m ³) | Nonattainment ^h | 0.075 ppm | Nonattainment ^d |
| | 1-Hour | 0.09 ppm (180 µg/m ³) | Nonattainment | Not Applicable | Not Applicable ^e |
| Carbon Monoxide (CO) | 8-Hour | 9.0 ppm (10 mg/m ³) | Attainment | 9 ppm (10 mg/m ³) | Attainment ^f |
| | 1-Hour | 20 ppm (23 mg/m ³) | Attainment | 35 ppm (40 mg/m ³) | Attainment |
| Nitrogen Dioxide (NO₂) | 1-Hour | 0.18 ppm (339 µg/m ³) | Attainment | 0.100 ppm | Unclassified |
| | Annual Arithmetic Mean | 0.030 ppm (57 µg/m ³) | Not Applicable | 0.053 ppm (100 µg/m ³) | Attainment |
| Sulfur Dioxide (SO₂) | 24-Hour | 0.04 ppm (105 µg/m ³) | Attainment | 0.14 ppm (365 µg/m ³) | Attainment |
| | 1-Hour | 0.25 ppm (655 µg/m ³) | Attainment | 0.075 ppm (196 µg/m ³) | Attainment |
| | Annual Arithmetic Mean | Not Applicable | Not Applicable | 0.030 ppm (80 µg/m ³) | Attainment ^j |
| Coarse Particulate Matter (PM₁₀) | Annual Arithmetic Mean | 20 µg/m ³ | Nonattainment ^g | Not Applicable | Not Applicable |
| | 24-Hour | 50 µg/m ³ | Nonattainment | 150 µg/m ³ | Unclassified |
| Fine Particulate Matter (PM_{2.5}) | Annual Arithmetic Mean | 12 µg/m ³ | Nonattainment ^g | 15 µg/m ³ | Attainment |
| | 24-Hour | Not Applicable | Not Applicable | 35 µg/m ³ ¹ | Nonattainment |

^a California standards for ozone, carbon monoxide (except in the Lake Tahoe air basin), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, suspended particulate matter – PM₁₀, and visibility reducing particles are values that are not to be exceeded. The standards for sulfates, Lake Tahoe carbon monoxide, lead, hydrogen sulfide, and vinyl chloride are not to be equaled or exceeded. If the standard is for a 1-hour, 8-hour or 24-hour average (i.e., all standards except for lead and the PM₁₀ annual standard), then some measurements may be excluded. In particular, measurements are excluded that ARB determines would occur less than once per year on average. The Lake Tahoe CO standard is 6.0 ppm, a level one-third the national standard and two-thirds the State standard.

^b National standards shown are the “primary standards” designed to protect public health. National standards other than for ozone, particulates and those based on annual averages are not to be exceeded more than once a year. The 1-hour ozone standard is attained if, during the most recent three-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than 1. The 8-hour ozone standard is attained when the three-year average of the fourth highest daily concentrations is 0.075 ppm (75 ppb) or less. The 24-hour PM₁₀ standard is attained when the three-year average of the 99th percentile of monitored concentrations is less than 150 µg/m³. The 24-hour PM_{2.5} standard is attained when the three-year average of 98th percentiles is less than 35 µg/m³. Except for the national particulate standards, annual standards are met if the annual average falls below the standard at every site. The national annual particulate standard for PM₁₀ is met if the three-year average falls below the standard at every site. The annual PM_{2.5} standard is met if the three-year average of annual averages spatially-averaged across officially-designed clusters of sites falls below the standard.

Table notes are continued on the following page.

- ^c National air quality standards are set by USEPA at levels determined to be protective of public health with an adequate margin of safety.
- ^d In June 2004, the Bay Area was designated as a marginal nonattainment area for the national 8-hour ozone standard. USEPA lowered the national 8-hour ozone standard from 0.80 to 0.75 PPM (i.e., 75 ppb), effective May 27, 2008.
- ^e The national 1-hour ozone standard was revoked by USEPA on June 15, 2005.
- ^f In April 1998, the Bay Area was redesignated to attainment for the national 8-hour carbon monoxide standard.
- ^g In June 2002, ARB established new annual standards for PM_{2.5} and PM₁₀.
- ^h The 8-hour California ozone standard was approved by the ARB on April 28, 2005 and became effective on May 17, 2006.
- ⁱ On January 9, 2013, USEPA issued a final rule to determine that the Bay Area attains the 24-hour PM_{2.5} national standard. This USEPA rule suspends key SIP requirement as long as monitoring data continues to show that the Bay Area attains the standard. Despite this USEPA action, the Bay Area will continue to be designated as nonattainment for the national 24-hour PM_{2.5} standard until such time as the Air District submits a redesignation request and a maintenance plan to USEPA and USEPA approves the proposed redesignation.
- ^j On June 2, 2010, the USEPA established a new 1-hour SO₂ standard, effective August 23, 2010, which is based on the three-year average of the annual 99th percentile of 1-hour daily maximum concentrations. The existing 0.030 ppm annual and 0.14 ppm 24-hour SO₂ NAAQS, however, must be used until one year following USEPA initial designations of the new 1-hour SO₂ NAAQS.

Lead (Pb) is not listed in the above table because it has been in attainment since the 1980s.

ppm = parts per million

mg/m³ = milligrams per cubic meter

µg/m³ = micrograms per cubic meter

Source: Bay Area Air Quality Management District, Bay Area Attainment Status, 2015.

Pollutant monitoring results for the years 2014 to 2016 at the Redwood City ambient air quality monitoring station, shown in Table IV.E-3, indicate that air quality in Redwood City has generally been good. As indicated in the monitoring results, one violation of the 8-hour State and federal ozone standard was recorded in 2015. The 1-hour O₃, CO, PM_{2.5}, and NO₂ standards were not exceeded at the Redwood City air quality ambient monitoring station during the three-year period. The Redwood City ambient air quality monitoring station did not monitor PM₁₀ or SO₂ during the three-year period, therefore, air quality data from the San Jose ambient air quality monitoring station was used. At the San Jose air quality monitoring station, the State PM₁₀ standard was exceeded once in 2014 and once in 2015. SO₂ standards were not exceeded in this area during the three-year period.

Table IV.E-3: Ambient Air Quality at the Redwood City Monitoring Station

| Pollutant | Standard | 2014 | 2015 | 2016 |
|--|----------------------------------|--------|--------|--------|
| Carbon Monoxide (CO) | | | | |
| Maximum 1-hour concentration (ppm) | | 3.2 | 3.4 | 2.2 |
| Number of days exceeded: | State: > 20 ppm | 0 | 0 | 0 |
| | Federal: > 35 ppm | 0 | 0 | 0 |
| Maximum 8-hour concentration (ppm) | | 1.6 | 1.6 | 1.1 |
| Number of days exceeded: | State: > 9 ppm | 0 | 0 | 0 |
| | Federal: > 9 ppm | 0 | 0 | 0 |
| Ozone (O₃) | | | | |
| Maximum 1-hour concentration (ppm) | | 0.086 | 0.086 | 0.075 |
| Number of days exceeded: | State: > 0.09 ppm | 0 | 0 | 0 |
| Maximum 8-hour concentration (ppm) | | 0.066 | 0.071 | 0.061 |
| Number of days exceeded: | State: > 0.07 ppm | 0 | 1 | 0 |
| | Federal: > 0.08 ppm | 0 | 1 | 0 |
| Coarse Particulates (PM₁₀)¹ | | | | |
| Maximum 24-hour concentration (µg/m ³) | | 56.4 | 58.8 | 41.0 |
| Number of days exceeded: | State: > 50 µg/m ³ | 1 | 1 | 0 |
| | Federal: > 150 µg/m ³ | 0 | 0 | 0 |
| Annual arithmetic average concentration (µg/m ³) | | 20.0 | 21.9 | 18.3 |
| Exceeded for the year: | State: > 20 µg/m ³ | No | Yes | No |
| | Federal: > 50 µg/m ³ | No | No | No |
| Fine Particulates (PM_{2.5}) | | | | |
| Maximum 24-hour concentration (µg/m ³) | | 35.0 | 34.6 | 19.5 |
| Number of days exceeded: | Federal: > 35 µg/m ³ | 0 | 0 | 0 |
| Annual arithmetic average concentration (µg/m ³) | | 7.2 | 6.0 | ND |
| Exceeded for the year: | State: > 12 µg/m ³ | No | No | No |
| | Federal: > 12 µg/m ³ | No | No | No |
| Nitrogen Dioxide (NO₂) | | | | |
| Maximum 1-hour concentration (ppm) | | 0.055 | 0.047 | 0.045 |
| Number of days exceeded: | State: > 0.250 ppm | 0 | 0 | 0 |
| Annual arithmetic average concentration (ppm) | | 0.011 | 0.010 | 0.009 |
| Exceeded for the year: | Federal: > 0.053 ppm | No | No | No |
| Sulfur Dioxide (SO₂)¹ | | | | |
| Maximum 1-hour concentration (ppm) | | 0.003 | 0.003 | 0.002 |
| Number of days exceeded: | State: > 0.25 ppm | 0 | 0 | 0 |
| Maximum 3-hour concentration (ppm) | | ND | ND | ND |
| Number of days exceeded: | Federal: > 0.50 ppm | ND | ND | ND |
| Maximum 24-hour concentration (ppm) | | 0.001 | 0.001 | 0.001 |
| Number of days exceeded: | State: > 0.04 ppm | 0 | 0 | 0 |
| | Federal: > 0.14 ppm | 0 | 0 | 0 |
| Annual arithmetic average concentration (ppm) | | 0.0002 | 0.0003 | 0.0002 |
| Exceeded for the year: | Federal: > 0.030 ppm | No | No | No |

¹ Data from the San Jose monitoring site.

ppm = parts per million

µg/m³ = micrograms per cubic meter

ND = No data. There was insufficient (or no) data to determine the value.

Source: USEPA, 2017.

c. Regulatory Framework. Air quality standards, the regulatory framework, and State and federal attainment status are discussed below.

The BAAQMD is primarily responsible for regulating air pollution emissions from stationary sources (e.g., factories) and indirect sources (e.g., traffic associated with new development), as well as for monitoring ambient pollutant concentrations. BAAQMD jurisdiction encompasses seven counties – Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa – and portions of Solano and Sonoma counties. The ARB and the USEPA regulate direct emissions from motor vehicles.

(1) United States Environmental Protection Agency. At the federal level, the USEPA has been charged with implementing national air quality programs. USEPA's air quality mandates are drawn primarily from the Federal Clean Air Act (FCAA), which was enacted in 1963. The FCAA was amended in 1970, 1977, and 1990.

The FCAA required USEPA to establish primary and secondary NAAQS and required each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP). The FCAA Amendments of 1990 added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. USEPA has responsibility to review all state SIPs to determine conformity with the mandates of the FCAA and determine if implementation will achieve air quality goals. If the USEPA determines a SIP to be inadequate, a Federal Implementation Plan (FIP) may be prepared for the nonattainment area, which imposes additional control measures. Failure to submit an approvable SIP or to implement the plan within the mandated timeframe may result in sanctions on transportation funding and stationary air pollution sources in the air basin.

The USEPA is also required to develop National Emission Standards for Hazardous Air Pollutants, which are defined as those which may reasonably be anticipated to result in increased deaths or serious illness and which are not already regulated. An independent science advisory board reviews the health and exposure analyses conducted by the USEPA on suspected hazardous pollutants prior to regulatory development.

(2) California Air Resources Board. The ARB is the agency responsible for the coordination and oversight of State and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA), adopted in 1988. The CCAA requires that all air districts in the State achieve and maintain the California Ambient Air Quality Standards (CAAQS) by the earliest practical date. The CCAA specifies that districts should focus on reducing the emissions from transportation and air-wide emission sources, and provides districts with the authority to regulate indirect sources.

ARB is also primarily responsible for developing and implementing air pollution control plans to achieve and maintain the NAAQS. ARB is primarily responsible for Statewide pollution sources and produces a major part of the SIP. Local air districts provide additional strategies for sources under their jurisdiction. ARB combines this data and submits the completed SIP to USEPA.

Other ARB duties include monitoring air quality (in conjunction with air monitoring networks maintained by air pollution control and air quality management districts), establishing CAAQS (which are more stringent than the NAAQS), determining and updating area designations and maps, and setting emissions standards for mobile sources, consumer products, small utility engines, and off-road vehicles. The ARB's Diesel Risk Reduction Plan is intended to substantially reduce diesel particulate matter emissions and associated health risks through introduction of ultra-low-sulfur diesel fuel – a step already implemented – and cleaner-burning diesel engines.

Because of the robust evidence relating proximity to roadways and a range of non-cancer and cancer health effects, the ARB also created guidance for avoiding air quality conflicts in land use planning in its Air Quality and Land Use Handbook: A Community Health Perspective. In its guidance, the ARB advises that new sensitive uses (e.g. residences, schools, day care centers, playgrounds, and hospitals) not be located within 500 feet of a freeway or urban roads carrying 100,000 vehicles per day, or within 1,000 feet of a distribution center (warehouse) that accommodates more than 100 trucks or more than 90 refrigerator trucks per day.

ARB guidance suggests that the use of these guidelines be customized for individual land use decisions, and take into account the context of development projects. The Air Quality and Land Use Handbook specifically states that these recommendations are advisory and acknowledges that land use agencies must balance other considerations, including housing and transportation needs, economic development priorities, and other quality of life issues.

(3) National and State Ambient Air Quality Standards. Pursuant to the FCAA of 1970, the USEPA established NAAQS. The NAAQS were established for major pollutants, termed “criteria” pollutants. Criteria pollutants are defined as those pollutants for which the federal and State governments have established ambient air quality standards, or criteria, for outdoor concentrations in order to protect public health.

Both the USEPA and the ARB have established ambient air quality standards for the following common pollutants: CO, O₃, NO₂, SO₂, Pb, and PM. In addition, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety. These ambient air quality standards are levels of contaminants that avoid specific adverse health effects associated with each pollutant.

Federal standards include both primary and secondary standards. Primary standards establish limits to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, and damage to animals, crops, vegetation, and buildings.¹⁰ State and federal standards for the criteria air pollutants are listed in Table IV.E-4.

¹⁰ U.S. Environmental Protection Agency, 2017. Website: www.epa.gov/criteria-air-pollutants (accessed November 2, 2017). October.

Table IV.E-4: Federal and State Ambient Air Quality Standards

| Pollutant | Averaging Time | California Standards ^a | | Federal Standards ^b | | | |
|---|---|--------------------------------------|--|---|--------------------------------|--|--------------------------------------|
| | | Concentration ^c | Method ^d | Primary ^{c,e} | Secondary ^{c,f} | Method ^g | |
| Ozone (O3)^h | 1-Hour | 0.09 ppm (180 µg/m ³) | Ultraviolet Photometry | – | Same as Primary Standard | Ultraviolet Photometry | |
| | 8-Hour | 0.07 ppm (137 µg/m ³) | | 0.070 ppm (137 µg/m ³) | | | |
| Respirable Particulate Matter (PM10)ⁱ | 24-Hour | 50 µg/m ³ | Gravimetric or Beta Attenuation | 150 µg/m ³ | Same as Primary Standard | Inertial Separation and Gravimetric Analysis | |
| | Annual Arithmetic Mean | 20 µg/m ³ | | – | | | |
| Fine Particulate Matter (PM2.5)ⁱ | 24-Hour | – | Gravimetric or Beta Attenuation | 35 µg/m ³ | Same as Primary Standard | Inertial Separation and Gravimetric Analysis | |
| | Annual Arithmetic Mean | 12 µg/m ³ | | 12.0 µg/m ³ | | | |
| Carbon Monoxide (CO) | 8-Hour | 9.0 ppm (10 mg/m ³) | Non-Dispersive Infrared Photometry (NDIR) | 9 ppm (10 mg/m ³) | – | Non-Dispersive Infrared Photometry (NDIR) | |
| | 1-Hour | 20 ppm (23 mg/m ³) | | 35 ppm (40 mg/m ³) | | | |
| | 8-Hour (Lake Tahoe) | 6 ppm (7 mg/m ³) | | – | | | |
| Nitrogen Dioxide (NO2)^j | Annual Arithmetic Mean | 0.03 ppm (57 µg/m ³) | Gas Phase Chemi- luminescence | 53 ppb (100 µg/m ³) | Same as Primary Standard | Gas Phase Chemi- luminescence | |
| | 1-Hour | 0.18 ppm (339 µg/m ³) | | 100 ppb (188 µg/m ³) | | | |
| Lead (Pb)^{l,m} | 30-Day Average | 1.5 µg/m ³ | Atomic Absorption | – | Same as Primary Standard | High-Volume Sampler and Atomic Absorption | |
| | Calendar Quarter | – | | 1.5 µg/m ³ (for certain areas) ¹ | | | |
| | Rolling 3- Month Average ⁱ | – | | 0.15 µg/m ³ | | | |
| Sulfur Dioxide (SO2)^k | 24-Hour | 0.04 ppm (105 µg/m ³) | Ultraviolet Fluorescence | 0.14 ppm (for certain areas) | – | Ultraviolet Fluorescence; Spectro- photometry (Pararosaniline Method) | |
| | 3-Hour | – | | – | | | 0.5 ppm (1300 µg/m ³) |
| | 1-Hour | 0.25 ppm (655 µg/m ³) | | 75 ppb (196 µg/m ³) ^k | | | – |
| | Annual Arithmetic Mean | – | | 0.030 ppm (for certain areas) ^k | | | – |
| Visibility- Reducing Particles¹ | 8-Hour | See footnote n | Beta Attenuation and Transmittance through Filter Tape. | Federal Standards | | | |
| Sulfates | 24-Hour | 25 µg/m ³ | Ion Chromatography | | | | |
| Hydrogen Sulfide | 1-Hour | 0.03 ppm (42 µg/m ³) | Ultraviolet Fluorescence | | | | |
| Vinyl Chloride^j | 24-Hour | 0.01 ppm (26 µg/m ³) | Gas Chromatography | | | | |

Table notes are provided on the following page.

- ^a California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1- and 24-hour), nitrogen dioxide, and particulate matter (PM₁₀, PM_{2.5}, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
- ^b National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM₁₀, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m³ is equal to or less than one. For PM_{2.5}, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact USEPA for further clarification and current national policies.
- ^c Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
- ^d Any equivalent measurement method which can be shown to the satisfaction of the CARB to give equivalent results at or near the level of the air quality standard may be used.
- ^e National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
- ^f National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
- ^g Reference method as described by the USEPA. An “equivalent method” of measurement may be used but must have a “consistent relationship to the reference method” and must be approved by the USEPA.
- ^h On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.
- ⁱ On December 14, 2012, the national annual PM_{2.5} primary standard was lowered from 15 µg/m³ to 12.0 µg/m³. The existing national 24-hour PM_{2.5} standards (primary and secondary) were retained at 35 µg/m³, as was the annual secondary standard of 15 µg/m³. The existing 24-hour PM₁₀ standards (primary and secondary) of 150 µg/m³ also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.
- ^j To attain the 1-hour national standard, the three-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.
- ^k On June 2, 2010, a new 1-hour SO₂ standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the three-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO₂ national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.
Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.
- ^l The ARB has identified lead and vinyl chloride as ‘toxic air contaminants’ with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
- ^m The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 µg/m³ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.
- ⁿ In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are “extinction of 0.23 per kilometer” and “extinction of 0.07 per kilometer” for the statewide and Lake Tahoe Air Basin standards, respectively.

°C = degrees Celsius

CARB = California Air Resources Board

USEPA = United States Environmental Protection Agency

ppb = parts per billion

ppm = parts per million

mg/m³ = milligrams per cubic meter

µg/m³ = micrograms per cubic meter

Source: California Air Resources Board, 2016. Ambient Air Quality Standards. Available online at: www.arb.ca.gov/research/aaqs/aaqs2.pdf (accessed November 2, 2017).

(4) Bay Area Air Quality Management District. The BAAQMD seeks to attain and maintain air quality conditions in the San Francisco Bay Area Air Basin through a comprehensive program of planning, regulation, enforcement, technical innovation, and education. The clean air strategy includes the preparation of plans for the attainment of ambient air quality standards, adoption

and enforcement of rules and regulations, and issuance of permits for stationary sources. The BAAQMD also inspects stationary sources and responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements programs and regulations required by law.

BAAQMD Regulation 7 places general limitations on odorous substances and specific emission limitations on certain odorous compounds.¹¹ This regulation limits the “discharge of any odorous substance which causes the ambient air at or beyond the property line...to be odorous and to remain odorous after dilution with four parts of odor-free air.” The BAAQMD must receive odor complaints from ten or more complainants within a 90-day period in order for the limitations of this regulation to go into effect. If this criterion has been met, an odor violation can be issued by the BAAQMD if a test panel of people can detect an odor in samples collected periodically from the source.

(5) Clean Air Plan. The Clean Air Plan guides the region’s air quality planning efforts to attain the CAAQS. The BAAQMD 2017 Clean Air Plan, which was adopted on April 19, 2017 by the BAAQMD Board of Directors, is the current Clean Air Plan which contains district-wide control measures to reduce ozone precursor emissions (i.e., ROG and NO_x), particulate matter and greenhouse gas emissions.

The Bay Area 2017 Clean Air Plan:

- Describes the BAAQMD plan towards attaining all State and federal air quality standards and eliminating health risk disparities from exposure to air pollution among bay area communities;
- Defines a vision for transitioning the region to a post-carbon economy needed to achieve ambitious greenhouse gas reduction targets for 2030 and 2050;
- Provides a regional climate protection strategy that will put the Bay area on a pathway to achieve greenhouse gas (GHG) reduction targets; and
- Includes a wide range of control measures designed to decrease emissions of air pollutants that are most harmful to Bay Area residents, such as particulate matter, ozone, and toxic air contaminants; to reduce emissions of methane and other “Super-GHGs” that are potent climate pollutants in the near term; and to decrease emissions of carbon dioxide by reducing fossil fuel combustion.

(6) BAAQMD CEQA Air Quality Guidelines. The BAAQMD California Environmental Quality Act (CEQA) Air Quality Guidelines were prepared to assist in the evaluation of air quality impacts of projects and plans proposed within the Bay Area. The guidelines provide recommended procedures for evaluating potential air impacts during the environmental review process, consistent with CEQA requirements, and include recommended thresholds of significance, mitigation measures, and background air quality information. They also include recommended assessment methodologies for air toxics, odors, and greenhouse gas emissions.

¹¹ Bay Area Air Quality Management District, 1982. *Rules and Regulations, Regulation 7: Odorous Substances*. March.

In June 2010, BAAQMD adopted updated draft CEQA Air Quality Guidelines and finalized them in May 2011. These guidelines superseded previously adopted agency air quality guidelines of 1999 and were intended to advise lead agencies on how to evaluate potential air quality impacts.

In May 2017, the BAAQMD published an updated version of the CEQA Guidelines. The 2017 CEQA Guidelines include thresholds to evaluate project impacts in order to protectively evaluate the potential effects of the project on air quality. These protective thresholds are appropriate in the context of the size, scale, and location of the project.

The California Building Industry Association (CBIA) subsequently filed suit against BAAQMD claiming the agency had failed to comply with CEQA when adopting the guidelines.¹² On March 5, 2012, the Alameda County Superior Court issued a judgment finding that the BAAQMD had failed to comply with CEQA when it adopted the thresholds of significance in the BAAQMD CEQA Air Quality Guidelines. The court did not determine whether the thresholds of significance were valid on their merits, but found that the adoption of the thresholds was a “project” under CEQA. The court issued a writ of mandate ordering the BAAQMD to set aside the thresholds and cease dissemination of them until the BAAQMD complied with CEQA. The BAAQMD has appealed the Alameda County Superior Court’s decision. The Court of Appeal of the State of California, First Appellate District, reversed the trial court's decision. The Court of Appeal's decision was appealed to the California Supreme Court, which filed a decision on December 17, 2015. The court concluded that CEQA does not require an analysis of how existing environmental conditions will impact a project’s future users or residents.

(7) City of Redwood City. The City of Redwood City addresses air quality in the General Plan Public Safety Element.¹³ Goals and policies in the Public Safety Element are designed to maintain good local air quality, and reduce the local contributions of airborne pollutants to the air basin, minimize the potential impacts from land uses that may pollute proximate to sensitive receptors, and reduce the volume of pollutants generated by motorized vehicles. The following policies are applicable to the proposed project:

- Policy PS-1.1: Work with neighboring jurisdictions and regional agencies—including the Association of Bay Area Governments (ABAG), the Bay Area Air Quality Management District (BAAQMD), and the Metropolitan Transportation Commission (MTC)—to reduce motor vehicle emissions.
- Policy PS-1.2: Minimize vehicle emissions by reducing automobile use and encouraging alternative means of transportation.
- Policy PS-1.3: Pursue efforts to reduce air pollution and greenhouse gas emissions by promoting the use of renewable energy (e.g., solar, wind, and hydroelectric power), and implement effective energy conservation and efficiency measures.
- Policy PS-1.4: Integrate air quality planning with land use, economic development, and transportation planning.

¹² California Supreme Court, 2015. *California Building Industry Association v. Bay Area Air Quality Management District* 62 Cal.4th 369, Case No. S213478. December.

¹³ Redwood City, City of. 2010. *Redwood City General Plan*. October 11.

- Policy PS-1.5: Require projects that generate potentially significant levels of air pollutants to incorporate the most effective air quality mitigation into project design, as feasible.
- Policy PS-2.1: Consider surrounding land uses when locating sensitive receptors such as schools, hospitals, and residential uses so they are not unreasonably exposed to uses that generate pollutants considered detrimental to human health.
- Policy PS-2.2: Prioritize opportunities for compact housing in Downtown and other areas buffered from designated through truck routes.
- Policy PS-2.3: Consider re-routing truck routes and high volumes of nonresidential traffic away from residential neighborhoods, particularly high-density residential neighborhoods.
- Policy PS-2.4: Avoid placing sensitive uses within 500 feet—or other distance deemed to be appropriate based on project-specific health risk assessment data—of the Port of Redwood City, related heavy industrial areas, and any roadways serving Port uses.
- Policy PS-2.5: Encourage the development and/or implementation of new technologies that address or mitigate pollutant emissions at the Port, transportation facilities, and industrial use locations.
- Policy PS-2.6: Require all land uses proposed within 500 feet of US 101, El Camino Real, and Woodside Road that will house, accommodate, or serve sensitive receptors to incorporate appropriate design and construction features (e.g., filters on HVAC systems) that reduce potential exposure of persons to pollutants.
- Policy PS-2.7: Discourage the establishment of any new school or housing for senior residents within 500 feet of a freeway.
- Policy PS-3.1: Support programs that increase ridesharing, reduce pollutants generated by vehicle use, and meet the transportation control measures recommended by BAAQMD in the most recent Clean Air Plan.
- Policy PS-3.2: Support programs that decrease vehicle emissions by increasing the number of housing units located near jobs and transit, and encouraging commuting via transit, walking, and bicycling; thereby decreasing vehicle miles traveled (VMT).
- Policy PS-3.3: Implement policies of the Built Environment Element that provide for compact, urban-style forms of development and complete streets and neighborhoods to reduce vehicle emissions by placing residents closer to jobs and services and providing alternative modes of transportation.
- Policy PS-3.4: Implement the policies of the Built Environment Element that promote transportation mode shifts away from private automobile travel.
- Policy PS-3.5: Work with local schools and school districts to encourage children to walk or bike to school.

2. Impacts and Mitigation Measures

This section provides an assessment of the potential adverse impacts related to air quality associated with the proposed project. It begins with the criteria of significance, which establish the thresholds for determining whether an impact is significant. The latter part of this section identifies potential impacts. Where potentially significant impacts are identified, mitigation measures are recommended.

a. Criteria of Significance. Implementation of the proposed project would have a significant impact on the environment related to air quality if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or State ambient air quality standard;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

As discussed previously, in *CBIA v. BAAQMD*, the California Supreme Court¹⁴ held that CEQA generally does not require analysis or mitigation of the impact of existing environmental conditions on a project, including a project's future users or residents. However, as with other laws and regulations enforced by other agencies that protect public health and safety, the City as the lead agency has authority other than CEQA to require measures to protect public health and safety. Therefore, this document includes for informational purposes an evaluation of the environment's impacts on the project consistent with the current version of the CEQA Checklist provided in Appendix G of the CEQA Guidelines. The evaluation includes an assessment of the project's potential to expose future sensitive receptors that would be located on the project site to substantial pollutant concentrations by individual exposure to the existing sources of toxic air contaminants in the project vicinity and if future sensitive receptors would be exposed to existing odors at the project site. This analysis of the impacts of the environment on the project is provided for informational purposes only.

b. Project Impacts. The following section discusses the potential air quality impacts associated with implementation of the proposed project. Potential impacts would be the same for the proposed project and the project variant. Therefore, impacts of the proposed project and the project variant are not differentiated in this section.

(1) Conflict with Current Air Quality Plans. The applicable air quality plan is the BAAQMD 2017 Clean Air Plan, which was adopted on April 19, 2017. The Clean Air Plan is a comprehensive plan to improve Bay Area air quality and protect public health. The Clean Air Plan defines a control strategy to reduce emissions and ambient concentrations of air pollutants; safeguard public health by reducing exposure to air pollutants that pose the greatest health risk, with an

¹⁴ California Supreme Court, 2015, *op. cit.*

emphasis on protecting the communities most heavily affected by air pollution; and reduce greenhouse gas emissions to protect the climate. Consistency with the Clean Air Plan can be determined if the project does the following: 1) supports the goals of the Clean Air Plan; 2) includes applicable control measures from the Clean Air Plan; and 3) would not disrupt or hinder implementation of any control measures from the Clean Air Plan.

Transportation and Mobile Source Control Measures. The BAAQMD identifies control measures as part of the Clean Air Plan to reduce ozone precursor emissions from stationary, area, mobile, and transportation sources. The Transportation Control Measures are designed to reduce emissions from motor vehicles by reducing vehicle trips and vehicle miles traveled (VMT) in addition to vehicle idling and traffic congestion. The proposed project would result in the construction of a residential development with 131 townhomes and a segment of the Bay Trail located within the Redwood Creek/Harbor Center area of the City, which is an approximately 99-acre area primarily developed with light industrial, office, marina-oriented, and institutional uses. Across US 101, land uses consist of commercial and retail uses and the Redwood Creek. Downtown Redwood City is located approximately 1 mile to the south. Therefore the proposed project would locate residents near existing commercial, employment, and recreational uses. The proposed project would provide pedestrian access throughout the site via internal walkways and sidewalks. In addition, the project would provide bicycle parking at three locations along the Bay Trail for project residents and public use. Two additional bicycle parking locations are located on the project site. Therefore, the project would support the ability to use alternative modes of transportation and would promote initiatives to reduce vehicle trips and vehicle miles traveled and would increase the use of alternate means of transportation. Therefore, this proposed project would not conflict with the identified Transportation and Mobile Source Control Measures of the Clean Air Plan.

Land Use and Local Impact Measures. The Clean Air Plan includes Land Use and Local Impacts Measures (LUMs) to achieve the following: promote mixed-use, compact development to reduce motor vehicle travel and emissions; and ensure that planned growth is focused in a way that protects people from exposure to air pollution from stationary and mobile sources of emissions. The LUMs identified by the BAAQMD are not specifically applicable to the proposed project as they relate to actions the BAAQMD will take to reduce impacts from goods movement and health risks in affected communities. However, as noted above, the proposed project would provide townhome units located within an area that is in close proximity to commercial, retail, employment, and recreational uses. The proposed project would not conflict with any of the LUMs of the Clean Air Plan.

Energy Measures. The Clean Air Plan also includes Energy and Climate Control Measures, which are designed to reduce ambient concentrations of criteria pollutants and reduce emissions of CO₂. Implementation of these measures is intended to promote energy conservation and efficiency in buildings throughout the community, promote renewable forms of energy production, reduce the “urban heat island” effect by increasing reflectivity of roofs and parking lots, and promote the planting of (low-VOC-emitting) trees to reduce biogenic emissions, lower air temperatures, provide shade, and absorb air pollutants. The measures include voluntary approaches to reduce the heat island effect by increasing shading in urban and suburban areas through the planting of trees. The proposed project would include paved areas that could result in a heating effect. However, the proposed project includes private open space for use by individual residents, common open space for project residents, and public open space. In addition, new landscaping, including grasses, plants, shrubs, and trees would be located throughout the new development. Approximately 262 new trees would be planted on the project site and along the Bay Trail, in addition to trees to be planted along the Blomquist

Street Extension right of way, as determined by the City Engineering and Transportation Division. In addition, a 30-foot minimum shoreline greenway would contain a segment of the Bay Trail and associated landscaping. The proposed project would comply with the County of San Mateo's Water Efficient Landscape Ordinance. In addition, as part of the project's compliance with the latest California Building Code standards, the project is expected to be relatively energy efficient and would incorporate green building measures in compliance with the latest CALGreen's standard building measures for residential buildings and Title 24 requirements. Therefore the project would not conflict with the Energy and Climate Control Measures. As discussed above, implementation of the proposed project would not disrupt or hinder implementation of the applicable measures outlined in the Clean Air Plan, including Transportation and Mobile Source Control Measures, Land Use and Local Impact Measures, and Energy Measures.

(2) Violate Air Quality Standards or Contribute Substantially to an Existing or Projected Air Quality Violation. According to the BAAQMD CEQA Guidelines, to meet air quality standards for operational-related criteria air pollutant and air precursor impacts, the project must not:

- Contribute to CO concentrations exceeding the State ambient air quality standards;
- Generate average daily construction emissions of ROG, NO_x or PM_{2.5} (exhaust) greater than 54 pounds per day or PM₁₀ exhaust emissions greater than 82 pounds per day; or
- Generate operational emissions of ROG, NO_x or PM_{2.5} of greater than 10 tons per year or 54 pounds per day or PM₁₀ emissions greater than 15 tons per year or 82 pounds per day.

The following section describes the project's CO impacts and construction- and operation-related air quality impacts. The discussion for localized CO impacts and operational emissions analyzes the impact of the proposed project. The conclusions are summarized at the end of each subsection. As discussed, impacts would be less than significant for localized CO and operational emissions. Impacts associated with construction-period emissions would be less than significant with implementation of recommended mitigation measures.

Construction Emissions. During construction, short-term degradation of air quality may occur due to the release of particulate matter emissions (i.e., fugitive dust) generated by excavation, grading, hauling, and other activities. Emissions from construction equipment are also anticipated and would include CO, NO_x, ROG, directly-emitted particulate matter (PM_{2.5} and PM₁₀), and TACs such as diesel exhaust particulate matter.

Site preparation and project construction would involve clearing, cut-and-fill activities, grading, and other similar activities. Construction-related effects on air quality from the proposed project would be greatest during the site preparation phase because most engine emissions are associated with the excavation, handling, and transport of soils on the site. If not properly controlled, these activities would temporarily generate PM₁₀, PM_{2.5}, and to a lesser extent CO, SO₂, NO_x, and volatile organic compounds. Sources of fugitive dust would include disturbed soils at the construction sites and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit dirt and mud on local streets, which could be an additional source of airborne dust after it dries. PM₁₀ emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM₁₀ emissions would depend on soil moisture, the silt content of soil, wind speed, and the amount of operating equipment. Larger dust particles would settle near the source,

while fine particles would be dispersed over greater distances from the construction site. These emissions would be temporary and limited to the immediate area surrounding the construction sites.

Impact AIR-1: Construction of the proposed project and the project variant would generate air pollutant emissions that could violate air quality standards. (S)

Water or other soil stabilizers can be used to control dust, resulting in emission reductions of 50 percent or more. The BAAQMD has established standard measures for reducing fugitive dust emissions (PM₁₀). With the implementation of these Basic Construction Mitigation Measures and Additional Construction Best Management Practices, fugitive dust emissions from construction activities would not result in adverse air quality impacts.

In addition to dust-related PM₁₀ emissions, heavy trucks and construction equipment powered by gasoline and diesel engines would generate CO, SO₂, NO_x, ROG and some soot particulate (PM_{2.5} and PM₁₀) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase slightly while those vehicles are delayed. These emissions would be temporary and limited to the immediate area surrounding the construction site.

Construction emissions were estimated for the project using the California Emissions Estimator Model version 2016.3.2 (CalEEMod), consistent with BAAQMD recommendations. The project would include the demolition of the existing on-site buildings and approximately 10,000 tons of demolition waste would be generated by the project. Including remediation, raising the base elevation, surcharge, and over-excavation activities, a total of approximately 14,350 cubic yards of soil would be excavated from the site and off-hauled and a total of 67,750 cubic yards of fill would be brought to balance the site. These activities were included as inputs to the CalEEMod analysis. For purposes of this CalEEMod analysis, construction of the project is anticipated to start in 2019 and would occur over a 33 month period. Demolition activities are anticipated to occur over an approximately 3 month period and grading would occur over a 12 month period. Exterior work such as foundation installation, building construction, and installation of pavements is expected to occur over an 18 month period. Project occupancy is expected to occur in late 2021. In addition, a construction fleet activities list provided by the project applicant was input into CalEEMod. Construction-related emissions are presented in Table IV.E-5. CalEEMod output sheets are included in Appendix D.

Table IV.E-5: Project Construction Emissions in Pounds Per Day

| Project Construction | ROG | NO_x | Exhaust PM₁₀ | Exhaust PM_{2.5} |
|-----------------------------|------------|-----------------------|--------------------------------|---------------------------------|
| Average Daily Emissions | 5.5 | 25.3 | 1.0 | 0.9 |
| BAAQMD Thresholds | 54 | 54 | 82 | 54 |
| Exceed Threshold? | No | No | No | No |

Source: LSA, October 2017.

As shown in Table IV.E-5, construction emissions associated with the project would be less than significant for ROG, NO_x and PM_{2.5} and PM₁₀ exhaust emissions. Mitigation measures to require implementation of the BAAQMD Basic Construction Mitigation Measures would reduce construction dust impacts to a less-than-significant level as follows:

Mitigation Measure AIR-1: Consistent with guidance from the BAAQMD, the project contractor shall ensure the following Basic Construction Mitigation Measures are implemented through all construction contracts and specifications for the project:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- All visible mud or dirt tracked-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.
- All vehicle speeds on unpaved roads shall be limited to 15 mph.
- 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.
- 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.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- A publicly visible sign shall be posted with the telephone number and person to contact at the City of Redwood City regarding dust complaints. This person shall respond and take corrective action within 48 hours. The BAAQMD phone number shall also be visible to ensure compliance with applicable regulations. (LTS)

Operational Emissions. Long-term air emission impacts are those associated with area sources and mobile sources involving any change related to the proposed project. In addition to the short-term construction emissions, the project would also generate long-term air emissions, such as those associated with changes in permanent use of the project site. These long-term emissions are primarily mobile source emissions that would result from vehicle trips associated with the proposed project. Area sources, such as natural gas heaters, landscape equipment, and use of consumer products, would also result in pollutant emissions.

PM₁₀ emissions result from running exhaust, tire and brake wear, and the entrainment of dust into the atmosphere from vehicles traveling on paved roadways. Entrainment of PM₁₀ occurs when vehicle tires pulverize small rocks and pavement and the vehicle wakes generate airborne dust. The contribution of tire and brake wear is small compared to the other PM emission processes. Gasoline-powered engines have small rates of particulate matter emissions compared with diesel-powered vehicles. Since much of the project traffic fleet would be made up of light-duty gasoline-powered vehicles, a majority of the PM₁₀ emissions would result from entrainment of roadway dust from vehicle travel.

Energy source emissions result from activities in buildings for which electricity and natural gas are used (non-hearth). The quantity of emissions is the product of usage intensity (i.e., the amount of electricity or natural gas) and the emission factor of the fuel source. Major sources of energy demand

include building mechanical systems, such as heating and air conditioning, lighting, and plug-in electronics, such as refrigerators or cooking equipment. Greater building or appliance efficiency reduces the amount of energy for a given activity and thus lowers the resultant emissions. The emission factor is determined by the fuel source, with cleaner energy sources, like renewable energy, producing fewer emissions than conventional sources. The proposed project would not include an emergency backup generator.

Area source emissions associated with the project would include emissions from water heating and the use of landscaping equipment.

Emission estimates for the project were calculated using CalEEMod. Model results are shown in Table IV.E-6. Based on the trip generation prepared by Fehr & Peers (refer to Section IV.D, Transportation and Circulation),¹⁵ the proposed project would typically generate 814 net new average daily trips, which was included as an input to the CalEEMod analysis.

Table IV.E-6: Project Operational Emissions

| | ROG | NO _x | PM ₁₀ | PM _{2.5} |
|------------------------------------|-------------|-----------------|------------------|-------------------|
| Emissions in Pounds Per Day | | | | |
| Area Source Emissions | 3.5 | 0.1 | 0.0 | 0.0 |
| Energy Source Emissions | 0.0 | 0.3 | 0.0 | 0.0 |
| Mobile Source Emissions | 1.2 | 5.8 | 3.9 | 1.1 |
| Total Emissions | 4.7 | 6.1 | 3.9 | 1.1 |
| BAAQMD Threshold | 54.0 | 54.0 | 82.0 | 54.0 |
| Exceed? | No | No | No | No |
| Emissions in Tons Per Year | | | | |
| Area Source Emissions | 0.6 | 0.0 | 0.0 | 0.0 |
| Energy Source Emissions | 0.0 | 0.1 | 0.0 | 0.0 |
| Mobile Source Emissions | 0.2 | 1.1 | 0.7 | 0.2 |
| Total Emissions | 0.9 | 1.1 | 0.7 | 0.2 |
| BAAQMD Threshold | 10.0 | 10.0 | 15.0 | 10.0 |
| Exceed? | No | No | No | No |

Source: LSA, October 2017.

The daily emissions associated with project operational trip generation, energy and area sources are identified in Table IV.E-6 for ROG, NO_x, PM₁₀, and PM_{2.5}. The primary emissions associated with the project are regional in nature, meaning that air pollutants are rapidly dispersed on release or, in the case of vehicle emissions associated with the project; emissions are released in other areas of the air basin. Because the resulting emissions are dispersed rapidly and contribute only a small fraction of the region's air pollution, air quality in the immediate vicinity of the project site would not substantially change compared to existing conditions or the air quality monitoring data reported in Table IV.E-3. Model results are shown in Appendix D.

¹⁵ Fehr and Peers, 2017. *1548 Maple Street: Trip Generation, Distribution, Assignment, and Cumulative Traffic Volumes*. June 23.

The results shown in Table IV.E-6 indicate the project would not exceed the significance criteria for daily ROG, NO₂, PM₁₀ or PM_{2.5} emissions; therefore, the proposed project would have a less-than-significant impact on regional air quality.

Localized CO Impacts. The BAAQMD has established a screening methodology that provides a conservative indication of whether the implementation of a proposed project would result in significant CO emissions. According to the BAAQMD CEQA Guidelines, a proposed project would result in a less-than-significant impact to localized CO concentrations if the following screening criteria are met:

- The project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, and the regional transportation plan and local congestion management agency plans.
- Project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour.
- The project 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, bridge underpass, natural or urban street canyon, or below-grade roadway).

Implementation of the proposed project would not conflict with the San Mateo Countywide Transportation Plan (CTP). The CTP is a countywide long-range transportation plan for the county. As noted, the proposed project would generate approximately 814 net new average trips per day, with 64 trips occurring during the AM peak hour and 75 trips occurring during the PM peak hour. Therefore, the proposed project would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour, or increase traffic volumes at affected intersections to more than 24,000 vehicles per hour. Therefore, the project would not result in localized CO concentrations that exceed State or federal standards and this impact would be less than significant.

(3) Exposure of Sensitive Receptors to Toxic Air Contaminants. A project would result in a significant impact related to TAC exposure if it would: individually expose sensitive receptors to TACs resulting in an increased cancer risk greater than 10.0 in one million, increased non-cancer risk of greater than 1.0 on the hazard index (chronic or acute), or an annual average ambient PM_{2.5} increase greater than 0.3 µg/m³. A significant cumulative impact would occur if the project, in combination with other projects located within a 1,000-foot radius of the project site, would expose sensitive receptors to TACs resulting in an increased cancer risk greater than 100.0 in one million, an increased non-cancer risk of greater than 10.0 on the hazard index (chronic), or an ambient PM_{2.5} increase greater than 0.8 µg/m³ on an annual average basis.

The project site is located in an urban area near existing residential and commercial uses that could be exposed to diesel emission exhaust during the construction period. However, by implementing BAAQMD basic construction emission control measures (Mitigation Measure AIR-1), the nearby sensitive receptors would not be exposed to substantial construction-related pollutant concentrations. Once the project is constructed, the project would not be a source of substantial emissions. Therefore, construction health risk impacts would be considered less than significant.

The following section describes the potential impacts on sensitive receptors from operation of the proposed project.

Impact AIR-2: Operation of the proposed project would expose future residents of the project site to toxic air contaminants. (S)

Consistent with General Plan Policy PS-2.6, which requires all land uses proposed within 500 feet of US 101, an analysis of potential health risk and mitigation strategies was performed. To determine health risks associated with the project to on-site receptors, a health risk assessment (HRA) was conducted for the proposed project based on three current guidance documents: 1) the California EPA Air Toxics Hot Spots Program Risk Assessment Guidelines,¹⁶ 2) The California Air Pollution Control Officers Association (CAPCOA) Health Risk Assessment for Proposed Land Use Projects,¹⁷ and 3) the BAAQMD Recommended Methods for Screening and Modeling Local Risks and Hazards.¹⁸ The BAAQMD document was released in May 2012 with the purpose of assisting lead agencies in conducting a risk and hazard analysis as part of the environmental review process for proposed land use projects, and it provides Bay Area-specific guidance on how to screen projects and provides specific inputs for HRA modeling.

Mobile Sources. High volume roadways in the project vicinity could expose future residents on the project site to TACs. The project site is located approximately 20 feet east of US 101. The HRA was conducted using several steps: determine the PM₁₀ emission factor; determine source emission rates; determine concentrations at the project site; translate the PM₁₀ concentrations into health risk values; and compare the health risk values to BAAQMD thresholds to determine significance.

The BAAQMD requires that age sensitivity be included when assessing long term exposure or a 30-year lifetime cancer risk to sensitive receptors. The exposure assumptions are very conservative in that they assume an individual would reside at this location from birth through 30 years.

With the recent approval of the new OEHHA guidance,¹⁹ additional adjustments are recommended to account for the amount of time a person spends away from their home during his or her lifetime. Following the new OEHHA guidance document recommendations, a time away from home (TAFH) factor of 76.7 percent was applied to more accurately represent the exposure a person would have over a lifetime when they are at home.

¹⁶ California Environmental Protection Agency, 2003. *Air Toxics Hot Spots Program Risk Assessment Guidelines*. August.

¹⁷ California Air Pollution Control Officers Association, 2009. *Health Risk Assessment for Proposed Land Use Projects*. July.

¹⁸ Bay Area Air Quality Management District, 2016. *Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines*. Available online at: www.baaqmd.gov/~/_media/files/planning-and-research/rules-and-regs/workshops/2016/reg-2-5/hra-guidelines_clean_jan_2016-pdf.pdf?la=en (accessed November 2, 2017). January.

¹⁹ California Office of Environmental Health Hazard Assessment, 2015. *Risk Assessment Guidelines. A Guidance Manual for the Preparation of Health Risk Assessments*. February.

Annual traffic data obtained from Caltrans was used as an input to the model. According to Caltrans, the total annual average daily traffic (AADT) along US 101 near the project site is 221,000.²⁰ Emission factors for vehicle emissions were determined using the EMFAC 2014 On-Road Emission Factor Estimator. EMFAC 2014 includes assumptions of technological and regulatory changes that will reduce emission rates over time. However, this HRA only allows for a single emission rate for the entire 30-year health risk evaluation period. The average of diesel vehicle weighted emission rates for the 30-year period (2017 to 2046) is 0.015 gram diesel particulate matter per vehicle mile traveled (g dpm/VMT), which is almost identical to the year 2023 diesel vehicle weighted average emission rates. Therefore, a set of emissions factors from the year 2023 was used to represent the long-term 30-year evaluation period.

The classification of the total AADT into 13 vehicle type categories and the corresponding total emissions for that volume of vehicles at the average speed (5-90 miles per hour) were used in the analysis as shown in Appendix B. For the purpose of this assessment, it is assumed that the traffic volumes are constant throughout the year. The DPM emission rates used in the analysis were determined based on the vehicle distribution by type according to the Caltrans traffic data for US 101.²¹

Analysis Methodology. The dispersion modeling analysis was performed using AERMOD (American Meteorological Society/EPA Regulatory Model, Version 16216) to compute plume dispersion characteristics. AERMOD is a steady-state Gaussian air dispersion model that can be used to calculate pollutant concentrations from a wide variety of sources associated with an industrial complex out to a distance of 50 km. The AERMOD model allows the selection of a number of options that affect model output. The regulatory default AERMOD model options were selected for this analysis.

A 5-year meteorological dataset (2009 – 2013) was downloaded from ARB's website²² for air dispersion modeling. The meteorological dataset includes surface meteorological data recorded at the nearby San Carlos Airport monitoring station and upper air data recorded at Oakland International Airport.

The sources were modeled to approximately 0.5 mile north and south of the proposed project site, as shown in Appendix B. For purposes of this analysis, diesel vehicle exhaust was modeled based on an 8-lane highway with two sets of 83-volume sources, representing northbound and southbound traffic along US 101, respectively. Exhaust emissions for diesel cars and trucks were modeled separately as line volume sources, with a release height of 1.3 meters and a vertical (sigma z) of 1.2 meters for cars, and a release height of 3.4 meters and a vertical (sigma z) of 3.2 meters for trucks.²³ Modeled

²⁰ California Department of Transportation, 2015. Traffic Census Program, 2015 All Traffic Volumes on California State Highways. Website: www.dot.ca.gov/trafficops/census (accessed November 2, 2017)

²¹ Ibid.

²² California Air Resource Board, 2015. Meteorological Files. Website: www.arb.ca.gov/toxics/harp/metfiles2.htm (accessed November 2, 2017)

²³ U.S. Environmental Protection Agency, 2013. EPA Training Course, "Project Level Training for Quantitative-PM Hot-Spot Analyses, Using AERMOD for PM Hot-Spot Analyses." Website: www.epa.gov/state-and-local-transportation/project-level-training-quantitative-pm-hot-spot-analyses (accessed November 2, 2017).

receptors were placed in a grid representing the proposed residential building at the project site. Appendix D shows a representation of the modeled grid.

Appendix D also includes the model input and output sheets including the model results as well as portions of the AERMOD output file showing all model inputs and specific model outputs. The HRA modeling was conducted using ARB’s Hotspots Analysis Reporting Program (HARP2, Air Dispersion & Risk Tool Version dated 17052).

The HRA was conducted following the BAAQMD Health Risk Assessment Guidelines.²⁴ These guidelines are used by the BAAQMD to evaluate the health impacts from new and existing sources of toxic air contaminants. Listed below are the risk assessment assumptions that were used in the modeling.

- The residential cancer risk estimates are based on 30-year exposures (consistent with OEHHA guidance).
- Deposition velocity of 0.02 m/sec to calculate the rate toxic air contaminants in particulate form deposit on the soil, which may be ingested in soil or home-grown produce.
- Pathways considered for residential exposure included inhalation, soil ingestion, dermal absorption, homegrown produce, and mother’s milk.
- A “mixed” climate was assumed for the dermal exposure pathway.

Analysis Results. The results of the health risk analysis from US 101 traffic emission sources are shown in Table IV.E-7. Results indicate that vehicle exhaust concentrations on the project site would exceed the individual source significance thresholds established by the BAAQMD.

Table IV.E-7: Maximum Long-Term Health Risk Impacts from US 101 Mobile Sources to the Project Site

| Risk | Carcinogenic Inhalation Health Risk | Chronic Inhalation Hazard Index | Acute Inhalation Hazard Index | PM _{2.5} |
|--------------------------------|-------------------------------------|---------------------------------|-------------------------------|-------------------|
| Without Mitigation | | | | |
| 30-Year Residential Exposure | 22.2 | 0.010 | 0.0 | 0.20 |
| Single Source Threshold | 10 in a million | 1.0 | 1.0 | 0.3 |
| Exceed? (yes/no) | Yes | No | No | No |
| With Mitigation | | | | |
| 30-Year Residential Exposure | 4.4 | 0.002 | 0.0 | 0.04 |
| Single Source Threshold | 10 in a million | 1.0 | 1.0 | 0.3 |
| Exceed? (yes/no) | No | No | No | No |

Source: LSA, October 2017.

Results of the analysis indicate that the maximum single source “maximum exposed individual” (MEI) inhalation cancer risk, associated with living at the proposed development for 30 years would be 22.2 in 1 million, which would exceed the BAAQMD threshold of 10 in 1 million. The maximum

²⁴ Ibid.

chronic Hazard Index would be 0.01, which would be below the BAAQMD significance threshold of 1.0. The acute inhalation Hazard Index standard for non-carcinogenic contaminants is 1.0. As shown in Table IV.E-7, for future residents of the project site, the maximum acute Hazard Index from diesel exhaust would be below the threshold of 1.0.

As indicated in Table IV.E-7, mitigation would be required to reduce potential health risks associated with traffic on nearby US 101 to a less-than-significant level. Therefore, the following mitigation measure shall be implemented by the project applicant.

Mitigation Measure AIR-2: The following measures shall be implemented by the project applicant and approved by the City through the final design process to reduce TACs and particulate matter indoors to a level sufficient to achieve compliance with BAAQMD health risk thresholds:

- The project applicant shall provide an HVAC system with a control efficiency sufficient to result in a reduction of a minimum 80.0 percent of particulates of 2.5 microns or less, such as Minimum Efficiency Reporting Value (MERV)-13 filters or greater, for indoor air filtration systems²⁵. The ventilation system shall be certified to achieve the stated performance effectiveness from indoor areas.
- The project applicant shall locate all air intakes as far away from US 101 as feasible.
- The project applicant shall disclose to potential occupants of the project that the proximity of the project site to the freeway could result in increased long-term health risks. The disclosure shall indicate the specifications for the installed air filtration system. (LTS)

Implementation of Mitigation Measure AIR-2 would reduce the health risk impacts to a less-than-significant level. As shown in Table IV.E-7, with implementation of Mitigation Measure AIR-2, the highest cancer risk would be 4.4 in one million for the MEI, which is below the BAAQMD cancer risk threshold of 10 in one million. The Chronic Hazard Index would be 0.002, which is below the threshold of 1.0 and the acute Hazard Index would be below the threshold of 1.0. The results of the analysis also indicate that the maximum PM_{2.5} concentration would be 0.04 µg/m³, which is also below the BAAQMD significance threshold of 0.3 µg/m³. Therefore, with implementation of Mitigation Measure AIR-2, traffic on US 101 would not expose future residents of the project site to health risk levels that would exceed the criteria established by the BAAQMD. With mitigation, implementation of the project would not expose sensitive receptors to substantial pollutant concentrations.

Stationary Sources. The BAAQMD issues permits to businesses whose operation includes the release of TACs. These operations are known as stationary air pollution sources and should be considered for their exposure when locating sensitive receptors in a new location. The stationary source analysis evaluated 70-year exposure risk levels from permitted sources in the project vicinity, using the toxic air contaminant emissions reported to the BAAQMD by the stationary sources identified in the project vicinity. In order to identify stationary sources for a particular location, the BAAQMD provides KML (Google Earth) files for each county within the BAAQMD jurisdiction.

²⁵ California Air Resources Board, 2014. *Air Cleaning Devices for the Home, Frequently Asked Questions*. Available online at: www.arb.ca.gov/research/indoor/acdsumm.pdf (accessed November 2, 2017.)

Using the KML file for San Mateo County, the BAAQMD identified nine sources of emissions that were within 1,000 feet of the project site, one of which is a gas station and seven of which are generators. The results of the stationary source analysis are presented in Table IV.E-8. Following BAAQMD guidance, the stationary sources were scaled for distance using the BAAQMD Gasoline Dispensing Facility (GDF) Distance Multiplier Tool and Diesel Internal Combustion (IC) Engine Distance Multiplier Tool, both of which are shown in Appendix D of this EIR.

Table IV.E-8: Unmitigated Stationary TAC Sources Within 1,000 Feet of the Project Site

| Facility ID | Plant ID | Stationary Source (address & name) | Distance (feet) | Adjusted Risk (in one million) | PM _{2.5} Concentration (µg/m ³) | Hazard Index |
|------------------------------------|----------|---|-----------------|--------------------------------|--|--------------|
| 1106 | 14036 | South Bayside System Authority; 1581 Maple Street (generator) | <82 | 11.7 | 0.021 | 0.005 |
| 435 | 14879 | County of San Mateo; 1580 Maple Street (generator) | <82 | 1.9 | 0.001 | 0.001 |
| 445 | 14874 | County of San Mateo; 1590 Maple Street (generator) | <82 | 31.3 | 0.008 | 0.013 |
| 1117 | 15096 | Spray Craft Finishing; 629 Bair Island Road #220 | 900 | 0.00 | 0.000 | 0.001 |
| 966 | G11071 | Redwood City Police; 1301 Maple Street | 330 | 0.6 | n/a | 0.001 |
| 342 | 17468 | City of Redwood City; 1301 Maple Street (generator) | 330 | 12.3 | 0.003 | 0.020 |
| 596 | 17587 | Toys R Us; 202 Walnut Street (generator) | 540 | 0.00 | 0.000 | 0.000 |
| 710 | 20170 | Kohl's; 250 Walnut Street (generator) | 510 | 0.7 | 0.000 | 0.006 |
| 1026 | 17640 | San Mateo Credit Union; 350 Convention Way (generator) | 855 | 7.5 | 0.002 | 0.003 |
| Maximum Single Source Risks | | | | 31.3 | 0.021 | 0.020 |
| Single Source Threshold | | | | 10 in 1 million | 0.3 | 1.0 |
| Exceed? (yes/no) | | | | Yes | No | No |

Source: LSA, October 2017 and BAAQMD, 2017.

Results of the stationary source analysis indicate that sources in the project vicinity would exceed the stationary source threshold for risk and hazard. However, as shown in Table IV.E-9 below, implementation of Mitigation Measure AIR-2 would reduce carcinogenic health risk levels for future residents at the proposed project site to a maximum of 6.3 in one million, which would be below BAAQMD significance criteria.

Table IV.E-9: Mitigated Stationary TAC Sources Within 1,000 Feet of the Project Site

| Facility ID | Plant ID | Stationary Source (address & name) | Distance (feet) | Mitigated and Adjusted Risk (in one million) | PM _{2.5} Concentration (ug/m ³) | Hazard Index |
|------------------------------------|----------|---|-----------------|--|--|--------------|
| 1106 | 14036 | South Bayside System Authority; 1581 Maple Street (generator) | <82 | 2.4 | 0.001 | 0.004 |
| 435 | 14879 | County of San Mateo; 1580 Maple Street (generator) | <82 | 0.4 | 0.000 | 0.000 |
| 445 | 14874 | County of San Mateo; 1590 Maple Street (generator) | <82 | 6.3 | 0.003 | 0.002 |
| 1117 | 15096 | Spray Craft Finishing; 629 Bair Island Road #220 | 900 | 0.0 | 0.000 | 0.000 |
| 966 | G11071 | Redwood City Police; 1301 Maple Street | 330 | 0.1 | 0.000 | n/a |
| 342 | 17468 | City of Redwood City; 1301 Maple Street (generator) | 330 | 2.5 | 0.004 | 0.001 |
| 596 | 17587 | Toys R Us; 202 Walnut Street (generator) | 540 | 0.0 | 0.000 | 0.000 |
| 710 | 20170 | Kohl's; 250 Walnut Street (generator) | 510 | 0.1 | 0.001 | 0.000 |
| 1026 | 17640 | San Mateo Credit Union; 350 Convention Way (generator) | 855 | 1.5 | 0.001 | 0.000 |
| Maximum Single Source Risks | | | | 6.3 | 0.004 | 0.004 |
| Single Source Threshold | | | | 10 in 1 million | 0.3 | 1.0 |
| Exceed? (yes/no) | | | | No | No | No |

Source: LSA, October 2017 and BAAQMD, 2017.

As shown in Table IV.E-9, implementation of Mitigation Measure AIR-2 would reduce the carcinogenic health risk impacts associated with stationary sources to a less-than-significant level. As shown in Table IV.E-9, with implementation of Mitigation Measures AIR-2, the highest risk would be 6.3 in one million for the MEI, which is below the BAAQMD cancer risk threshold of 10 in one million. The Hazard Index would be 0.004, which is below the threshold of 1.0. The results of the analysis also indicate that the maximum PM_{2.5} concentration would be 0.004 µg/m³, which is also below the BAAQMD significance threshold of 0.3 µg/m³. Therefore, with implementation of Mitigation Measure AIR-2, stationary sources would not expose future residents of the project site to health risk levels that would exceed the criteria established by the BAAQMD.

Cumulative Analysis. The cumulative analysis sums all sources of emissions in the vicinity of the project site including stationary source and mobile sources. The cumulative cancer risk, hazard index, acute index and PM_{2.5} concentrations are shown in Table IV.E-10. Results of the cumulative analysis indicate the proposed project would not exceed BAAQMD cumulative thresholds and would not expose future residents of the project site to significant cumulative health risks.

Table IV.E-10: Cumulative Risk from All Sources

| Risk | Carcinogenic Inhalation Health Risk | Chronic Inhalation Hazard Index | Acute Inhalation Hazard Index | PM _{2.5} |
|-----------------------------|-------------------------------------|---------------------------------|-------------------------------|-------------------|
| Without Mitigation | | | | |
| Traffic on US 101 | 22.0 | 0.01 | 0.00 | 0.2 |
| Stationary Sources | 31.3 | 0.05 | 0.05 | 0.3 |
| Unmitigated Total | 53.3 | 0.06 | 0.05 | 0.5 |
| Cumulative Threshold | 100 in a million | 10.0 | 10.0 | 0.8 |
| Exceed? (yes/no) | No | No | No | No |
| With Mitigation | | | | |
| Traffic on US 101 | 4.4 | 0.002 | 0.00 | 0.04 |
| Stationary Sources | 6.3 | 0.004 | 0.004 | 0.00 |
| Mitigated Total | 10.7 | 0.006 | 0.004 | 0.05 |
| Cumulative Threshold | 100.0 | 10.0 | 10.0 | 0.8 |
| Exceed? (yes/no) | No | No | No | No |

Source: LSA, October 2017.

As discussed above, with implementation of Mitigation Measure AIR-2, exposure to roadway emissions, diesel particulate matter, and stationary source emissions at the proposed residential units on the project site would not result in a maximum exposure of future residents to a risk level that would exceed the criterion of significance for cancer health risk at the individual or cumulative level. The project is located approximately 20 feet from US 101. Based on data collected by Caltrans; this section of Highway I-101 has 4.5 percent truck traffic. The high percentage of truck traffic increases the resulting carcinogenic inhalation health risk. However, as shown in Appendix B, the cancer risk levels drop significantly from the southwestern edge of the property to a much lower risk level on the northeast side of the property further away from US 101.

The HRA results estimate that with mitigation, the project would not expose future residents to substantial pollutant concentrations that would cause harmful effects.

Therefore, with implementation of Mitigation Measure AIR-2, future residents of the project site would not be exposed to a substantial increase in health risk impacts from stationary sources of toxic air contaminants in the project vicinity.

(4) Odors. During construction, the various diesel powered vehicles and equipment in use on-site would create localized odors. These odors would be temporary and are not likely to be noticeable for extended periods of time beyond the project site. The potential for diesel odor impacts is therefore considered less than significant. In addition, the proposed uses that would be developed within the project site are not expected to produce any offensive odors that would result in frequent odor complaints and impacts would therefore be less than significant.

For informational purposes, a public records request to the BAAQMD, which included potential complaints from nearby off-site residents, revealed two odor complaints within 1,000 feet of the project site between 2014 and 2017. Both odor complaints were associated with Granite Rock Company at 365 Blomquist Street, approximately 465 feet east of the project site. Both odor

complaints were listed as unconfirmed. In addition, eight unconfirmed odor complaints were received without a specified location in the City. These odors could be detected at the project site; however, since there are no confirmed odor complaints recorded at the project site, project residents would not likely be subject to objectionable odors.

c. Cumulative Impacts. According to the BAAQMD, regional air pollution is largely a cumulative impact. No single project is sufficient in size to independently create regional nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. Therefore, if the proposed project's daily average or annual emissions of construction- or operational-related criteria air pollutants exceed any applicable threshold established by the BAAQMD, the proposed project would result in a considerable contribution to a cumulatively significant impact. As shown in Table IV.E-6, implementation of the proposed project would not generate significant operational emissions. As shown in the project-specific air quality impacts discussion above, the proposed project would not result in individually significant impacts and therefore the project would not result in a cumulatively considerable contribution to regional air quality impacts.

F. NOISE

This section describes existing noise and vibration conditions within the project area, sets forth criteria for determining the significance of noise and vibration impacts and estimates the likely noise and vibration impacts that would result from construction and operation of the proposed project. Potential impacts associated with implementation of proposed project and the project variant are described where those impacts might differ, and mitigation measures are identified, where required. Impacts related to the proximity of public and private airports are evaluated in the Initial Study prepared for the proposed project (see Appendix B) and these impacts were determined to be less than significant.

1. Setting

The setting section begins with an introduction to several key concepts and terms that are used in evaluating noise. This section also includes a description of current noise sources that affect the project site and the noise conditions that are experienced in the project site vicinity.

a. Characteristics of Sound. Noise is usually defined as unwanted sound and consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, or sleep. To the human ear, sound has two significant characteristics: pitch and loudness. Pitch is generally an annoyance, while loudness can affect our ability to hear. Pitch is the number of complete vibrations, or cycles per second, of a wave resulting in the tone's range from high to low. Loudness is the strength of a sound that describes a noisy or quiet environment and is measured by the amplitude of the sound wave. Loudness is determined by the intensity of the sound waves, combined with the reception characteristics of the human ear. Sound intensity refers to how hard the sound wave strikes an object, which in turn produces the sound's effect. This characteristic of sound can be measured precisely with instruments. The analysis of a project defines the noise environment of the project area in terms of sound intensity and its effects on adjacent sensitive land uses (e.g., residences, nursing homes, schools).

(1) Measurement of Sound. Sound intensity is measured through the A-weighted scale to correct for the relative frequency response of the human ear. That is, an A-weighted noise level de-emphasizes low and very high frequencies of sound similar to the human ear's de-emphasis of these frequencies. Unlike linear units (e.g., inches or pounds), decibels are measured on a logarithmic scale representing points on a sharply rising curve.

For example, 10 decibels (dB) are 10 times more intense than 1 dB; 20 dB are 100 times more intense than 1 dB; and 30 dB are 1,000 times more intense than 1 dB. Thirty decibels (30 dB) represent 1,000 times as much acoustic energy as 1 dB. The decibel scale increases as the square of the change, representing the sound pressure energy. A sound as soft as human breathing is about 10 times greater than 0 dB. The decibel system of measuring sound gives a rough connection between the physical intensity of sound and its perceived loudness to the human ear. A 10 dB increase in sound level is perceived by the human ear as only a doubling of the loudness of the sound. Ambient sounds generally range from 30 A-weighted decibels (dBA) (very quiet) to 100 dBA (very loud).

Sound levels are generated from a source, and their decibel level decreases as the distance from that source increases. Sound dissipates exponentially with distance from the noise source. For a single point source, sound levels decrease approximately 6 dBA for each doubling of distance from the source. This drop-off rate is appropriate for noise generated by stationary equipment. If noise is

produced by a line source (e.g., highway traffic or railroad operations), the sound decreases 3 dBA for each doubling of distance in a hard-site environment, and the sound decreases 4.5 dBA for each doubling of distance in a relatively flat environment with absorptive vegetation.

There are many ways to rate noise for various time periods, an appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound. Equivalent continuous sound level (L_{eq}) is the total sound energy of time varying noise over a sample period. However, the predominant rating scales for communities in the State of California are the L_{eq} and Community Noise Equivalent Level (CNEL) or the day-night average level (L_{dn}) based on dBA. CNEL is the time varying noise over a 24-hour period, with a 5 dBA weighting factor applied to the hourly L_{eq} for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as evening hours) and a 10 dBA weighting factor applied to noise occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale, but without the adjustment for events occurring during the evening hours. CNEL and L_{dn} are within 1 dBA of each other and are normally interchangeable.

Other noise rating scales that are important when assessing the annoyance factor include the maximum noise level (L_{max}), which is the highest exponential time averaged sound level that occurs during a stated time period. The noise environments discussed in this analysis for short-term noise impacts are specified in terms of maximum levels denoted by L_{max} , which reflects peak operating conditions and addresses the annoying aspects of intermittent noise. It is often used together with another noise scale, or noise standards in terms of percentile noise levels, in noise ordinances for enforcement purposes. For example, the L_{10} noise level represents the noise level exceeded 10 percent of the time during a stated period. The L_{50} noise level represents the median noise level. Half of the time the noise level exceeds this level, and half of the time it is less than this level. The L_{90} noise level represents the noise level exceeded 90 percent of the time and is considered the background noise level during a monitoring period. For a relatively constant noise source, the L_{eq} and L_{50} are approximately the same.

Noise impacts can be described in three categories. The first category includes audible impacts that refer to increases in noise levels noticeable to humans. Audible increases in noise levels generally refer to a change of 3.0 dB or greater since this level has been found to be the lowest audible change perceptible to humans in outdoor environments. The second category, potentially audible, refers to a change in the noise level between 1.0 and 3.0 dB, which is only noticeable in laboratory environments. The last category includes changes in noise levels of less than 1.0 dB, which are inaudible to the human ear. Only audible changes in existing ambient or background noise levels are considered potentially significant.

(2) Physiological Effects of Noise. Physical damage to human hearing begins at prolonged exposure (typically more than 8 hours, as defined by the Occupational Safety and Health Administration [OSHA]) to noise levels higher than 85 dBA. Exposure to high noise levels affects our entire system, with prolonged noise exposure in excess of 75 dBA increasing body tensions (thereby, affecting blood pressure and functions of the heart and the nervous system). In comparison, extended periods of noise exposure above 90 dBA would result in permanent cell damage. When the noise level reaches 120 dB, a tickling sensation occurs in the human ear, even with short-term exposure. This level of noise is called the threshold of feeling. As the sound reaches 140 dB, the tickling sensation is replaced by the feeling of pain in the ear. This is called the threshold of pain. A sound level of 160 to 165 dB will result in dizziness or loss of equilibrium. The ambient or background

noise problem is widespread and generally more concentrated in urban areas than in outlying less developed areas.

Table IV.F -1 lists “Definitions of Acoustical Terms,” and Table IV.F-2 displays “Common Sound Levels and Their Noise Sources.”

Table IV.F-1: Definitions of Acoustical Terms

| Term | Definitions |
|---|---|
| Decibel, dB | A unit of level that denotes the ratio between two quantities proportional to power; the number of decibels is 10 times the logarithm (to the base 10) of this ratio. |
| Frequency, Hz | Of a function periodic in time, the number of times that the quantity repeats itself in one second (i.e., number of cycles per second). |
| A-Weighted Sound Level, dBA | The sound level obtained by use of A-weighting. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted, unless reported otherwise. |
| L_{01} , L_{10} , L_{50} , L_{90} | The fast A-weighted noise levels equaled or exceeded by a fluctuating sound level for 1 percent, 10 percent, 50 percent, and 90 percent of a stated time period. |
| Equivalent Continuous Noise Level, L_{eq} | The level of a steady sound that, in a stated time period and at a stated location, has the same A-weighted sound energy as the time varying sound. |
| Community Noise Equivalent Level, CNEL | The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 5 dB to sound levels occurring in the evening from 7:00 p.m. to 10:00 p.m. and after the addition of 10 dB to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m. |
| Day/Night Noise Level, L_{dn} | The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 10 dB to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m. |
| L_{max} , L_{min} | The maximum and minimum A-weighted sound levels measured on a sound level meter, during a designated time interval, using fast time averaging. |
| Ambient Noise Level | The all-encompassing noise associated with a given environment at a specified time, usually a composite of sound from many sources at many directions, near and far; no particular sound is dominant. |
| Intrusive | The noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content, as well as the prevailing ambient noise level. |

Source: Harris, Cyril M., *Handbook of Acoustical Measurements and Noise Control*, 1991.

b. Characteristics of Groundborne Vibration. Vibrating objects in contact with the ground radiate vibration waves through various soil and rock strata to the foundations of nearby buildings. As the vibration propagates from the foundation throughout the remainder of the building, the vibration of floors and walls may be perceptible from the rattling of windows or a rumbling noise. The rumbling sound caused by the vibration of room surfaces is called groundborne noise. When

assessing annoyance from groundborne noise, vibration is typically expressed as root mean square (rms) velocity in units of decibels of 1 micro-inch per second.

To distinguish vibration levels from noise levels, the unit is written as “VdB.” Human perception to vibration starts at levels as low as 67 VdB and sometimes lower. Annoyance due to vibration in residential settings starts at approximately 70 VdB. Groundborne vibrations are almost never annoying to people who are outdoors. Although the motion of the ground may be perceived, without the effects associated with the shaking of the building, the motion does not provoke the same adverse human reaction.

Table IV.F-2: Common Sound Levels and Their Noise Sources

| Noise Source | A-Weighted Sound Level in Decibels | Noise Environments | Subjective Evaluations |
|--|------------------------------------|----------------------|------------------------|
| Near Jet Engine | 140 | Deafening | 128 times as loud |
| Civil Defense Siren | 130 | Threshold of Pain | 64 times as loud |
| Hard Rock Band | 120 | Threshold of Feeling | 32 times as loud |
| Accelerating Motorcycle at a few feet away | 110 | Very Loud | 16 times as loud |
| Pile Driver; Noisy Urban Street/ Heavy City Traffic | 100 | Very Loud | 8 times as loud |
| Ambulance Siren; Food Blender | 95 | Very Loud | |
| Garbage Disposal | 90 | Very Loud | 4 times as loud |
| Freight Cars; Living Room Music | 85 | Loud | |
| Pneumatic Drill; Vacuum Cleaner | 80 | Loud | 2 times as loud |
| Busy Restaurant | 75 | Moderately Loud | Reference Level |
| Near Freeway Auto Traffic | 70 | Moderately Loud | |
| Average Office | 60 | Moderate | 1/2 as loud |
| Suburban Street | 55 | Moderate | |
| Light Traffic; Soft Radio Music in Apartment | 50 | Quiet | 1/4 as loud |
| Large Transformer | 45 | Quiet | |
| Average Residence Without Stereo Playing | 40 | Faint | 1/8 as loud |
| Soft Whisper | 30 | Faint | |
| Rustling Leaves | 20 | Very Faint | |
| Human Breathing | 10 | Very Faint | Threshold of Hearing |

Source: Compiled by LSA Associates, Inc., 2015.

Common sources of groundborne vibration include trains and construction activities such as blasting, pile driving and operating heavy earthmoving equipment. Typical vibration source levels from construction equipment are shown in Table IV.F-3. Although the table gives one level for each piece of equipment, it should be noted that there is a considerable variation in reported ground vibration levels from construction activities. The data provides a reasonable estimate for a wide range of soil conditions. In extreme cases, excessive groundborne vibration has the potential to cause structural damage to buildings. For buildings considered of particular historical significance or that are particularly fragile structures, the damage threshold is approximately 96 VdB; the damage threshold for other structures is 100 VdB.¹

¹ Harris, C.M., 1998. *Handbook of Acoustical Measurements and Noise Control*.

c. Regulatory Framework. The federal, State, and local framework for noise standards is outlined below. The City of Redwood City has established standards in the General Plan and in the Municipal Code for land use projects that could potentially expose sensitive receptors to excessive noise levels.

(1) Federal Regulations. In 1972 Congress enacted the Noise Control Act. This act authorized the (USEPA) to publish descriptive data on the effects of noise and establish levels of sound *requisite to protect the public welfare with an adequate margin of safety*. These levels are separated into health (hearing loss levels) and welfare (annoyance levels), as shown in Table IV.F-4. The USEPA cautions that these identified levels are not standards because they do not take into account the cost or feasibility of the levels.

For protection against hearing loss, 96 percent of the population would be protected if sound levels are less than or equal to an $L_{eq(24)}$ of 70 dBA. The “(24)” signifies an L_{eq} duration of 24 hours. The USEPA activity and interference guidelines are designed to ensure reliable speech communication at about 5 feet in the outdoor environment. For outdoor and indoor environments, interference with activity and annoyance should not occur if levels are below 55 dBA and 45 dBA, respectively. The noise effects associated with an outdoor L_{dn} of 55 dBA are summarized in Table IV.F-5. At 55 dBA L_{dn} , 95 percent sentence clarity (intelligibility) may be expected at 11 feet, and no community reaction. However, 1 percent of the population may complain about noise at this level and 17 percent may indicate annoyance.

(2) State of California Regulations. The State of California has established regulations that help prevent adverse impacts to occupants of buildings located near noise sources. Referred to as the *State Noise Insulation Standard*, it requires buildings to meet performance standards through design and/or building materials that would offset any noise source in the vicinity of the receptor. State regulations include requirements for the construction of new hotels, motels, apartment houses, and dwellings other than detached single-family dwellings that are intended to limit the extent of noise transmitted into habitable spaces. These requirements are found in the California Code of Regulations, Title 24 (known as the Building Standards Administrative Code), Part 2 (known as the California Building Code), Appendix Chapters 12 and 12A. For limiting noise transmitted between adjacent dwelling units, the noise insulation standards specify the extent to which walls, doors, and floor ceiling assemblies must block or absorb sound. For limiting noise from exterior noise sources, the noise insulation standards set an interior standard of 45 dBA CNEL in any habitable room with all doors and windows closed. In addition, the standards require preparation of an acoustical analysis demonstrating the manner in which dwelling units have been designed to meet this interior standard, where such units are proposed in an area with exterior noise levels greater than 60 dBA CNEL.

Table IV.F-3: Summary of Human Effects in Areas Exposed to 55 dBA CNEL

| Type of Effects | Magnitude of Effect |
|----------------------------|--|
| Speech – Indoors | 100 percent sentence intelligibility (average) with a 5 dB margin of safety. |
| Speech – Outdoors | 100 percent sentence intelligibility (average) at 1.4 feet. 99 percent sentence intelligibility (average) at 3.2 feet. 95 percent sentence intelligibility (average) at 11.5 feet. |
| Average Community Reaction | None evident; 7 dB below level of significant complaints and threats of legal action and at least 16 dB below “vigorous action.” |
| Complaints | 1 percent dependent on attitude and other non-level related factors. |
| Annoyance | 17 percent dependent on attitude and other non-level related factors. |
| Attitude Towards Area | Noise essentially the least important of various factors. |

Source: U.S. Environmental Protection Agency, 1974. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. March.

(3) City of Redwood City. The City of Redwood City sets noise standards in the Redwood City General Plan and noise ordinance of the Municipal Code. The City’s General Plan Public Safety Element² identifies land use compatibility guidelines, as shown in Table IV.F-4 below. In addition, The City of Redwood City identifies goals and policies that are designed to minimize the impact of point source noise and ambient noise levels throughout the community and minimize the impacts of transportation-related noise. Policies applicable to the proposed project include the following:

- Policy PS-13.1: Minimize the impacts of transportation-related noise.
- Policy PS-13.3: Consider noise impacts as part of the development review process, particularly the location of parking, ingress/egress/loading, and refuse collection areas relative to surrounding residential development and other noise-sensitive land uses.
- Policy PS-13.5: Limit the hours of operation at all noise generation sources that are adjacent to noise sensitive areas, wherever practical.
- Policy PS-13.6: Require all exterior noise sources (construction operations, air compressors, pumps, fans, and leaf blowers) to use available noise suppressions devices and techniques to bring exterior noise down to acceptable levels that are compatible with adjacent land uses.
- Policy PS-13.7: Require that mixed-use structures be designed to account for noise from adjacent uses, and minimize transfer of noise and vibration from commercial/retail to residential use.
- Policy PS-13.8: Implement appropriate standard construction noise controls for all construction projects.
- Policy PS-13.9: Require noise created by new non-transportation noise sources to be mitigated so as not to exceed acceptable interior and exterior noise level standards.

² Redwood City, City of, 2010. *Redwood City General Plan*. October 11.

- Policy PS-13.10: Do not allow new residential or other noise sensitive land use development in noise impacted areas unless effective mitigation measures are incorporated into the project design to reduce outdoor activity area noise levels.
- Policy PS-14.1: Consult with responsible federal and State agencies to minimize the impact of transportation-related noise, including noise associated with freeways, major arterials, rail lines, and airports.
- Policy PS-14.2: Require that proposed land use policy actions (such as a General Plan amendment, Zoning amendment, or a Precise Plan) within the identified aircraft noise contours for San Carlos Airport are:
 - Reviewed by the Airport Land Use Commission (C/CAG Board)
 - Mitigated for potential noise impacts, as appropriate to applicable City noise standards, by the developer
 - Consistent with the Aircraft Noise/Land Use Compatibility Standards in the San Mateo County Airport Land Use Plan.
- Policy PS-14.4: Require development that is, or will be, affected by railroad noise and/or vibration to include appropriate measures to minimize adverse noise effects on residents and business persons.
- Policy PS-14.5: Provide, as appropriate, funding to monitor noise levels and investigate noise complaints.

In addition, the City of Redwood City regulates noise in the City's Municipal Code.³ Section 24.30 through 24.34, Excessive and Unreasonable Noises apply to construction noise. This ordinance limits construction and demolition activities to the hours of 7:00 a.m. to 8:00 p.m. on weekdays when activities are occurring within 500 feet of a residential district. Construction and demolition activities are not permitted on weekends. The ordinance also limits noise levels generated by an individual item of equipment to no more than 110 dB measured within a residential district of the City at any distance of 25 feet from the equipment. Any construction site within 500 feet of a residential area must post a sign at all entrances to the work site prior to commencement of the work for the purpose of informing all contractors and subcontractors and all other persons at the property of the basic limitations upon noise and construction activities provided in the noise ordinance. Section 24.21, Prohibited Noise Levels in Residential Districts limits noise between the hours of 8:00 p.m. and 8:00 a.m. to no more than 6 dB above the local ambient measured noise level within a residential district.

³ Redwood City, City of, 2017. *City Code of Redwood City, California*. April 26.

Table IV.F-4: Land Use Compatibility

| Land Use Category | Community Noise Equivalent Level (CNEL), dB | | | | | | |
|---|---|-------|-------|-------|-------|-------|-------|
| | 55 | 60 | 65 | 70 | 75 | 80 | 85 |
| Residential – Low Density | Light | Light | Light | Light | Light | Light | Light |
| Residential – Medium/Medium-High Density | Light | Light | Light | Light | Light | Light | Light |
| Residential – High Density | Light | Light | Light | Light | Light | Light | Light |
| Mixed-Use Districts | Light | Light | Light | Light | Light | Light | Light |
| Commercial – Neighborhood | Light | Light | Light | Light | Light | Light | Light |
| Commercial – Regional | Light | Light | Light | Light | Light | Light | Light |
| Commercial – Office Professional/Technology | Light | Light | Light | Light | Light | Light | Light |
| Marina | Light | Light | Light | Light | Light | Light | Light |
| Hospital | Light | Light | Light | Light | Light | Light | Light |
| Industrial/Port | Light | Light | Light | Light | Light | Light | Light |
| Public Facilities/Schools | Light | Light | Light | Light | Light | Light | Light |
| Open Space/Recreation | Light | Light | Light | Light | Light | Light | Light |

| | | |
|--------------------------|--|--|
| Normally Acceptable | | Specified land use is satisfactory, assuming buildings are of conventional construction. |
| Conditionally Acceptable | | New development should be undertaken only after detailed analysis of noise reduction requirements are made. |
| Normally Unacceptable | | New development should be generally discouraged, if not, a detailed analysis of noise reduction requirements must be made. |
| Unacceptable | | New construction or development should generally not be undertaken. |

Source: City of Redwood City, 2010.

d. Existing Noise Environment. The ambient noise environment in the City of Redwood City is affected by a variety of noise sources, including traffic, rail, and airport noise sources. In Redwood City, vehicular traffic on US 101, I-280, and other major roadways; railroad operations; and the San Carlos Airport are the predominant sources of noise. Other sources of noise within Redwood City include industrial and commercial businesses, outdoor activities, and construction. The following section describes the existing noise environment and identifies the primary noise sources in the vicinity of the project site.

(1) Existing Ambient Monitored Noise Levels. The existing noise environment in the project vicinity is dominated by traffic on US 101. Other noise sources in the area include operations of the Graniterock concrete and asphalt processing plant located to the east, truck traffic on Blomquist Street and Seaport Boulevard, and operations of the freight rail line adjacent to Seaport Boulevard.

No portion of the project site lies within the lowest published noise contour (a community noise exposure level of 55 decibels), and aircraft noise is not a substantial contributor to existing noise levels in the area.

The analysis contained in the IHSP Draft EIR identifies long-term noise monitoring at three locations and modeling of highway noise within the IHSP study area. These data were used to generate the noise contours presented in Figure 4.10-1 of the IHSP Draft EIR. Noise contours are presented for 75 dBA and 70 dBA CNEL. Based on Figure 4.10-1, the project site is exposed to noise levels of 75 dBA CNEL within 170 feet of US 101 and up to 70 dBA CNEL beyond 170 feet of US 101.

(2) Existing Traffic Noise. Motor vehicles with their distinctive noise characteristics are a major source of noise in Redwood City. The amount of noise varies according to many factors, such as volume of traffic, vehicle mix (percentage of cars and trucks), average traffic speed, and distance from the observer. Major contributing roadway noise sources in the project vicinity include US 101, as well as other arterial and collector roadways throughout the City.

Existing roadway traffic noise levels in the project vicinity were assessed using the Federal Highway Administration (FHWA) highway traffic noise prediction model (FHWA RD-77-108). This model uses a typical vehicle mix for urban/suburban areas in California and requires parameters, including traffic volumes, vehicle speed, and roadway geometry, to compute typical equivalent noise levels during daytime, evening, and nighttime hours. The resultant noise levels are weighted and summed over 24-hour periods to determine the community noise equivalent level (CNEL) values. Existing traffic noise contours along modeled roadway segments are shown in Table IV.F-7. These noise levels represent the worst-case scenario, which assumes that no shielding is provided between the traffic and the location where the noise contours are drawn. Appendix C provides the specific assumptions used in developing these noise levels and model printouts.

Table IV.F-7: Existing Traffic Noise Levels Without Project

| Roadway Segment | ADT | Centerline to 70 dBA CNEL (feet) | Centerline to 65 dBA CNEL (feet) | Centerline to 60 dBA CNEL (feet) | CNEL (dBA) 50 feet from Centerline of Outermost Lane |
|---|---------|----------------------------------|----------------------------------|----------------------------------|--|
| Maple Street – north of Blomquist Street | 2,810 | < 50 | < 50 | < 50 | 57.1 |
| Maple Street – south of Blomquist Street | 4,500 | < 50 | < 50 | < 50 | 59.1 |
| Blomquist Street – east of Maple Street | 4,470 | < 50 | < 50 | < 50 | 57.2 |
| Blomquist Street – west of Maple Street | 0 | < 50 | < 50 | < 50 | 20.7 |
| Maple Street – north of Veterans Boulevard | 5,850 | < 50 | < 50 | 58 | 60.3 |
| Veterans Boulevard – east of Maple Street | 12,060 | < 50 | 61 | 122 | 63.5 |
| Veterans Boulevard – west of Maple Street | 14,600 | < 50 | 68 | 138 | 64.3 |
| Blomquist Street – west of Seaport Boulevard | 4,710 | < 50 | < 50 | < 50 | 57.5 |
| Seaport Boulevard – north of Blomquist Street | 15,370 | < 50 | 70 | 143 | 64.6 |
| Seaport Boulevard – south of Blomquist Street | 17,848 | < 50 | 76 | 157 | 65.2 |
| Whipple Avenue – south of US 101 NB Ramps | 12,790 | < 50 | 63 | 127 | 63.8 |
| 101 NB Ramps – east of Whipple Ave | 4,190 | < 50 | < 50 | 90 | 63.1 |
| 101 NB Ramps – west of Whipple Ave | 15,300 | < 50 | 99 | 213 | 68.7 |
| East Bayshore Road – east of Bair Island Road | 20 | < 50 | < 50 | < 50 | 33.7 |
| US 101 | 221,000 | 507 | 1,089 | 2,344 | 81.6 |

Note: Traffic noise within 50 feet of the roadway centerline should be evaluated with site-specific information.

ADT = average daily traffic

CNEL = Community Noise Equivalent Level

dBA = A-weighted decibels

Source: LSA, October 2017.

(3) Existing Aircraft Noise. Airport related noise levels are primarily associated with aircraft engine noise made while aircraft are taking off, landing, or running their engines while still on the ground. Aircraft overflights contribute to the ambient noise levels in Redwood City. The San Carlos Airport is the closest airport and is located approximately 1.5 mile northwest of the project site. However, no portion of the project site lies within the 60 dBA CNEL noise contours of the airport.

Aircraft overflights associated with the San Francisco International Airport, Oakland International Airport, and San Jose International Airport are also audible from the project site, each of which are located 11 miles northwest, 14 miles north, and 17 miles southeast of the project site, respectively.

(4) Existing Railroad Noise. Trains and train horns represent a frequent noise occurrence in Redwood City. Based on train activity levels documented in 2008, average daily noise levels along the noise railroad lines can be calculated to range from 61 to 70 dBA CNEL.⁴ Maximum noise levels from train passbys are more significant, from 85 to 95 dBA. Near at-grade crossings, where train-warning whistles are sounded to warn pedestrians and motorists of oncoming trains, maximum noise levels can be as high as 90 to 100 dBA at 40 feet from the tracks.⁵

(5) Existing Sensitive Land Uses. Sensitive receptors include residences, schools, hospitals, churches, and similar uses that are sensitive to noise. Project construction and operation could adversely affect nearby noise-sensitive land uses. The closest sensitive receptors include the San Mateo County Correctional Center and Homeless Shelter, which are located adjacent to the project site. In addition, the existing residents of live-aboard vessels in Docketown Marina are located approximately 40 feet north of the project site. Other sensitive receptors near the proposed project include condominium residences located approximately 200 feet northwest of the project site across Redwood Creek.

2. Impacts and Mitigation Measures

This section discusses potential noise and vibration impacts that could result from implementation of the proposed project. The section begins with the criteria of significance, which establish the thresholds used to determine whether an impact is significant. The latter part of this section presents the impacts associated with the proposed project and identifies mitigation measures, as appropriate.

a. Criteria of Significance. Implementation of the proposed project would have a significant impact on the environment related to noise and vibration if it would:

- Expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Expose persons to or generate excessive groundborne vibration and noise levels;
- Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; or
- Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

⁴ Redwood City, City of, 2010, op. cit.

⁵ Ibid.

In *California Building Industry Association (CBIA) v. Bay Area Air Quality Management District (BAAQMD)*, the California Supreme Court⁶ concluded that CEQA generally does not require analysis or mitigation of the impact of existing environmental conditions on a project, including a project's future users or residents. However, as with other laws and regulations enforced by other agencies that protect public health and safety, the City as the lead agency has authority, other than CEQA, to require measures to protect public health and safety. Therefore, this document includes an evaluation of the environment's impacts on the project consistent with the current version of the CEQA Checklist provided in Appendix G of the CEQA Guidelines. The evaluation includes an assessment of the project's potential to locate residential land uses in an area considered to be "unacceptable" in the City's Noise and Land Use Compatibility Guidelines and to expose persons to excessive groundborne vibration.

b. Project Impacts. The following section discusses the potential noise and vibration impacts associated with implementation of the proposed project. Potential impacts would generally be the same for the Partial and Full Blomquist Street Extension, unless otherwise noted.

(1) Expose Persons to or Generate Noise Levels in Excess of Established Standards. The City sets forth normally acceptable noise level standards for land use compatibility and interior noise exposure of new development. The normally acceptable exterior noise level for medium to medium-high density residential units is up to 55 dBA CNEL. Noise levels of 55 to 65 dBA CNEL are considered conditionally acceptable when a detailed analysis of noise reduction requirements and noise insulation features are included in the design to meet the interior noise standard. Noise levels of 65 to 75 dBA are considered normally unacceptable and require a detailed analysis of noise reduction requirements. The normally acceptable interior noise level for residential units is 45 dBA CNEL.

The noise environment at the project site is dominated by vehicle traffic noise on US 101. Based on the existing noise level measurements presented in Figure 4.10-1 of the IHSP Draft EIR, the project site is exposed to noise levels of 75 dBA CNEL within 170 feet of US 101 and up to 70 dBA CNEL beyond 170 feet of US 101. Based on the City's noise and land use compatibility standards, this noise level is considered normally unacceptable. According to the City, development should be generally discouraged, if not, a detailed analysis of noise reduction requirements must be made. Therefore, the land use may be permitted only after detailed analysis of the noise reduction features proposed to be incorporated in the project design. A detailed interior and exterior noise analysis is provided below.

Impact NOI-1: The proposed project and the project variant would locate residential land uses in an area that, based on the City's Noise and Land Use Compatibility Guidelines, is generally considered an unacceptable noise environment for residential land uses. (S)

On-Site Interior Noise Analysis. Assuming a 12-foot by 12-foot master bedroom with 9-foot-high ceilings and two 5-foot by 5-foot windows, sample exterior-to-interior noise reduction calculations were completed for the proposed project. The calculations assume typical stucco construction and two walls exposed to traffic noise. Based on EPA Protective Noise Levels,⁷ with a

⁶ California Supreme Court, 2015. *California Building Industry Association v. Bay Area Air Quality Management District* 62 Cal.4th 369, Case No. S213478. December.

⁷ Environmental Protection Agency, 1978. *Protective Noise Levels, Condensed Version of EPA Levels Document*. November.

combination of walls, doors, and windows, standard construction for Northern California residential buildings (STC-24 to STC-28) would provide more than 25 dBA in exterior-to-interior noise reduction with windows closed and 15 dBA or more with windows open. With windows open, residences would not meet the City's normally acceptable residential interior noise standard of 45 dBA L_{dn} (i.e., 75.0 dBA – 15.0 dBA = 60.0 dBA). Therefore, an alternate form of ventilation, such as an air-conditioning system, would be required to ensure that windows can remain closed for a prolonged period of time for all units at the proposed project. A ventilation system would reduce traffic noise levels for residents with windows closed; however, interior noise levels would still remain above the interior noise level criterion of 45 dBA with windows closed and fresh air ventilation (i.e., 75.0 dBA – 25.0 dBA = 50.0 dBA). Therefore, implementation of Mitigation Measure NOI-1 would be required to reduce interior noise impacts to a less-than-significant level.

Mitigation Measure NOI-1: The project design shall implement the following measures to the satisfaction of the City in order to reduce interior noise impacts in compliance with City noise standards:

- In order for windows and doors to remain closed, mechanical ventilation such as air conditioning shall be provided for all units.
- All windows and glass doors shall be rated STC 33 or higher such that the noise reduction provided will satisfy the interior noise standard of 45 dBA CNEL.
- All exterior walls shall be constructed with a minimum STC rating of STC-46.
- All vent ducts connecting interior spaces to the exterior (i.e., bathroom exhaust, etc.) shall have at least two 90 degree turns in the duct.
- All windows and doors shall be installed in an acoustically-effective manner. Sliding-window panels shall form an air-tight seal when in the closed position and the window frames shall be caulked to the wall opening around the perimeter with a non-hardening caulking compound to prevent sound infiltration. Exterior doors shall seal air-tight around the full perimeter when in the closed position. (LTS)

Implementation of Mitigation Measure NOI-1 would result in a 30.2 dBA exterior-to-interior noise reduction, with a minimum standard transmissions class (STC) wall rating of STC-46⁸ and window rating of STC-33⁹ (shown in Appendix E). With windows closed, interior noise levels at the bedrooms exposed to an exterior noise level approaching 75 dBA would be 44.8 dBA (i.e., 75.0 dBA – 30.2 dBA = 44.8 dBA), which is below the 45 dBA CNEL interior noise standard with windows closed for noise-sensitive land uses. Therefore, with implementation of Mitigation Measure NOI-1, noise impacts associated with traffic would be less than significant.

On-Site Exterior Noise Analysis. As identified above, noise levels on the project site would be up to 75 dBA CNEL. Based on the City's noise and land use compatibility standards, this noise level is within the City's normally unacceptable noise level of 65 to 75 dBA CNEL. According to the City, development should be generally discouraged, or a detailed analysis of noise reduction requirements must be prepared. The existing on-site noise level would meet the City's exterior noise

⁸ Harris, David A., 1997. *Noise Control Manual for Residential Buildings*. July.

⁹ Milgard, 2008. *Sound Transmission Loss Test Report No. TL08-149*. February.

level standards if noise reduction requirements and noise insulation features are included in the design to meet the interior noise standard. As discussed above, interior noise levels would meet the City's standards with implementation of Mitigation Measure NOI-1. Because normally unacceptable noise levels are considered acceptable when interior noise levels are met per City standards, the project would be considered an acceptable land use under the City's noise land use compatibility standards, resulting in a less-than-significant impact with mitigation.

Off-Site Exterior Noise Analysis. Operational noise can be categorized as mobile source noise and stationary source noise. Mobile source noise would be attributable to the additional trips that would be a result of the proposed project and is discussed below under the discussion related to permanent increases in exterior noise. Stationary source noise includes noise generated by the residential uses of the site, such as heating, ventilation, and air conditioning (HVAC) equipment. Implementation of the proposed project would generate minimal onsite stationary noise sources, from HVAC equipment. The nearest sensitive receptors in the vicinity of the project site are the San Mateo County Correctional Center and Homeless Shelter, which are located within 10 feet of the project site boundary and approximately 30 feet from the proposed townhome units.

HVAC equipment is typically the primary noise source associated with residential uses. HVAC equipment is often mounted on rooftops, located on the ground, or located within mechanical rooms. The noise sources could take the form of fans, pumps, air compressors, chillers, or cooling towers. HVAC operations would be required to meet all noise standards.

Precise details of HVAC equipment, including future location and sizing, are unknown at this time; therefore, for purposes of this analysis, 75 dBA at 3 feet was assumed to represent HVAC-related noise.¹⁰ Adjusted for distance to the nearest off-site sensitive receptors, the off-site residences would be exposed to a noise level of 55 dBA L_{max} generated by HVAC equipment. The City does not specify maximum noise limits for operational noise sources; however, this noise level would be lower than existing noise levels at the project site and would be within the City's normally acceptable noise standards of exterior noise level for medium to medium-high density residential units is up to 55 dBA CNEL. Therefore, operational noise associated with the proposed project would not be expected to substantially increase noise levels and impacts would be less than significant.

In addition, the proposed project would generate short-term noise associated with construction activities. The temporary increase in ambient noise associated with construction is discussed below.

(2) Groundborne Vibration and Groundborne Noise. Vibration refers to groundborne noise and perceptible motion. Groundborne vibration is almost exclusively a concern inside buildings and is rarely perceived as a problem outdoors. Vibration energy propagates from a source, through intervening soil and rock layers, to the foundations of nearby buildings. The vibration then propagates from the foundation throughout the remainder of the structure. Building vibration may be perceived by the occupants as the motion of building surfaces, rattling of items on shelves or hanging on walls, or as a low-frequency rumbling noise. The rumbling noise is caused by the vibrating walls, floors, and ceilings radiating sound waves. Annoyance from vibration often occurs when the vibration exceeds

¹⁰ Trane, 2002. *Sound Data and Application Guide for the New and Quieter Air-Cooled Series R Chiller*.

the threshold of perception by 10 dB or less. This is an order of magnitude below the damage threshold for normal buildings.

Typical sources of groundborne vibration are construction activities (e.g., pavement breaking and operating heavy-duty earthmoving equipment), and occasional traffic on rough roads. In general, groundborne vibration from standard construction practices is only a potential issue when it occurs within 25 feet of sensitive uses. Groundborne vibration levels from construction activities very rarely reach levels that can damage structures; however, these levels are perceptible near the active construction site. With the exception of old buildings built prior to the 1950s or buildings of historic significance, potential structural damage from heavy construction activities rarely occurs. When roadways are smooth, vibration from traffic (even heavy trucks) is rarely perceptible.

The streets surrounding the project area are paved, smooth, and unlikely to cause significant groundborne vibration. In addition, the rubber tires and suspension systems of buses and other on-road vehicles make it unusual for on-road vehicles to cause groundborne noise or vibration problems. It is therefore assumed that no such vehicular vibration impacts would occur and, therefore, no vibration impact analysis of on-road vehicles is necessary. Additionally, once constructed, the proposed project would not contain uses that would generate groundborne vibration.

Construction Vibration. The nearest sensitive receptors that may be subject to vibration impacts include the One Marina condominium residences located approximately 200 feet northwest of the project site across Redwood Creek. This construction vibration impact analysis discusses the level of human annoyance using vibration levels in VdB and will assess the potential for building damages using vibration levels in PPV (in/sec) because vibration levels calculated in RMS are best for characterizing human response to building vibration, while vibration level in PPV is best used to characterize potential for damage. The Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment¹¹ guidelines indicate that a vibration level up to 102 VdB (an equivalent to 0.5 in/sec in PPV) is considered safe for buildings consisting of reinforced concrete, steel, or timber (no plaster), and would not result in any construction vibration damage. For a non-engineered timber and masonry building, the construction vibration damage criterion is 94 VdB (0.2 in/sec in PPV).

Table IV.F-8 shows the PPV and VdB values at 25 feet from a construction vibration source. As shown in Table IV.F-8, bulldozers and other heavy-tracked construction equipment (except for pile drivers and vibratory rollers) generate approximately 87 VdB of groundborne vibration when measured at 25 feet, based on the Transit Noise and Vibration Impact Assessment. At this level, groundborne vibration would result in potential annoyance to residences and workers, but would not cause any damage to the buildings. Construction vibration, similar to vibration from other sources, would not have any significant effects on outdoor activities (e.g., those outside of residences and commercial/office buildings in the project vicinity). Outdoor site preparation for the project is expected to use a bulldozer and loaded truck. The greatest levels of vibration are anticipated to occur during the site preparation phase. All other phases are expected to result in lower vibration levels. The distance to the nearest buildings for vibration impact analysis is measured between the nearest off-site

¹¹ Federal Transit Administration, 2006. Office of Planning and Environment. *Transit Noise and Vibration Impact Assessment*. FTA-VA-90-1003-06. May.

buildings and the project boundary (assuming the construction equipment would be used at or near the project boundary) because vibration impacts occur normally within the buildings. The formula for vibration transmission is provided below.

$$L_v\text{dB (D)} = L_v\text{dB (25 ft)} - 30 \text{ Log (D/25)}$$

$$\text{PPV}_{\text{equip}} = \text{PPV}_{\text{ref}} \times (25/\text{D})^{1.5}$$

Table IV.F-8: Vibration Source Amplitudes for Construction Equipment

| Equipment | Reference PPV/L _v at 25 feet | |
|------------------------------------|---|-----------------------------------|
| | PPV (in/sec) | L _v (VdB) ¹ |
| Pile Driver (Impact), Typical | 0.644 | 104 |
| Pile Driver (Sonic), Typical | 0.170 | 93 |
| Vibratory Roller | 0.210 | 94 |
| Hoe Ram | 0.089 | 87 |
| Large Bulldozer² | 0.089 | 87 |
| Caisson Drilling | 0.089 | 87 |
| Loaded Trucks | 0.076 | 86 |
| Jackhammer | 0.035 | 79 |
| Small Bulldozer | 0.003 | 58 |

¹ RMS vibration velocity in decibels (VdB) is 1 μin/sec.

² Equipment shown in **bold** is expected to be used on site.

μin/sec = micro-inches per second

FTA = Federal Transit Administration

in/sec = inches per second

L_v = velocity in decibels

PPV = peak particle velocity

RMS = root-mean-square

VdB = vibration velocity decibels

Sources: *Transit Noise and Vibration Impact Assessment* (FTA 2006).

For typical construction activity, the equipment with the highest vibration generation potential is the large bulldozer, which would generate 87 VdB at 25 feet. The closest residential structures are located 40 feet from the project construction boundary. Based on distance attenuation, the closest residences would experience vibration levels of up to 60 VdB (0.004 PPV [in/sec]). This vibration level at the closest residential structures from construction equipment or would not exceed the FTA threshold of 94 VdB (0.2 in/sec PPV) for building damage. This level is also below the FTA’s “barely perceptible” human response criteria of 0.04 PPV for transient sources of vibration events. Therefore, groundborne vibration impacts from project-related construction activities would be considered less than significant.

(3) Permanent Increase in Ambient Noise. The following section addresses possible noise level increases in the project vicinity resulting from implementation of the proposed project.

Traffic Noise Levels. To assess traffic noise impacts, the traffic noise levels along major roadway segments within the project vicinity were projected using FHWA modeling to predict traffic noise level conditions with and without the proposed project. FHWA modeling was based on existing traffic conditions. The FHWA modeling results are summarized in Table IV.F-9. The table includes projected traffic noise levels as measured at 50 feet from the centerline of the outermost traveled lane along the modeled roadway segments. The model does not account for existing sound walls or terrain features that could reduce traffic noise levels at adjacent land uses, but rather assumes a reasonable worst-case direct line-of-sight over hard surface to the modeled traffic noise sources. Appendix E provides the specific assumptions used in developing these noise levels and model printouts.

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Table IV.F-9: Existing Traffic Noise Levels Without and With the Proposed Project and the Project Variant

| Roadway Segment | Existing (2017) Traffic Volumes | | | | | | Cumulative Traffic Volumes | | | | | | |
|--|---------------------------------|--|-------------------------------|--|--|-----------------------|--|--|-----------------|--|--------------|--|--|
| | Without Project | | With Proposed Project Variant | | | With Proposed Project | | | Without Project | | With Project | | |
| | ADT | CNEL (dBA) 50 feet from Centerline of Outermost Lane | ADT | CNEL (dBA) 50 feet from Centerline of Outermost Lane | Increase from Baseline Conditions | ADT | CNEL (dBA) 50 feet from Centerline of Outermost Lane | Increase from Baseline Conditions | ADT | CNEL (dBA) 50 feet from Centerline of Outermost Lane | ADT | CNEL (dBA) 50 feet from Centerline of Outermost Lane | Increase from Baseline Conditions |
| Maple Street – north of Blomquist Street | 2,810 | 57.1 | 3,020 | 57.4 | 0.3 | 3,560 | 58.1 | 1.0 | 8,600 | 61.9 | 8,700 | 62.0 | 0.1 |
| Maple Street – south of Blomquist Street | 4,500 | 59.1 | 6,130 | 60.5 | 1.4 | 4,820 | 59.4 | 0.3 | 12,700 | 63.6 | 12,800 | 63.7 | 0.1 |
| Blomquist Street – east of Maple Street | 4,470 | 57.2 | 8,700 | 60.1 | 2.9 | 4,900 | 57.6 | 0.4 | 15,600 | 62.7 | 15,700 | 62.7 | 0.0 |
| Blomquist Street – west of Maple Street | N/A | N/A | 5,650 | 58.2 | 37.5 | N/A | N/A | N/A | 12,600 | 61.7 | 12,800 | 61.8 | 0.1 |
| Maple Street – north of Veterans Boulevard | 5,850 | 60.3 | 7,480 | 61.3 | 1.0 | 6,180 | 60.5 | 0.2 | 15,900 | 64.6 | 16,000 | 64.6 | 0.0 |
| Veterans Boulevard – east of Maple Street | 12,060 | 63.5 | 13,290 | 63.9 | 0.4 | 12,130 | 63.5 | 0.0 | 22,200 | 66.2 | 22,200 | 66.2 | 0.0 |
| Veterans Boulevard – west of Maple Street | 14,600 | 64.3 | 14,900 | 64.4 | 0.1 | 14,960 | 64.4 | 0.1 | 25,800 | 66.8 | 25,800 | 66.8 | 0.0 |
| Blomquist Street – west of Seaport Boulevard | 4,710 | 57.5 | 8,940 | 60.2 | 2.7 | 5,150 | 57.8 | 0.3 | 15,500 | 62.6 | 15,700 | 62.7 | 0.1 |
| Seaport Boulevard – north of Blomquist Street | 15,370 | 64.6 | 15,410 | 64.6 | 0.0 | 15,410 | 64.6 | 0.0 | 17,600 | 65.1 | 17,600 | 65.1 | 0.0 |
| Seaport Boulevard – south of Blomquist Street | 17,848 | 65.2 | 18,070 | 65.3 | 0.1 | 18,200 | 65.3 | 0.1 | 25,800 | 66.8 | 26,000 | 66.8 | 0.0 |
| Whipple Avenue – south of US 101 NB Ramps | 12,790 | 63.8 | 12,830 | 63.8 | 0.0 | 12,790 | 63.8 | 0.0 | 17,200 | 65.0 | 17,200 | 65.0 | 0.0 |
| 101 NB Ramps – east of Whipple Ave | 4,190 | 63.1 | 4,350 | 63.3 | 0.2 | 4,170 | 63.1 | 0.0 | 12,000 | 67.7 | 12,200 | 67.7 | 0.0 |
| 101 NB Ramps – west of Whipple Ave | 15,300 | 68.7 | 15,500 | 68.8 | 0.1 | 15,300 | 68.7 | 0.0 | 24,000 | 70.7 | 24,200 | 70.7 | 0.0 |
| East Bayshore Road – east of Bair Island Road | 20 | 33.7 | 4,540 | 57.3 | 23.6 | 20 | 33.7 | 0.0 | 11,600 | 61.4 | 11,700 | 61.4 | 0.0 |
| East Bayshore Road – west of Bair Island Road | 4,140 | 56.9 | 6,420 | 58.8 | 1.9 | 4,140 | 56.9 | 0.0 | 20,760 | 63.9 | 20,800 | 63.9 | 0.0 |
| Bair Island Road – north of East Bayshore Road | 4,160 | 56.9 | 4,160 | 56.9 | 0.0 | 4,160 | 56.9 | 0.0 | 19,900 | 63.7 | 19,900 | 63.7 | 0.0 |

Note: Traffic noise within 50 feet of the roadway centerline should be evaluated with site-specific information.

Shaded cells indicate roadways adjacent to the project site.

ADT = average daily traffic

CNEL = Community Noise Equivalent Level

dB(A) = A-weighted decibels

NA = not applicable

Source: LSA, October 2017.

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As discussed in Chapter III, Project Description, the proposed project would provide a 0.87-acre dedication of land for future development of the Blomquist Street Extension at the southern property line. As an option or variant to the project as proposed, the applicant and City are discussing constructing the Blomquist Street extension concurrently with this development. The analysis below evaluates the proposed project and the proposed project variant.

With implementation of the proposed project, the largest increase in traffic-related noise as a result of the proposed project would be under Existing Plus Project conditions on Blomquist Street east of Maple Street, with an approximately 0.4 dBA increase over existing conditions. This noise level increase is well below the 3 dBA increase considered to be perceptible by the human ear in an outdoor environment and the resulting noise level would be 57.6 dBA CNEL, which would also be lower than existing noise associated with other surrounding roadways and would be in the conditionally acceptable range for medium to medium-high density residential land uses. Therefore, under either the proposed project or the project variant, traffic-related on-site noise impacts would be less than significant and no mitigation measures are required.

With implementation of the proposed project variant, the largest increases in traffic-related noise as a result of the project would be under Existing Plus Project conditions (with the Partial Blomquist Street Extension to Redwood Creek) on Blomquist Street west of Maple Street (37.5 dBA increase). This increase in traffic would occur due to the Blomquist Street Extension. This noise level increase would exceed the 3 dBA increase considered to be perceptible by the human ear in an outdoor environment. However, the resulting noise level along Blomquist Street west of Maple Street would be 58.2 dBA CNEL, which would be lower than existing noise associated with other surrounding roadways and would be in the conditionally acceptable range for medium to medium-high density residential land uses. The next largest traffic noise level increase associated with implementation of the proposed project variant would be on Blomquist Street east of Maple Street, with an approximately 2.9 dBA increase over existing conditions. This noise level increase is less than the 3 dBA increase considered to be perceptible by the human ear in an outdoor environment and the resulting noise level would be 60.1 dBA CNEL, which would also be lower than existing noise associated with other surrounding roadways and would be in the conditionally acceptable range for medium to medium-high density residential land uses.

(4) Temporary Increase in Ambient Noise. Construction associated with the proposed project would occur over a period of approximately 33 months. Construction activities associated with the proposed project could result in substantial temporary or periodic increases in ambient noise levels. Maximum construction noise would be short-term, generally intermittent depending on the construction phase, and variable depending on receiver distance from the active construction zone. The duration of noise impacts generally would be from one day to several days depending on the phase of construction. The level and types of noise impacts that would occur during construction are described below.

Impact NOI-2: Noise from construction activities would result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. (S)

Short-term noise impacts would occur during grading and site preparation activities. Table IV.F-10 lists typical construction equipment noise levels (L_{max}) recommended for noise impact assessments, based on a distance of 50 feet between the equipment and a noise receptor, obtained from the FHWA Roadway Construction Noise Model. Construction-related short-term noise levels would be higher than existing ambient noise levels currently in the project area but would no longer occur once construction of the project is completed.

Table IV.F-10: Noise Emission Reference Levels and Usage Factors

| Equipment Description | Acoustical Usage Factor ¹ | Predicted L_{max} at 50 feet (dBA, slow) ² | Actual Measured L_{max} at 50 feet (dBA, slow) ³ |
|----------------------------|--------------------------------------|---|---|
| All Other Equipment > 5 HP | 50 | 85 | N/A ⁴ |
| Backhoe | 40 | 80 | 78 |
| Compressor (air) | 40 | 80 | 78 |
| Concrete Mixer Truck | 40 | 85 | 79 |
| Dozer | 40 | 85 | 82 |
| Dump Truck | 40 | 84 | 76 |
| Excavator | 40 | 85 | 81 |
| Flat Bed Truck | 40 | 84 | 74 |
| Front-End Loader | 40 | 80 | 79 |
| Generator | 50 | 82 | 81 |
| Grader | 40 | 85 | N/A |
| Grapple (on backhoe) | 40 | 85 | 87 |
| Man Lift | 20 | 85 | 75 |
| Paver | 50 | 85 | 77 |
| Pickup Truck | 40 | 55 | 75 |
| Pneumatic Tools | 50 | 85 | 85 |
| Roller | 20 | 85 | 80 |
| Tractor | 40 | 84 | N/A |
| Welder/Torch | 40 | 73 | 74 |

Note: Noise levels reported in this table are rounded to the nearest whole number.

¹ Usage factor is the percentage of time during a construction noise operation that a piece of construction equipment is operating at full power.

² Maximum noise levels were developed based on Specification (Spec.) 721.560 from the Central Artery/Tunnel (CA/T) program to be consistent with the City of Boston's Noise Code for the "Big Dig" project.

³ The maximum noise level was developed based on the average noise level measured for each piece of equipment during the CA/T program in Boston, Massachusetts.

⁴ Since the maximum noise level based on the average noise level measured for this piece of equipment was not available, the maximum noise level developed based on Spec 721.560 would be used.

dBA = A-weighted decibels

N/A = not applicable

HP = horsepower

RCNM = Roadway Construction Noise Model

L_{max} = maximum instantaneous noise level

VMS = variable message sign

kVA = kilovolt-amperes

Source: FHWA Highway Construction Noise Handbook, Table 9.1 (FHWA 2006).

Two types of short-term noise impacts could occur during construction of the proposed project. The first type involves construction crew commutes and the transport of construction equipment and materials to the site for the proposed project, which would incrementally increase noise levels on roads leading to the site. As shown in Table IV.F-10, there would be a relatively high single-event noise exposure potential at a maximum level of 84 dBA L_{max} with trucks passing at 50 feet.

The second type of short-term noise impact is related to noise generated during excavation, grading, and construction on the project site. Construction is performed in discrete steps, or phases, each with its own mix of equipment and, consequently, its own noise characteristics. These various sequential phases would change the character of the noise generated on site. Therefore, the noise levels vary as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase.

Table IV.F-10 lists maximum noise levels recommended for noise impact assessments for typical construction equipment, based on a distance of 50 feet between the equipment and a noise receptor. Typical average noise levels range up to 86 dBA L_{max} at 50 feet during the noisiest construction phases when multiple pieces of equipment would operate at once. The site preparation phase, including excavation and grading of the site, tends to generate the highest noise levels because earthmoving machinery is the noisiest construction equipment. Earthmoving equipment includes excavating machinery such as backfillers, bulldozers, draglines, and front loaders. Earthmoving and compacting equipment includes compactors, scrapers, and graders. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full-power operation followed by 3 or 4 minutes at lower power settings.

The closest sensitive receptors include the San Mateo County Correctional Center and Homeless Shelter, which are located within 10 feet of the project site boundary where some construction would occur. At 10 feet, there would be an increase of approximately 14 dBA from the increased distance compared to the noise level measured at 50 feet from the active construction area. Therefore, the closest sensitive receptors may be subject to short-term construction noise reaching 100 dBA L_{max} when construction is occurring at the project site boundary. This noise level would be below the City's construction noise standard of 110 dBA at 25 feet. In addition, construction noise would be intermittent and sporadic as construction occurs over the entirety of the project site. Noise levels would attenuate at sensitive receptors as construction activity moves further into the site due to distance divergence factors.

However, while construction noise levels would not be expected to result in a substantial temporary or periodic increase in ambient noise levels, they could still result in disturbances of noise sensitive receptors in the project vicinity. Therefore, to ensure compliance with the Municipal Code and to reduce any potential noise impacts to off-site sensitive receptors to a less-than-significant level, Mitigation Measure NOI-2 shall be implemented.

Mitigation Measure NOI-2: The project contractor shall implement the following measures during construction of the proposed project:

- Equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers consistent with manufacturers' standards.
- Place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the active project site.
- Locate equipment staging in areas that would create the greatest possible distance between construction-related noise sources and noise-sensitive receptors nearest the active project site during all project construction.

- Ensure that all general construction related activities are restricted to between the hours of 7:00 a.m. and 8:00 p.m. on weekdays. No construction shall be permitted on weekends or holidays.
- Post a sign at all entrances to the work site prior to commencement of the work for the purpose of informing all contractors and subcontractors and all other persons at the property of the basic limitations upon noise and construction activities provided in the noise ordinance.
- Designate a “disturbance coordinator” at the City of Redwood City who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaint (e.g., starting too early, bad muffler) and would determine and implement reasonable measures warranted to correct the problem. (LTS)

Implementation of Mitigation Measure NOI-2 would limit construction activities to the less noise-sensitive periods of the day and would reduce construction impacts to a less-than-significant level.

c. Cumulative Impacts. Implementation of the proposed project would result in potentially adverse noise impacts from construction activities. However, construction-related noise impacts would be temporary and would no longer occur once construction of the project is completed. Project construction activities would conform to the City’s construction noise standards with implementation of Mitigation Measures NOI-2. Additionally, any other proposed project in the surrounding study area would also be required to comply with the applicable City standards, therefore, the project’s construction activities would not be considered a cumulatively considerable contribution to the total noise environment in the project vicinity and this impact would be less than significant.

A significant cumulative impact would also occur if implementation of the proposed project would result in any permanent increase of 3 dBA or more in traffic noise levels at existing sensitive receptors in the project vicinity that are currently exposed to traffic noise levels above the City’s normally acceptable threshold for that type of land use. As shown in Table IV.F-9, under cumulative conditions, the largest increase in traffic would be on Blomquist Street west of Maple Street and East Bayshore Road east of Bair Island Road, with implementation of the Full Blomquist Street Extension to East Bay Shore Road. The noise level increase would exceed 3 dBA, however resulting noise levels would be lower than existing noise associated with other surrounding roadways and would be within the conditionally acceptable range for medium to medium-high density residential land uses. All other project-related traffic noise levels would range from 0.0 to 2.9 dBA along the segments analyzed, therefore, off-site cumulative traffic noise impacts would be less than significant.

G. HAZARDS AND HAZARDOUS MATERIALS

This section provides an overview of the potential presence of hazardous materials and other public health hazards on and near the proposed project site and assesses potential impacts to public health and safety and the environment that could result from implementation of the proposed project. Potential impacts related to hazardous conditions associated with implementation of proposed project and the project variant are described where those impacts might differ, and mitigation measures are identified, where required. Impacts related to hazardous conditions associated with the proximity of public and private airports and wildland fires are evaluated in the Initial Study prepared for the proposed project (see Appendix B) and these impacts were determined to be less than significant.

1. Setting

This section describes the existing conditions related to hazardous materials at and near the proposed project site, as well as applicable regulatory agency framework and local policies.

a. Potential Sources of Hazardous Materials at and Near the Project Site. Several environmental investigations have been performed at the project site since 2007, including Phase I Environmental Site Assessments (ESAs) and investigations involving soil, groundwater, and soil vapor sampling and analysis. The findings from these investigations regarding potential sources of hazardous materials at and near the project site are discussed below. In addition to the findings from previous environmental investigation, a site-specific Geotechnical Exploration¹ found that there is up to 5 feet of undocumented fill consisting of clayey, sandy and gravelly soils mixed with debris on the project site. It is common for fill material historically placed along the margins of San Francisco Bay to include construction debris and rubble in the fill. The source and quality of the existing fill material is not known; therefore, it is possible that these fill materials could be impacted with hazardous materials.

An Updated Phase I ESA² was prepared for the project site in 2016 which summarized findings from previous Phase I ESAs performed for the project site in 2007 and 2012. The Updated Phase I ESA identified historic uses of the project site and vicinity related to hazardous materials as described below.

The southern portion of the project site was used as a leather tannery (known as Frank's Tannery) from approximately 1890 to 1960. Tannery practices in the mid-1900s involved the use of caustic products and materials containing heavy metals that have the potential to impact soil and groundwater.

Leaded fuels were in use up to the mid-1970s, and there is the potential for shallow soil impacts from aerially deposited lead (ADL) in unpaved areas. A portion of the project site adjacent to Highway 101 was unpaved prior to 1974, and therefore, this area could be affected by ADL.

¹ ENGEO, 2017. *Geotechnical Exploration, 1548 Maple Street, Redwood City, California*. February 7.

² Langan Treadwell Rollo, 2016a. *Updated Phase I Environmental Site Assessment, Docktown Marina, 1548 Maple Street, Redwood City, California*. September 26.

The project site had been used for boat and vehicle storage since the early 1960s and had consistently been used for vehicle and boat repair since the 1980s. Although a majority of the property is paved, there is the potential for shallow soil impacts from hazardous materials releases during maintenance of the vehicles and boats. Two fuel underground storage tanks (USTs) were abandoned in-place near the existing boat-ramp in the mid-1970s; a fuel dispenser and vent tubes remain. Although the UST case was considered closed by the San Mateo County Environmental Health Department (SMCEHD), complete documentation on the closure of the USTs was not available.

The Updated Phase I ESA³ also summarized the findings of a 2008 Phase II ESA,⁴ which concluded that shallow soil in the areas of the former vehicle maintenance and repair facilities and the former USTs had been impacted by petroleum hydrocarbons; and that if excavation were to occur at the project site, the abandoned USTs should be removed.

In 2010, the California Environmental Protection Agency (CalEPA) Department of Toxic Substances Control (DTSC) performed a Site Screening⁵ for the Former Frank's Tannery Site which historically occupied the southern portion of the project site. The Site Screening included a review of historic aerial photos and Sanborn Fire Insurance Maps, and excerpts from the 2008 Phase II ESA. DTSC concluded that natural bark⁶ was used in the tanning process, and that laboratory analytical results for soil and groundwater samples analyzed for metals, volatile organic compounds (VOCs), semi-volatile organic compounds, and dioxins were below residential screening levels or within background levels, and recommended no further action for the site.

In 2011, sampling of soil, groundwater, and soil vapor was performed at the project site as documented in a Data Submittal.⁷ The information presented in the Data Submittal and in the 2008 Phase II ESA was summarized and evaluated in a 2012 Memorandum,⁸ which concluded the following:

- Although detected concentrations of total petroleum hydrocarbon (TPH) compounds in soil exceeded the San Francisco Bay Regional Water Quality Control Board's (Regional Water Board's) Environmental Screening Levels (ESLs) for residential land use at two locations, the representative concentrations calculated as the 95 percent upper confidence limits (UCLs) of the arithmetic means for the concentrations of TPH compounds were below residential ESLs.
- Although residential ESLs were exceeded in one of the soil samples analyzed for volatile organic compounds (VOCs), it does not appear that the project site has been significantly impacted by VOCs.

³ Ibid.

⁴ A copy of the 2008 Phase II ESA Report was not available for review.

⁵ California Department of Toxic Substances Control, 2010. Site Screening Form, Former Frank's Tannery, June 29.

⁶ Natural bark tanning uses fewer toxic chemicals than chemical tanning processes.

⁷ WEST, 2011. Data Submittal, 1548 Maple Street, April.

⁸ EKI, 2012. Memorandum, Evaluation of PAHs and other Chemicals of Concern in Soil for the Property Located at 1548 Maple Street in Redwood City, California. April 30.

- Although the detected concentrations of several metals in soil exceeded residential ESLs and DTSC's California Human Health Screening Level (CHHSL) for lead, the representative concentrations calculated for all metals were below ESLs with the exception of mercury and vanadium, which were above ESLs but below CHHSLs, and arsenic, which was above the ESL and CHHSL but within typical background concentrations.
- Polycyclic aromatic hydrocarbons (PAHs) were detected in some soil samples at concentrations above ESLs; however, remedial action at the project site was not deemed necessary because the detected PAH concentrations in soil were within the range of ambient concentrations found in urban areas of northern California.

In 2012, the Regional Water Board issued a No Further Action letter⁹ for the project site which confirmed the completion of investigations for the project site and indicated that the Regional Water Board concurred with the conclusions of the 2012 Memorandum, and that no further action related to the pollutant releases at the project site was required, with the provision that the information provided to the Regional Water Board was accurate and representative of site conditions.

Based on information presented in the previous investigation reports discussed above, the Updated Phase I ESA¹⁰ included the following conclusions:

- Review of previous environmental investigations revealed concentrations of vinyl chloride in soil gas above the current (February 2016) residential ESL for Subslab/Soil Gas Vapor Intrusion.
- Review of previous environmental investigations revealed two isolated areas with lead concentrations in soil above the current (February 2016) residential ESL for Shallow Soil Exposure.
- Releases of petroleum hydrocarbons are commonly associated with USTs; however, previous sampling results indicate that petroleum hydrocarbon related compound concentrations in the area of the abandoned USTs were not detected in groundwater, and were below residential ESLs for soil gas and soil.
- Given the age of the buildings currently on the property, asbestos containing building materials (ACM) and lead-based paint may have been used in construction. Identification and abatement of ACM and lead-based paint may be needed prior to building demolition.

In September 2016, additional soil and soil vapor sampling was performed at the project site as documented in a 2016 Technical Memorandum.¹¹ The 2016 Technical Memorandum indicated that the additional sampling was performed to verify previous VOC concentrations in soil vapor found at one location during the 2011 sampling event (the locations for future residential structures were also taken into consideration when positioning the soil vapor sampling locations) and soil sampling was

⁹ San Francisco Bay Regional Water Quality Control Board, 2012. No Further Action - Docktown Marina (a.k.a. Former Frank's Tannery) Site at 1548 Maple Street, Redwood City, San Mateo County, California, 12 October.

¹⁰ Langan Treadwell Rollo, 2016a, op. cit.

¹¹ Langan Treadwell Rollo, 2016b. *Technical Memorandum, Additional Phase II Sampling, Docktown Marina, 1548 Maple Street, Redwood City, CA.* October 4.

also conducted near the abandoned USTs to verify the findings of the 2008 Phase II ESA. Based on the additional sampling results, the 2016 Technical Memorandum concluded the following:

- Benzene, chlorobenzene and ethylbenzene are present in soil vapor in the central portion of the project site at concentrations that may require vapor mitigation, and elevated analytical reporting limits for other VOCs make it impossible to verify whether they are present above the Residential Subslab/Soil Gas Vapor Intrusion ESLs.
- Soil vapor sampling will be needed during the project design phase to verify soil vapor mitigation requirements.
- The methane concentrations present in soil vapor appear to be associated with bayshore marshlands and are not under pressure that would drive upward migration; however, the elevated levels may require mitigation.
- Soil sampling results from the vicinity of the abandoned USTs confirmed that residual TPH concentrations were still below residential ESLs and have continued to degrade over time, and concentration of benzene, toluene, ethylbenzene and xylenes (BTEX) were not detected above the laboratory reporting limits.

In December 2016, the applicant submitted a Request for Agency Oversight¹² to the Regional Water Board and DTSC, and in January 2017, the Regional Water Board issued a Site Cleanup Program (SCP) cost recovery letter¹³ indicating that the Regional Water Board will be actively overseeing the investigation and cleanup of the project site.

A Sampling and Analysis Plan (SAP)¹⁴ was prepared for the project site in August 2017. The SAP proposed sampling and analysis of soil and soil vapor to further evaluate the extent of impacts from lead in soil and VOCs in soil vapor that had been detected at the project site during previous investigations. The SAP included a risk evaluation to assess potential health risks associated with exposure to contaminants previously detected at the project site, assuming a future residential land use scenario. The risk evaluation found that the incremental lifetime cancer risk (ILCR) of 3E-04 posed to a hypothetical resident exceeds the upper bound of the EPA's risk management range of 1E-04 (1 in 10,000), and the non-cancer hazard index (HI) of 3.4 exceeds the acceptable HI of 1. Based on the findings of the risk assessment and available data, vapor mitigation was recommended for the project site. The findings from the SAP will be used to delineate soil excavation volumes and further evaluate vapor intrusion risks to determine whether vapor mitigation measures would be necessary following the placement of fill material on the project site.¹⁵ In a September 2017 letter,¹⁶ the Regional Water Board approved the SAP and requested the submittal of a Response Plan which would include the findings from implementation of the SAP.

¹² 1548 Maple Street, LLC, 2016. Request for Agency Oversight Application. December 2.

¹³ San Francisco Bay Regional Water Quality Control Board, 2017a. Site Cleanup Program (SCP) recovery of oversight costs at the 1548 Maple Street, Redwood City, San Mateo County. January 9.

¹⁴ Langan, 2017a. *Sampling and Analysis Plan for Soil and Soil Vapor Sampling, 1548 Maple Street Development, Redwood City, California*. August 22.

¹⁵ Ibid.

¹⁶ San Francisco Bay Regional Water Quality Control Board, 2017b. *Approval of Sampling and Analysis Plan, 1548 Maple Street, Redwood City, San Mateo County*. September 8.

Additional investigation activities were performed at the project site in September and November 2017 and documented in a Response Plan prepared for the project site.¹⁷ The investigations included sampling of soil, soil gas, and groundwater to further evaluate the extent of impacts from lead, TPH compounds, and VOCs in the subsurface of the project site. Concentrations of lead, TPH as diesel, and chlorobenzene (a VOC) were detected in soil samples at concentrations exceeding applicable ESLs. Concentrations of several VOCs were detected in groundwater and soil gas samples at concentrations exceeding applicable ESLs.¹⁸ The Response Plan includes a comparison of investigation results and subsurface conditions of the project site to the State Water Resources Control Board's (State Water Board's) Low-Threat Underground Storage Tank Case Closure Policy (LTCP),¹⁹ which provides case closure criteria for low-threat petroleum UST sites. The VOC contamination identified at the project site has not been attributed to a leaking UST; however, the LTCP criteria for closure evaluation may be applied to non-UST sites that exhibit attributes similar to UST sites.²⁰ The LTCP case closure criteria is based on the natural breakdown and attenuation of petroleum fuels and associated petroleum compounds in a subsurface environment where specific bioattenuation zone²¹ characteristics are present. The general criteria for sites to be considered for LTCP case closure include that the secondary source (impacted soil or groundwater located at or immediately beneath the point of release from the primary source) has been removed to the extent practicable.²² As discussed below, the contaminant source area has not been identified at the project site, and the Response Plan does not include further investigation or removal of the secondary source; therefore, comparison of investigation results to the LTCP case closure criteria may not be appropriate for the project site.

A former engine repair facility was located in the central portion of the project site,²³ and the highest concentrations of VOCs in soil vapor and groundwater have been detected in the areas surrounding the former engine repair facility. Review of historic aerial imagery available on Google Earth indicates that the former engine repair facility could be a contaminant source area, as staining can be seen on the ground surface in the vicinity of the former engine repair facility in several aerial images dated between 2007 and 2013,²⁴ and there are unpaved areas in the vicinity of the former engine repair facility where any potential releases of hazardous material could have infiltrated the subsurface. In September 2017, the issue of identifying the source area of VOCs contamination was discussed with the Regional Water Board's case worker for the project site. The case worker agreed

¹⁷ Langan Engineering and Environmental Services, Inc., 2017b. *Response Plan, 1548 Maple Street Development, Redwood City, California*. December 8.

¹⁸ Ibid.

¹⁹ State Water Board, 2012. Low-Threat Underground Storage Tank Case Closure Policy. Available online at: www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2012/rs2012_0016atta.pdf (accessed December 11, 2017). Adopted May 1.

²⁰ Ibid.

²¹ The bioattenuation zone is defined as a continuous zone of soil between a soil vapor sample or the top of groundwater and the bottom of an existing or proposed building.

²² State Water Board, 2012, op. cit.

²³ Langan Engineering and Environmental Services, Inc., 2017b, op. cit.

²⁴ Google Earth, 2017. Aerial images dated July 2007, September 2009, May 2011, and June 2013 (accessed September 21).

that the former engine repair facility could be a source area of VOCs contamination, and that additional sampling to evaluate the potential source area could be required by the Regional Water Board as part of the Response Plan.²⁵ Although the investigations performed in September and November 2017 included sampling in areas surrounding the former engine repair facility, sampling was not performed within the area of the former engine repair facility or the adjacent unpaved areas, and the former engine repair facility was not identified as a potential source area in the Response Plan.

The Response Plan includes a screening level human health risk evaluation that was performed to assess contaminants found in soil, groundwater, and soil gas of the project site. Because benzene and ethylbenzene soil gas concentrations were below the LTCP soil gas criteria in the presence of a bioattenuation zone, benzene and ethylbenzene were not considered to be constituents of concern and were not evaluated in the human health risk evaluation. The concentration of other VOCs detected in soil gas were included in the human health risk evaluation, and incremental lifetime cancer risk (ILCR) and non-cancer hazard index (HI) estimates were derived for each sample location. The ILCR estimates were compared to a cumulative risk threshold value of 1E-05 commonly applied by the Regional Water Board to determine the need for mitigation at each location. Several sample locations exceeded the cumulative risk threshold due to the contribution of vinyl chloride and 1,4-dichlorobenzene to total risk. The non-cancer hazard index (HI) for several sampling locations exceeds the acceptable HI of 1.0. The HI exceedances were almost entirely attributable to chlorobenzene at each location. Given the exceedance of the ILCR target risk value and effects based thresholds at several locations, vapor mitigation or remedial action was recommended at these locations.²⁶

Based on the findings of investigation activities and the risk evaluation, the following Response Plan objectives were developed:²⁷

- Protect human health by eliminating potentially complete pathways for inhalation of soil gas impacted by VOCs;
- Remove lead-impacted soil in isolated areas to concentrations below the 2016 Residential Direct Exposure ESL of 80 milligrams per kilogram (mg/kg); and
- Remove soil impacted by total TPH greater than 100 mg/kg as required by the LTCP.

Remedial activities proposed in the Response Plan to achieve the objectives above are discussed under the project impacts discussion of this section.

b. Regulatory Framework. The use, storage, and disposal of hazardous materials – including management of contaminated soils and groundwater – is regulated by numerous local, State, and federal laws and regulations. Federal, State, and regional agency’s jurisdiction in the management of hazards and hazardous materials, as applicable to the proposed project, is described below.

²⁵ Archer, Kelly, 2017. Caseworker, Regional Water Quality Board. Personal communication with Cem Atabek of BASELINE Environmental Consulting. September 21.

²⁶ Langan Engineering and Environmental Services, Inc., 2017b, op. cit.

²⁷ Ibid.

(1) Federal. At the federal level, the United States Environmental Protection Agency (EPA) administers hazardous materials and hazardous waste regulations, the Occupational Safety and Health Administration (OSHA) regulates worker safety related to hazardous materials handling, and the United States Department of Transportation (DOT) regulates hazardous waste transportation.

United States Environmental Protection Agency. The EPA is the agency responsible for enforcement and implementation of federal laws and regulations pertaining to hazardous materials and hazardous waste. The federal regulations are primarily codified in Title 40 of the Code of Federal Regulations. The legislation includes the Resource Conservation and Recovery Act of 1976 (RCRA); the Superfund Amendments and Reauthorization Acts of 1986; and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980. The EPA provides oversight for site investigation and remediation projects, and has developed protocols for sampling, testing, and evaluation of solid wastes.²⁸

Occupational Safety and Health Administration. Worker health and safety is regulated at the federal level by OSHA. The federal Occupational Safety and Health Act of 1970 authorizes the states to establish their own safety and health programs with OSHA approval. Worker health and safety protections in California are regulated by the California Occupational Safety and Health Administration (Cal/OSHA), as described below. California standards for workers dealing with hazardous materials are contained in 8 CCR; they include practices for all industries (General Industrial Safety Orders), as well as specific practices for construction. Workers at hazardous waste sites (or workers who may be exposed to hazardous wastes that might be encountered during excavation of contaminated soils) must receive specialized training and medical supervision according to OSHA Hazardous Waste Operations and Emergency Response regulations. Additional regulations have been developed for construction workers potentially exposed to lead and asbestos. Cal/OSHA enforcement units conduct on-site evaluations and issue notices of violation to enforce necessary improvements to health and safety practices.

Department of Transportation. In 1990 and 1994, the federal Hazardous Material Transportation Act was amended to improve the protection of life, property, and the environment from the inherent risks of transporting hazardous material in all major modes of commerce. The DOT developed hazardous materials regulations, which govern the classification, packaging, communication, transportation, and handling of hazardous materials, as well as employee training and incident reporting. The transportation of hazardous materials is subject to both RCRA and DOT regulations. The California Highway Patrol, Caltrans, and the DTSC are responsible for enforcing federal and State regulations pertaining to the transportation of hazardous materials.

(2) State Agencies. At the State level, the CalEPA, which includes DTSC and the State Water Board (which operates via nine Regional Water Quality Control Boards [Regional Water Boards]) administers hazardous materials and hazardous waste regulations, the California Air Resources Board (CARB) regulates air pollution control programs, and Cal/OSHA regulates worker safety related to hazardous materials handling.

²⁸ U.S. Environmental Protection Agency, 2017. *Hazardous Waste Test Methods/ SW-846*, updated December 1, 2017. Website: www.epa.gov/hw-sw846 (accessed December 11, 2017).

Department of Toxic Substances Control. In California, the DTSC is authorized by the EPA to enforce and implement federal hazardous materials laws and regulations. California regulations pertaining to hazardous materials are equal to or exceed the federal regulation requirements. Most State hazardous materials regulations are contained in Title 22 of the California Code of Regulations (CCR). The DTSC generally acts as the lead agency for soil and groundwater cleanup projects that affect public health, and establishes cleanup levels for subsurface contamination that are equal to or more restrictive than federal levels. The DTSC has also developed land disposal restrictions and treatment standards for hazardous waste disposal in California.

State Water Resources Control Board. The State Water Board enforces regulations on implementation of UST programs. It also allocates funding to eligible parties that request reimbursement of costs to clean up soil and groundwater pollution from UST leaks. The State Water Board also enforces the Porter-Cologne Water Quality Act through its nine Regional Water Boards, including the Regional Water Board, described below.

California Air Resources Board. This agency is responsible for coordination and oversight of State and local air pollution control programs in California, including implementation of the California Clean Air Act of 1988. CARB has developed State air quality standards, and is responsible for monitoring air quality in conjunction with the local air districts.

California Occupational Safety and Health Administration. Worker health and safety protections in California are regulated by Cal/OSHA. California standards for workers dealing with hazardous materials are contained in California Code of Regulations (CCR) Title 8; they include practices for all industries (General Industrial Safety Orders), as well as specific practices for construction. Workers at hazardous waste sites (or workers who may be exposed to hazardous wastes that might be encountered during excavation of contaminated soils) must receive specialized training and medical supervision according to OSHA Hazardous Waste Operations and Emergency Response regulations. Additional regulations have been developed for construction workers potentially exposed to lead and asbestos. Cal/OSHA enforcement units conduct on-site evaluations and issue notices of violation to enforce necessary improvements to health and safety practices.

(3) Regional and Local Agencies. The following regional and local agencies have regulatory authority over the proposed project's management of hazardous materials and hazards.

San Francisco Bay Regional Water Quality Control Board. The nine Regional Water Boards provide for the protection of Waters of the State in accordance with the Porter-Cologne Water Quality Act of 1969. The Regional Water Board can act as lead agency to provide oversight of sites in Region 2 where the quality of groundwater or surface waters is threatened. It has the authority to require investigations and remedial actions. The Regional Water Board has developed Environmental Screening Levels (ESLs) to help expedite the preparation of environmental risk assessments at sites where contaminated soil and groundwater have been identified. The Regional Water Board is currently the lead agency providing oversight of environmental investigation and cleanup activities for the project site.

Bay Area Air Quality Management District. The Bay Area Air Quality Management District (BAAQMD) has primary responsibility for control of air pollution from sources other than motor vehicles and consumer products (which are the responsibility of the EPA and CARB). BAAQMD is

responsible for preparing attainment plans for non-attainment criteria pollutants, control of stationary air pollutant sources, and the issuance of permits for activities including asbestos demolition and renovation activities (District Regulation 11, Rule 2).

San Mateo County Environmental Health Department. The SMCEHD is the primary agency responsible for local enforcement of State and federal laws pertaining to hazardous materials management. It has jurisdiction in Redwood City. SMCEHD is a Certified Unified Program Agency; it is responsible for the Hazardous Materials Business Plan Program; the local hazardous waste generator program; UST management; investigation of leaking USTs; oversight of remediation of contaminated sites; and the California Accidental Release Program for highly toxic, flammable, or explosive materials. SMCEHD also administers a County Household Hazardous Waste Program to educate the public about the dangers of toxic household wastes and to provide for proper disposal of household hazardous wastes.

City/County Association of Governments of San Mateo County Airport Land Use Committee. Land uses near the San Carlos Airport, the nearest airport to the site, are regulated by the City/County Association of Governments (C/CAG) of San Mateo County Airport Land Use Committee (ALUC). The ALUC maintains and implements the Comprehensive Airport Land Use Plan (CLUP) for San Carlos Airport.²⁹ The CLUP is intended to prevent development that is incompatible with airport operations and include specific regulations, such as height restrictions based on proximity to the airport and flight patterns.

Redwood City General Plan. The Safety Element of the Redwood City General Plan contains the following goals, policies, and programs related to hazardous materials, fire, and emergency preparedness.

Goal PS-8: Protect city residents, and businesses and employees from potential hazards associated with the use, storage, transport, and disposal of hazardous materials in and through Redwood City.

- Policy PS-8.1: Establish policies to regulate and reduce hazardous waste within Redwood City that are consistent with the County's Hazardous Waste Management Plan and other County regulatory programs.
- Policy PS-8.3: Work to ensure that land previously used as agriculture, commercial, and industrial is safe and contains no environmental hazards.
- Policy PS-8.4: Encourage the use of green building practices to reduce potentially hazardous materials in construction materials.

Goal PS-10: Minimize risks of potential hazards in the vicinity of San Carlos Airport.

- Policy PS-10.1: Work to achieve consistency between General Plan land use and related policies and the San Carlos Airport Comprehensive Land Use Plan, as is appropriate for

²⁹ ESA, 2015. *Final Comprehensive Airport Land Use Compatibility Plan for the Environs of San Carlos Airport*. October. Available at: ccag.ca.gov/wp-content/uploads/2015/11/SQL_FinalALUCP_Oct15_read.pdf (accessed October 10, 2017).

Redwood City. Measures may include restrictions on permitted land uses and development criteria, including height restrictions.

- Program PS-31: Hazardous Materials Buffer. Require a buffer zone between areas where significant quantities of hazardous materials are present and sensitive receptors, such as residences, hospitals and nursing/convalescent homes, hotels and lodging, schools, and day care centers.
- Program PS-33: Emergency Vehicle Access and Secure Evacuation Routes. Require new development to provide adequate access for emergency vehicles, particularly fire-fighting equipment, as well as secure evacuation routes for inhabitants.
- Program PS-35: Emergency Response Preparedness Programs. Maintain and update, as appropriate, the City's emergency response preparedness programs, plans, and procedures to protect the health and safety of the community, and to provide effective and quick recovery of affected areas in the event of a major disaster. In particular, incorporate into such plans and programs strategies to provide continuous access to and from the Police Station via the Redwood Creek undercrossing of US 101.
- Program PS-37: County Airport Land Use Plan. Refer all General Plan and Zoning Map amendments/updates, Precise Plans, and other amendments affecting property within Area B of the Airport Influence Area (AIA) Boundary for San Carlos Airport to the C/CAG ALUC for a determination of consistency with the CLUP for the environs of San Carlos Airport.
- Program PS-48: Hazardous Material Releases from Prior Land Uses. Establish development standards for new development and redevelopment in areas previously used for commercial, agricultural, or industrial uses to identify and abate hazardous material releases from prior land uses that have the potential to affect future property owners or users. A Phase I Environmental Site Assessment should be required where appropriate and environmental testing and/or remediation may be required based on the findings of the Phase I.
- Program PS-55: County Environmental Health Department Consultation. Consult with the County Environmental Health Department to regularly inspect businesses for compliance with their Hazardous Materials Management Plans.

2. Impacts and Mitigation Measures

This section discusses potential impacts to public health that could result from implementation of the proposed project. The section begins with the criteria of significance, which establish the thresholds used to determine whether an impact is significant. The latter part of this section presents the impacts associated with the proposed project and identifies mitigation measures, as appropriate. As previously noted, potential impacts associated with implementation of both the proposed project and the project variant are not differentiated in this section, where applicable.

a. Criteria of Significance. A significant hazardous material or public health and safety impact would occur if the proposed project would:

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

- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;
- Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 (i.e., the “Cortese List”) and, as a result, would create a significant hazard to the public or the environment; or
- Fundamentally impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

b. Project Impacts. The following section describes the potential impacts of the project related to hazards and hazardous materials. Potential impacts are differentiated between the construction and operation phases of the project, where applicable. Impacts are also evaluated for both the proposed project and the project variant, where applicable.

(1) Routine Transport, Use, or Disposal of Hazardous Materials. Potential operation and construction period impacts associated with the routine transport, use, or disposal of hazardous materials are discussed below.

Operation. The proposed residential and open space land uses of the project would involve the use of only small quantities of commercially-available hazardous materials (e.g., paint, cleaning supplies, fertilizers), and therefore operation of the proposed project would result in less-than-significant impacts related to routine transport, use, or disposal of hazardous materials.

Construction. Hazardous material such as oils, fuels, paints, solvents, and adhesives would be transported and used at the project site for proposed construction activities. Use of hazardous materials during construction may pose health and safety hazards to construction workers if the materials are improperly handled, or to nearby residents and the environment surrounding the proposed project if the hazardous materials are accidentally released into the environment. Potential impacts associated with accidental releases of hazardous materials into the environment are discussed in the subsection below.

The routine handling and use of hazardous materials by construction workers would be performed in accordance with OSHA regulations, which include training requirements for construction workers and a requirement that hazardous materials are accompanied by manufacturer’s Safety Data Sheets (SDSs). Cal/OSHA regulations include requirements for protective clothing, training, and limits on exposure to hazardous materials. Compliance with these existing regulations would ensure that construction workers are protected from exposure to hazardous materials that may be used on site.

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

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

Compliance with existing regulations described above would ensure that potential impacts from the routine transport, use, or disposal of hazardous materials during construction of the proposed project and the project variant would be less than significant.

(2) Accidental Release of Hazardous Materials. Potential operation and construction period impacts associated with the potential accidental release of hazardous materials are discussed below.

Operation. Operation of the proposed would involve the use of only small quantities of commercially-available hazardous materials (e.g., paint, cleaning supplies, fertilizers), and therefore operation of the proposed project would not result in accidental releases of hazardous materials that could create a significant hazard to the public or the environment.

Construction. An accidental release of hazardous materials (e.g., oils, fuels, solvents, or paints) during project construction could result in exposure of construction workers, the public, and/or the environment to hazardous materials. As discussed above, the proposed project would be subject to the requirements of the Construction General Permit, which requires preparation and implementation of a SWPPP to reduce the risk of spills or leaks from reaching the environment, including procedures to address minor spills of hazardous materials. Measures to control spills, leakage, and dumping must be addressed through structural as well as nonstructural best management practices (BMPs), as required by the Construction General Permit. For example, equipment and materials for cleanup of spills must be available on site, and spills and leaks must be cleaned up immediately and disposed of properly. BMPs also include treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

As discussed above, the transportation of hazardous materials is subject to both RCRA and DOT regulations. If a discharge or spill of hazardous materials occurs during transportation, the transporter is required to take appropriate immediate action to protect human health and the environment (e.g., notify local authorities and contain the spill), and is responsible for the discharge cleanup.

As previously discussed, fill materials impacted with hazardous materials could be present on the project site, and the project site is known to be impacted by releases of hazardous materials which have resulted in impacts from lead in soil and VOCs in soil, groundwater and soil gas. In addition, large volumes of soil will be used at the project site for the purpose of surcharging the site and raising the elevation of the project site. Disturbance and reuse of soil potentially impacted with hazardous materials during construction could result in exposure of construction workers, the public, and/or the environment to hazardous materials.

Impact HAZ-1: Construction of the proposed project and the project variant could result in accidental releases of hazardous materials and/or the disturbance and reuse of soil potentially impacted with hazardous materials that could result in impacts to construction workers, the public, and/or the environment. (S)

In addition to compliance with the regulations discussed above, implementation of the following mitigation measure would ensure that potential impacts from an accidental release of hazardous materials or disturbance/re-use of soil impacted with hazardous materials would be less than significant.

Mitigation Measure HAZ-1: A Construction Risk Management Plan (CRMP) shall be prepared by a qualified environmental professional to protect construction workers, the public, and the environment from hazardous materials, including potential unknown contamination in the subsurface of the project site. The CRMP shall be submitted to and approved by the Regional Water Board prior to the start of construction activities, and shall include, but not be limited to, the following:

1. Procedures for evaluating, handling, storing, testing and disposing of soil and groundwater generated during project excavation and grading activities. Materials generated from excavation and grading activities on the project site shall be tested for potential contaminants prior to re-use as engineered fill on-site.
2. A project-specific Health and Safety Plan that identifies hazardous materials to be used at the project site (e.g., oils, fuels, paints, solvents, and adhesives) and hazardous materials identified in soil, groundwater, and soil vapor through sampling; describes required health and safety provisions and training for all workers potentially exposed to hazardous materials in accordance with State and federal worker safety regulations; and designates the personnel responsible for Health and Safety Plan implementation.
3. A contingency plan that shall be implemented if previously unidentified potentially contaminated material or regulated features (e.g., USTs) are encountered during construction activities. The contingency plan shall include provisions that require notification of the City, Regional Water Board, or any other regulatory agencies with jurisdiction, when potentially contaminated material is encountered. Physical signs of potentially contaminated materials include staining/discoloration, oily sheen or free phase products, odors, the presence of rubble/debris/refuse, or the presence of buried features that may contain hazardous materials (e.g., drums, buckets, sumps, vaults, or pipelines). The contingency plan shall include guidelines for the collection of soil and/or groundwater samples by a qualified environmental professional prior to further work in the newly discovered affected area. The samples shall be submitted for laboratory analysis by a State-certified laboratory under chain-of-custody procedures. The analytical methods shall be selected by the environmental professional. The analytical results of the sampling shall be reviewed by the qualified environmental professional and submitted to the appropriate regulatory agency, if appropriate. The environmental professional shall provide recommendations, as applicable, regarding soil/waste management, worker health and safety training, and regulatory agency notifications, in accordance with local, State, and federal requirements. Work shall not resume in the area(s) affected until these recommendations have been implemented under oversight by the City, Regional Water Board, or any other regulatory agencies with jurisdiction, as appropriate.

4. Designated personnel responsible for implementation of the CRMP.

In addition, the following measures shall be implemented:

- The contractor(s) shall designate storage areas suitable for hazardous materials delivery, storage, and waste collection prior to any construction activities. These locations must be as far away from catch basins, gutters, drainage courses, and water bodies as possible. All hazardous materials and wastes used or generated during project site development activities shall be labeled and stored in accordance with applicable local, State, and federal regulations. In addition, an accurate up-to-date inventory, including SDSs, shall be maintained on site to assist emergency response personnel in the event of a hazardous materials incident.
- All maintenance and fueling of vehicles and equipment shall be performed in a designated, bermed area, or over a drip pan that will not allow runoff of spills. Vehicles and equipment shall be regularly checked and leaks repaired promptly at an off-site location. Secondary containment shall be used to catch leaks or spills any time vehicle or equipment fluids are dispensed, changed, or poured.
- An Emergency Preparedness and Response Plan shall be developed by the contractor(s) for emergency notification in the event of an accidental spill or other hazardous materials emergency during project site preparation and development activities. These procedures shall include evacuation procedures, spill containment procedures, and required personal protective equipment, as appropriate, in responding to the emergency. The contractor(s) shall submit these procedures to the City prior to demolition or development activities.
- If the presence of previously unidentified subsurface hazardous materials is confirmed at the project site, site remediation may be required by the applicable State or local regulatory agencies. Specific remedies would depend on the extent and magnitude of contamination and requirements of the regulatory agency(ies). Under the direction of the regulatory agency(ies) and the City, a Site Remediation Plan shall be developed, if necessary. The Site Remediation Plan shall (1) specify measures to be taken to protect workers and the public from exposure to the potential hazards; and (2) certify that the proposed remediation would protect the public health in accordance with local, State, and federal requirements, considering the land use proposed. Excavation and earthwork activities associated with the proposed project shall not proceed until the Site Remediation Plan has been reviewed and approved by the regulatory oversight agency and is on file with the City.
- Engineering fill and material to be used for surcharging of the project site shall be tested prior to being imported to the project site or prior to re-use of existing material excavated from the project site to ensure that it would not pose an unacceptable risk to human health or the environment. Threshold criteria for acceptance of engineered fill and surcharging material shall be selected based on screening levels and protocols developed by regulatory agencies for protection of human health and leaching to groundwater (e.g., ESLs). The engineered fill and surcharging materials shall be characterized by representative sampling in accordance with the EPA's SW-846 Test Methods and in accordance with the DTSC's Information Advisory for Clean Imported Fill Material (2001 or most recent version). Fill testing shall be performed by a qualified environmental professional and demonstrated to meet the appropriate threshold criteria. The results of the testing shall be submitted to the City and Regional Water Board for review and approval prior to importing of fill material

and surcharging materials to the project site or re-use of material generated from the project site.

- The contractor shall prepare a Waste Disposal and Hazardous Materials Transportation Plan, which shall be submitted to the City prior to any demolition and construction activities. This plan shall describe the analytical methods for characterizing wastes and the handling methods required to minimize the potential for exposure, and shall establish procedures for the safe storage of contaminated materials and stockpiling of soils. The required disposal method for contaminated materials, the approved disposal site, and specific routes used for transport of wastes to and from the project site shall be indicated.
- Hazardous materials and wastes generated during demolition, grading, and trenching activities, shall be removed, managed, and disposed of in accordance with applicable regulations. (LTS)

Construction of the proposed project would also involve the demolition of existing structures on the project site which may contain lead-based paint (LBP), ACMs, and polychlorinated biphenyls (PCBs) containing materials and equipment. If these hazardous building materials were not appropriately abated and disposed of, demolition of the existing structures on the project site could result in the release of these hazardous building materials into the environment and exposure of construction workers and the public.

Impact HAZ-2: Construction of the proposed project and the project variant could result in accidental releases of hazardous building materials that could result in impacts to construction workers, the public, and/or the environment. (S)

Mitigation Measure HAZ-2: Prior to demolition activities, a Hazardous Building Materials Survey (HBMS) shall be performed by an appropriately certified environmental professional which shall identify whether ACMs, PCBs, LBP, or other hazardous materials are present in the existing structures on the project site. Specification for the abatement and disposal of identified hazardous materials in accordance with applicable regulations shall be prepared by an appropriately certified environmental professional. The HBMS and abatement specifications shall be submitted to and approved by the City prior to the start of abatement activities. Abatement activities shall be performed by appropriately certified personnel in accordance with all applicable laws and regulations and documented in a Closeout Report prepared by an environmental professional who shall oversee the abatement activities. The Closeout Report shall be submitted to the City for review and approval prior to the issuance of a demolition permit. (LTS)

Compliance with existing regulations and implementation of Mitigation Measures HAZ-1 and HAZ-2 would ensure that impacts associated with potential accidental releases of hazardous materials would be less than significant.

(3) Hazardous Materials within a Quarter Mile of Schools. There are no schools located within a quarter mile of the project site.³⁰ Therefore, the proposed project would not result in impacts associated with handling or emissions of hazardous materials within a quarter mile of a school.

(4) Hazardous Materials Sites Listed Pursuant to Government Code Section 65962.5. The project site is listed as a Leaking UST cleanup site on the State Water Board's GeoTracker online database, with a "completed – case closed" status as of September 1990.³¹ The project site is also listed as a cleanup site on DTSC's Envirostor online database, with a "no further action" status as of June 2010.³² The project site is therefore included on the list of hazardous materials release sites compiled pursuant Government Code Section 65962.5.

As previously discussed, the project site is known to be impacted by releases of hazardous materials which have resulted in contamination from lead in soil and VOCs in soil, groundwater and soil gas. The Regional Water Board is currently overseeing the environmental investigation and planned remediation activities for the project site.

The project would include implementation of the proposed Response Plan, which proposes excavation of several areas on the project site to depths ranging from 2 to 5.5 feet to remove lead and TPH impacted soil, and backfilling of the excavations with clean imported soil. The Response Plan includes health and safety protocol and soil management procedures to ensure that the handling of contaminated soil would not result in exposure of construction workers, the public, or the environment to hazardous materials. The Response Plan also proposes the collection of confirmation samples to verify that impacted soil has been sufficiently removed. An update of soil vapor risk calculations would also be performed to evaluate the need for vapor mitigation systems (VMS). If required, VMS designs and an Operation and Maintenance (O&M) Plan would be prepared. The Response Plan must be reviewed and approved by the Regional Water Board prior to implementation of the project, and the Regional Water Board would also review the update of soil vapor risk calculations, and if required, the VMS designs and O&M Plan.

The characteristics of fill material that would be placed over the project site to raise its grade may not be known at the time the updated risk evaluation would be performed. The potential health risks associated with soil vapor intrusion could be incorrectly evaluated if inaccurate assumptions are made regarding the characteristics of fill material that would be placed over the site. In addition, the investigation activities performed in September and November 2017 did not identify the source area of VOCs contamination, and the Response Plan does not include further investigation or removal of the secondary source (impacted soil or groundwater located at or immediately beneath the point of release from the primary source). As previously discussed, the former engine repair facility located in the central portion of the project site could be a source area of VOCs contamination.

³⁰ California Department of Education, 2017. California School Directory. Website: www.cde.ca.gov/schooldirectory (accessed September 19).

³¹ State Water Resources Control Board, 2017. GeoTracker, Docktown Marina, 1548 Maple Street, Redwood City, CA. Website: geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0608101082 (accessed September 19).

³² Department of Toxic Substances Control, 2017. Envirostor, Former Frank's Tannery, 1548 Maple Street, Redwood City, CA. Website: www.envirostor.dtsc.ca.gov/public/profile_report.asp?global_id=60001000 (accessed September 19).

If the source area of the VOCs contamination on the project site is not identified prior to construction activities, construction workers and the public could be exposed to VOCs that would be released during demolition (i.e., pavement removal), excavation, or grading activities, and potential health risks associated with soil vapor intrusion could impact future residents of the project site. The construction of new subsurface utilities on the project site could also create preferential pathways for soil vapor to migrate within utility trenches from areas impacted with elevated VOCs to areas beneath nearby structures.

Impact HAZ-3: Construction of the proposed project and the project variant could result in potential health risks associated with exposure to VOCs. (S)

Implementation of Mitigation Measure HAZ-1 would mitigate the potential impacts to human health and the environment that could occur if a source area of VOCs contamination is encountered during construction activities. The Regional Water Board's review of the Response Plan and oversight of implementation of the Response Plan would generally ensure that investigation and remediation activities (including evaluation of health risks associated VOCs and installation of vapor mitigation systems, if necessary) would be performed in a manner that would protect human health and the environment. However, because the assumptions that would be made for updated risk evaluation regarding the characteristics of fill material are unknown, and it is not known whether the VOCs contamination source area would be identified during implementation of the Response Plan, or project construction, or if the Regional Water Board would approve the implementation of the Response Plan and proposed residential land use, the following mitigation measure would ensure that past hazardous materials releases on the project site would result in less than significant impacts to human health.

Mitigation Measure HAZ-3: The project applicant shall revise the Response Plan as follows, and to the satisfaction of the Regional Water Board to ensure that potential health risks associated with exposure to VOCs are below established thresholds:

The updated risk evaluation required to be performed during implementation of the Response Plan shall conservatively assume that fill material placed on the site would be highly permeable (i.e., assume worst case characteristics of the fill related to attenuation of VOCs), or the engineered fill material to be used at the site shall meet specifications developed by the qualified environmental professional that performs the updated risk evaluation to ensure that the engineered fill meets the characteristics assumed for the updated risk evaluation. Alternatively, additional soil vapor sampling shall be performed at the project site following the placement of fill material and subsequent removal of surcharge fill material to re-evaluate soil vapor intrusion risks based on the actual future condition of the project site.

The Response Plan shall include a requirement for field oversight by a qualified environmental professional during demolition activities involving the removal of pavement surfaces near the former engine repair facility and any other locations where elevated concentration of VOCs (exceeding residential ESLs) have been detected in soil vapor in order to visually evaluate potential source areas of VOCs contamination, and additional sampling shall be performed in the vicinity of the former engine repair facility, particularly in the unpaved areas that surround the former engine repair facility, to attempt to identify the contaminant source area. The Response Plan shall include measures (e.g., excavation and off-site disposal of impacted soil)

for remediation of the VOCs contamination source area if it is identified during implementation of the Response Plan. If the VOCs contamination source area is not identified and remediated, soil vapor mitigation systems shall be installed beneath the residential structures that would be located in the vicinity of the former engine repair facility and in the vicinity of any sample locations where VOCs in soil vapor are found to present an unacceptable human health risk (e.g., an ILCR exceeding $1E-06$, or HI exceeding 1, or other health risk threshold as determined by the Regional Water Board).

The project applicant shall provide written approval from the Regional Water Board of the successful implementation of the Response Plan and proposed residential land use to the City prior to issuance of a certificate of occupancy. (LTS)

Implementation of Mitigation Measures HAZ-1 and HAZ-3, and the Regional Water Board's review of the Response Plan and oversight of implementation of the Response Plan would ensure that the proposed project would result in less-than-significant impacts related to past hazardous materials releases which occurred on the project site.

(5) Emergency Evacuation Routes. The proposed project would alter the existing street network in the vicinity of the project site by extending Blomquist Street towards the northwest, where it would intersect with the northwestern end of Maple Street and provide the primary access to the project site. Secondary access to the project site would also still be available via reconstructed Maple Street. The proposed project would also maintain a 20-foot-wide corridor along the proposed segment of Bay Trail for emergency access to the Docktown Marina, until such time emergency access is no longer needed to the Docktown Marina. Under the project variant, Blomquist Street would be extended further towards the northwest adjacent to Highway 101 and the southern boundary of the project site, and would provide a third access point to the southwest portion of the project site and the temporary emergency access corridor to the Docktown Marina.

Potential emergency evacuation routes away from the project site include Maple Street and Blomquist Street. As discussed above, the proposed project would maintain emergency access to the Docktown Marina and would increase the accessibility of the project site by extending Blomquist Street towards the northwest. Therefore, the proposed project would result in less-than-significant impacts related to impairing or interfering with emergency evacuation or response.

c. Cumulative Impacts. As discussed above, accidents involving hazardous materials releases or soil disturbance that may be impacted with hazardous materials during construction activities could result in adverse effects to construction workers, the public, or the environment. Occurrence of a cumulative effect would require that multiple projects released hazardous materials at the same time in close proximity to each other. Compliance with existing regulations and implementation of Mitigation Measures HAZ-1, HAZ-2, and HAZ-3 would ensure that potential construction period impacts associated with releases of hazardous materials or soil disturbances that may be impacted with hazardous materials are less than significant. Each site, including the proposed project, would be required to comply with existing hazardous materials regulations to reduce the risk of impacts associated with hazardous materials releases. Therefore, the potential for impacts associated with hazardous materials releases from the proposed project to combine with impacts associated with hazardous materials releases from other sites is not cumulatively considerable.

H. HYDROLOGY AND WATER QUALITY

This section describes the hydrologic environment of the proposed project, including runoff, drainage, and water quality characteristics, based on a site-specific Engineering Report,¹ a site-specific Geotechnical Exploration,² technical studies prepared for the Inner Harbor Specific Plan, and published and unpublished hydrologic information from State and local agencies. Potential impacts related to hydrology and water quality associated with implementation of the proposed project and the project variant are described, and mitigation measures are identified, where required.

1. Setting

This section describes the existing hydrology and water quality conditions of the project site, as well as the applicable regulatory framework and local policies.

a. Climate. The climate of the project vicinity is characterized as Mediterranean, with cool wet winters and warm dry summers. The average annual high temperature is approximately 71 degrees Fahrenheit (F), and the average annual low temperature is approximately 47 degrees F.³ The mean annual rainfall in the project vicinity for the period between 1906 and 2012 was approximately 19 inches, and primarily occurred from October through April.⁴ During the period of record, annual rainfall has varied from approximately 8 inches (1976) to approximately 43 inches (1983), with a highest one-day precipitation total of approximately 4.9 inches on October 13, 1962.⁵ Analysis of long-term precipitation records indicates that wetter and drier cycles lasting several years are common in the region.

b. Runoff and Drainage. The project site is relatively flat, with ground surface elevations ranging from approximately 8 to 11 feet referenced to the North American Vertical Datum of 1988 (NAVD88),⁶ and is almost entirely covered by impervious surfaces consisting of asphalt driveways and parking lots, concrete slabs remaining from former structures, and the roofs of existing structures. There is no existing stormwater drainage infrastructure on the project site;⁷ therefore, stormwater runoff leaves the project site as surface runoff. Based on review of a topographic map of the project site⁸ and a map depicting watersheds for the Draft Inner Harbor Specific Plan (IHSP),⁹ surface runoff from the northwest portion of the project site (areas near Redwood Creek) discharges directly into Redwood Creek; surface runoff from the central, eastern, and northeastern portions of the project site

¹ BKF Engineers, 2017. *1538 Maple Street, Redwood City, Engineering Report, Redwood City, California*, April 4.

² ENGEO, 2017. *Geotechnical Exploration, 1548 Maple Street, Redwood City, California*. February 7.

³ Western Regional Climate Center, 2017a. General Climate Summary Tables-Temperature, Redwood City, California. Website: www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca7339 (accessed September 14).

⁴ Western Regional Climate Center, 2017b. General Climate Summary Tables-Precipitation, Redwood City, California. Website: www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca7339 (accessed September 14).

⁵ Ibid.

⁶ BKF Engineers, 2017, op. cit.

⁷ Ibid.

⁸ Ibid.

⁹ West Yost Associates, 2015. *Inner Harbor Specific Plan Utilities Engineering Report*. June.

discharges to the City's stormwater drainage system along Maple Street to the east of the project site; and surface runoff from the southern portion of the project site discharges to a drainage ditch located along the north side of Highway 101, which connects via a culvert to a stormwater drainage system located along the south side of Highway 101 and discharge to Redwood Creek. The area between the eastern and western segments of Maple Street where the Blomquist Street Extension would be constructed is covered by pervious surfaces (a gravel paved storage yard and vegetated areas) and surface runoff from the western portion of this area drains to the stormwater drainage system along the western segment of Maple Street, and surface runoff from the eastern portion of this area drains to the stormwater drainage system along the eastern segment of Maple Street.

The stormwater drainage system along the western segment of Maple Street consists of drainage ditches and drop inlets which connect to a 30-inch diameter reinforced concrete pipe that discharges into Redwood Creek at the north end of the Maple Street. The capacity of this stormwater drainage system is not sufficient for an approximate 10-year event and is consistently inundated with flooding during regular storm and high tide events. The stormwater drainage system along the eastern segment of Maple Street consists of a drainage ditch which connects to the K-Mart Pump Station which discharges to Redwood Creek.¹⁰ Stormwater discharged to Redwood Creek discharges through Redwood Slough into Lower San Francisco Bay (the Bay).

c. Flooding. Areas on and adjacent to the project site are designated as "Special Flood Hazard Areas Subject to Inundation By the 1 percent Annual Chance Flood" Zone AE on the current Flood Insurance Rate Map (FIRM) published by the Federal Emergency Management Agency (FEMA),¹¹ including the northwestern portion of the project site adjacent to Redwood Creek, the northeast portion of the project site adjacent to Maple Street, the western segment of Maple Street, and the area between the western and eastern segments of Maple Street where Blomquist Street is proposed to be extended. The Zone AE designation indicates areas that are subject to inundation by the 1-percent-annual-chance flood (also known as a 100-year flood) event with an established base flood elevation.¹² The base flood elevation for the areas subject to inundation by the 1-percent-annual-chance flood event on and adjacent to the project site is 10 feet NAVD88.¹³ In August 2015, FEMA published an updated Preliminary FIRM¹⁴ for the vicinity of the project site, which altered the extent of the 100-year flood zones on and adjacent to the project site, and maintained the based flood elevation of 10 feet NAVD88 for the 100-year flood zone. The 2015 Preliminary FIRM indicates that the entire northeast portion of the project site, the eastern-central portion of the project site, areas along the southeastern and southwestern boundaries of the project site, and areas along Redwood Creek would be within the 100-year flood zone; and the central portion of the area between the western and eastern segments of Maple Street where the Blomquist Street Extension is proposed would no longer be in the 100-year flood zone, and areas along the drainage ditches adjacent to Maple

¹⁰ Ibid.

¹¹ Federal Emergency Management Agency, 2012. Flood Insurance Rate Map (FIRM), San Mateo County, California, Map Number 06081C0301E, effective October 16.

¹² Base flood elevation is the regulatory requirement for the elevation or flood proofing of structures.

¹³ Federal Emergency Management Agency, 2012, op. cit

¹⁴ Federal Emergency Management Agency, 2015. Preliminary Flood Insurance Rate Map, San Mateo County, California, Map Number 06081C0301F, August 13.

Street would still be within the 100-year flood zone. Flooding is known to occur in the project vicinity during both regular storm events and high tide events.

The project site is not located within a dam inundation area as indicated in the Dam Inundation Flood Hazards Figure from the General Plan.¹⁵

d. Coastal Hazards. The location of the project vicinity (near the Bay) may expose the site to coastal hazards, such as sea level rise, seiche, tsunami, or extreme high tides. These potential hazards are discussed below.

(1) Sea Level Rise. According to the San Francisco Bay Conservation and Development Commission (BCDC), sea level (including in the Bay) is rising and is expected to continue to rise even with existing efforts to mitigate global warming through reduction of greenhouse gas emissions.¹⁶ Rates of sea level rise may vary at specific locations, as local subsidence or uplift affects the relative change in sea level between land masses and the ocean. In the San Francisco Bay area, the background rate of sea level rise has been estimated to be approximately 0.076 inches per year from 1900 to 2008.¹⁷ According to the Sea Level Rise Committee for the San Francisco Capital Planning Committee, sea level rise in the San Francisco area is projected to likely be 6 ± 2 inches between 2000 and 2030, with an unlikely but possible sea level rise of up to 12 inches during this period; sea level rise is projected to likely be 11 ± 4 inches between 2000 and 2050, with an unlikely but possible sea level rise of up to 24 inches during this period; and sea level rise is projected to likely be 36 ± 10 inches between 2000 and 2100, with an unlikely but possible sea level rise of up to 66 inches during this period.¹⁸ In 2017, the California Ocean Protection Council Science Advisory Team (OPC-SAT) published a document providing updates on sea level rise science and presenting sea level rise projections based on various future emissions scenarios and probabilities of occurrence.¹⁹ The 2017 OPC-SAT document presented sea level rise projections that are similar to the projections listed above for 2030 and 2050, and presented a wider range of sea level rise projections for 2100, with a maximum projected sea level rise of up to 10 feet (120 inches) under an extreme sea-level rise scenario.

(2) Seiche. A seiche is the oscillation of a body of water. Seiches occur most frequently in enclosed or semi-enclosed basins such as lakes, bays or harbors. They can be triggered in an otherwise still body of water by strong winds, changes in atmospheric pressure, earthquakes, tsunami, or tides. Triggering forces that set off a seiche are most effective if they operate at specific frequencies relative to the size of an enclosed basin. Coastal measurements of sea level often show

¹⁵ Redwood City, 2010. *Redwood City General Plan, Public Safety*. October 11.

¹⁶ San Francisco Bay Conservation and Development Commission, 2011. *Living with a Rising Bay: Vulnerability and Adaptation in San Francisco Bay and on its Shoreline*, approved October 6.

¹⁷ National Research Council of the National Academies, 2012. *Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future*.

¹⁸ San Francisco, City and County of, 2014. Sea Level Rise Committee. *Guidance for Incorporating Sea Level Rise into Capital Planning in San Francisco: Assessing Vulnerability and Risk to Support Adaptation*. September 22.

¹⁹ California Ocean Protection Council Science Advisory Team, 2017. *Rising Seas in California, an Update on Sea Level Rise Science*. April.

seiches with amplitudes of a few centimeters and periods of a few minutes due to oscillations of the local harbor, estuary, or bay, superimposed on the normal tidal changes. Seiches are not considered a hazard in the Bay based on the basin geometry and dimensions of the Bay.²⁰

(3) Tsunami. Tsunamis are long period water waves caused by underwater seismic events, volcanic eruptions, or undersea landslides. Tsunamis affecting the San Francisco Bay region would originate west of the Bay, in the Pacific Ocean. Areas that are highly susceptible to tsunami inundation tend to be low-lying coastal areas, such as tidal flats, marshlands, and former bay margins that have been artificially filled. Inundation or damage caused by a tsunami may disrupt highway traffic in those low-lying areas. Tsunamis entering San Francisco Bay through the relatively narrow Golden Gate would tend to dissipate as the energy of the wave spreads out as the Bay becomes wider and shallower. The predicted maximum credible tsunami amplitude at the Potrero District of San Francisco (located approximately 19 miles north of the project site) is estimated to be 5.9 feet.²¹ The Bay becomes much wider and shallower over the distance between the Potrero District of San Francisco and the project site, which would dissipate the energy of the tsunami wave significantly.

The California Emergency Management Agency, California Geological Survey, and the Tsunami Research Center at the University of Southern California have produced tsunami inundation maps for areas along the State's coastline, including Redwood City.²² The maps identify areas at risk to inundation from a combination of maximum-considered tsunamis for each area. The tsunami inundation map for the Redwood Point Quadrangle identifies tsunami inundation areas along the banks of Redwood Creek, adjacent to the northwestern boundary of the project site, and covering a small portion of the northeast end of the project site (in the vicinity of the boat ramp).

(4) Extreme High Tides. Extreme high tides in San Francisco Bay result from the combined effects of astronomical high tides (related to the lunar cycle) and other factors, including winds, barometric pressure, ocean temperatures, and freshwater runoff. In California, the highest astronomical tides occur in the summer and winter, and therefore extreme high tides are most likely to occur during these times. The FEMA regional hydrodynamic model output estimates the 100-year tide at a location near the project site (located approximately 2 miles northeast of the project site near the mouth of Redwood Slough) to be approximately 10.68 feet NAVD88.²³

The Mean High High Water (MHHW)²⁴ level at Redwood Creek is 7.2 feet NAVD88, and there are isolated low lying areas of the project site (primarily drainage ditches) that are hydraulically connected to Redwood Creek which are subject to daily inundation from MHHW levels.²⁵ MHHW is approximately 1.5 to 2 feet lower than the 'king tides', which refers to particularly high tides

²⁰ Borrero et. al., 2006. *Numerical Modeling of Tsunami Effects at Marine Oil Terminals in San Francisco Bay*. Report, prepared for: Marine Facilities Division of the California State Lands Commission. June 8.

²¹ Ibid.

²² California Emergency Management Agency, 2009. *Tsunami Inundation Map for Emergency Planning*, State of California, County of San Mateo, Redwood Point Quadrangle, Palo Alto Quadrangle. June 15.

²³ AECOM, 2016. *San Francisco Bay Tidal Datums and Extreme Tides Study*. February.

²⁴ The MHHW is the average of the elevations of daily high tide over a number of years.

²⁵ ESA, 2014. *Redwood City Inner Harbor, Environmental Issues and Options*. February.

occurring several times a year.²⁶ Ground surface elevations at the project site range from approximately 8 to 11 feet NAVD88;²⁷ therefore, flooding of larger areas of the project site could occur during 'king tides' which could have elevations ranging from approximately 8.7 to 9.2 feet NAVD88 at Redwood Creek.

e. Groundwater. The project site is located in the Santa Clara Valley Groundwater Basin, San Mateo Plain Subbasin. The San Mateo Plain Subbasin is listed in the Water Quality Control Plan (Basin Plan) as providing the existing beneficial uses of municipal and domestic water supply, industrial process water supply, and industrial service water supply, and potential beneficial use of agricultural water supply.²⁸

During a recent geotechnical exploration,²⁹ groundwater beneath the project site was measured at approximately 4 feet below ground surface (bgs) in two borings and 1 foot bgs in one boring. The groundwater levels were measured following heavy rainfall events over a series of days and the high water table in one boring was likely due to water infiltration effects at that location.

Fluctuations in groundwater levels should be expected during tidal changes, seasonal changes, or over a period of years because of precipitation changes, perched zones, changes in drainage patterns, irrigation and other conditions. Groundwater levels at sites close to the San Francisco Bay are usually influenced by tidal changes and may fluctuate throughout the day. For design and construction purposes, a groundwater level for the project site of 4 feet bgs was recommended.³⁰

f. Water Quality. The quality of surface water and groundwater in the vicinity of the project site is affected by past and current land uses at the project site and surrounding area and the composition of geologic materials in the vicinity. The State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards regulate the quality of surface water and groundwater bodies throughout California. In the Bay Area, the San Francisco Bay Regional Water Quality Control Board (Regional Water Board) is responsible for implementing the Basin Plan.³¹ The Basin Plan establishes beneficial water uses for waterways and water bodies within the region and is a master policy document for managing water quality in the region.

(1) Groundwater Quality. As discussed above, the project site is located in the Santa Clara Valley Groundwater Basin, San Mateo Plain Subbasin. Groundwater quality in the project area is characterized as slightly alkaline (mean pH of 7.3) with a hardness of 471 milligrams per liter of

²⁶ Ibid.

²⁷ BKF Engineers, 2017, op. cit.

²⁸ San Francisco Bay Regional Water Quality Control Board, 2015a. *San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan)*. Incorporating all amendments as of March 20.

²⁹ ENGEO, 2017, op. cit.

³⁰ Ibid.

³¹ San Francisco Bay Regional Water Quality Control Board, 2015a, op. cit.

calcium carbonate, classifying it as “very hard.” In some areas, water quality may be impaired due to high concentrations of sodium, as a result of tidal influence.³²

(2) Surface Water Quality. As discussed above, stormwater runoff from the project site drains into Redwood Creek, which discharges through Redwood Slough into Lower San Francisco Bay. The Lower San Francisco Bay is listed in the Basin Plan as providing the existing beneficial uses of industrial service supply, commercial and sport fishing, shellfish harvesting, estuarine habitat, fish migration, preservation of rare and endangered species, fish spawning, wildlife habitat, water contact and noncontact recreation, and navigation. Redwood Creek is listed in the Basin Plan as providing the existing beneficial uses of warm freshwater habitat, wildlife habitat, and water contact and noncontact recreation. Redwood Slough is listed in the Basin Plan as providing the existing beneficial uses of estuarine habitat, preservation of rare and endangered species, wildlife habitat, water contact and noncontact recreation, and navigation.³³

As described in the Regulatory Framework Section below, under Section 303(d) of the Clean Water Act (CWA), states must present the U.S. Environmental Protection Agency (USEPA) with a list of “impaired water bodies,” defined as those water bodies that do not meet water quality standards, which in some cases results in the development of a total maximum daily load (TMDL). On a broad level, the TMDL process leads to a “pollution budget” designed to restore the health of a polluted body of water. The TMDL process provides a quantitative assessment of the sources of pollution contributing to a violation of the water quality standards and identifies the pollutant load reductions or control actions needed to restore and protect the beneficial uses of the impaired waterbody.

The State Water Board has listed Lower San Francisco Bay as an impaired water body due to impacts from pollutants including pesticides (chlordane, dichlorodiphenyltrichloroethane [DDT], and dieldrin), mercury, invasive species, dioxins, furans, polychlorinated biphenyls (PCBs), and trash.³⁴ TMDLs have been approved by the USEPA and officially incorporated into the Basin Plan for PCBs and mercury in San Francisco Bay.³⁵ Redwood Creek and Redwood Slough are not listed as impaired water bodies by the State Water Board.³⁶

g. Regulatory Framework. Federal, State, and local regulations and plans related to hydrology and water quality for the area of the project site are described below.

³² California Department of Water Resources, 2004. California’s Groundwater: Santa Clara Valley Groundwater Basin, San Mateo Subbasin, Bulletin 118, February 27.

³³ San Francisco Bay Regional Water Quality Control Board, 2015a, op. cit.

³⁴ State Water Resources Control Board, 2012. *Final 2012 California Integrated Report (Clean Water Act Section 303(d) List/305(b) Report)*. Website: www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2012.shtml (accessed September 20, 2017).

³⁵ San Francisco Bay Regional Water Quality Control Board, 2017. Total Maximum Daily Loads (TMDLs) and the 303(d) List of Impaired Water Bodies. Website: www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/TMDLs (accessed September 20, 2017).

³⁶ State Water Resources Control Board, 2012, op. cit.

(1) Federal Framework. The federal regulations and plans that relate to hydrology and water quality for the area of the project site are described below.

Clean Water Act. The federal CWA of 1972 and subsequent amendments, under the enforcement authority of the USEPA, were enacted “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.” The CWA gave the USEPA the authority to implement pollution control programs, such as setting wastewater standards for industry. It also set water quality standards for surface waters and established the National Pollutant Discharge Elimination System (NPDES) program to protect water quality.

CWA Section 303(d) List of Impaired Water Bodies and TMDLs. In accordance with Section 303(d) of the CWA, states must present the USEPA with a list of “impaired water bodies,” defined as those water bodies that do not meet water quality standards. The CWA requires the development of TMDLs or other actions to improve water quality of impaired water bodies. Implementation of this program in the project area is conducted by the Regional Water Board as discussed under State Regulations, below.

CWA Section 401. Section 401 of the CWA requires that an applicant pursuing a federal permit to conduct an activity that may result in a discharge of a pollutant into waters of the United States to obtain a Water Quality Certification (or waiver). A Water Quality Certification requires the evaluation of water quality considerations associated with dredging or placement of fill materials into waters of the United States. Water Quality Certifications are issued by one of the nine geographically separated Regional Water Boards in California. Under the CWA, the Regional Water Boards must issue or waive a Section 401 Water Quality Certification for a project to be permitted for dredging or placing fill materials into water of the United States under CWA Section 404.

CWA Section 402. Under Section 402 of the CWA, discharge of pollutants to waters of the United States is prohibited unless the discharge is in compliance with an NPDES permit. Implementation and enforcement of the NPDES program is conducted through the State Water Board and the nine Regional Water Boards. The Regional Water Boards set standard conditions for each permittee in their region, which includes effluent limitations and monitoring programs. The proposed project would be subject to NPDES permits described under State Regulations, below.

(2) State and Regional Framework. The State and regional regulations and plans that relate to hydrology and water quality for the area of the project site are described below.

Porter-Cologne Water Quality Control Act. The Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) provides for the protection of the quality of all waters of the State of California for use and enjoyment by the people of California. The act also establishes provisions for a Statewide program for the control of water quality, recognizing that waters of the State are increasingly influenced by interbasin water development projects and other Statewide considerations, and that factors such as precipitation, topography, population, recreation, agriculture, industry, and economic development vary regionally within the State. The Statewide program for water quality control is therefore administered on a local level with statewide oversight. Within this framework, the act authorizes the State Water Board and Regional Water Boards to oversee the coordination and control of water quality within California.

Stormwater Programs. Stormwater quality is regulated by the NPDES Program, established through the federal CWA. The NPDES program objective is to control and reduce pollutant discharges to surface water bodies. Compliance with NPDES permits is mandated by State and federal statutes and regulations. The State Water Board and Regional Water Boards administer a number of stormwater programs to regulate the discharge of pollutants to surface waters from various sources, including construction site stormwater discharges and municipal stormwater discharges.

Municipal Regional Permit. Pursuant to Section 402 of the CWA and the Porter-Cologne Water Quality Control Act, municipal stormwater discharges in the City of Redwood City are regulated under the San Francisco Bay Region Municipal Regional Stormwater NPDES Permit, Order No. R2-2015-0049, NPDES Permit No. CAS612008 (the Municipal Regional Permit [MRP]).³⁷ The MRP is overseen by the Regional Water Board. The City is part of the San Mateo Countywide Stormwater Pollution Prevention Program, which provides guidance and assistance to municipalities in San Mateo County to help them comply with requirements of the MRP.

Provision C.3 of the MRP addresses post-construction stormwater management requirements for development projects. It requires implementation of LID source control, site design, and stormwater treatment for regulated projects. LID employs principles such as preserving and recreating natural landscape features and minimizing impervious surfaces to create functional and appealing site drainage that treats stormwater as a resource, rather than a waste product. Practices used to adhere to these LID principles include measures such as rain barrels and cisterns, green roofs, permeable pavement, preserving undeveloped open space, and biotreatment through rain gardens, bioretention units, bioswales, and planter/tree boxes. As indicated in Attachment C of the MRP, the project site is located within an area that is exempt from hydromodification³⁸ management requirements due to the low gradient of the area.³⁹

Construction General Permit. Projects disturbing more than 1 acre of land during construction are required to comply with the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order No. 2009-0009-DWQ, NPDES No. CAS000002 (Construction General Permit).⁴⁰

To obtain coverage under the Construction General Permit, the project applicant must provide via electronic submittal, a Notice of Intent, a Storm Water Pollution Prevention Plan (SWPPP), and other documents required by Attachment B of the Construction General Permit. Activities subject to the Construction General Permit include clearing, grading, and disturbances to the ground, such as grubbing or excavation. The permit also covers linear underground and overhead projects such as

³⁷ San Francisco Bay Regional Water Quality Control Board, 2015b. San Francisco Bay Region Municipal Regional Stormwater NPDES Permit, Order No. R2-2015-0049, NPDES Permit No. CAS612008. November 19.

³⁸ Hydromodification is defined as the modification of a stream's hydrograph, caused in general by increases in flows and durations that result when land is developed (e.g., made more impervious). The effects of hydromodification include, but are not limited to, increased bed and bank erosion, loss of habitat, increased sediment transport and deposition, and increased flooding.

³⁹ San Francisco Bay Regional Water Quality Control Board, 2015b, op. cit.

⁴⁰ State Water Resources Control Board, 2009. Construction General Permit, 2009-0009-DWQ amended by 2010-0014-DWQ & 2012-0006-DWQ.

pipeline installations. Construction General Permit activities are enforced at a local level by the Regional Water Board.

The Construction General Permit uses a risk-based permitting approach and mandates certain requirements based on the project risk level (i.e., Level 1, Level 2, or Level 3). The project risk level is based on the risk of sediment discharge and the receiving water risk. The sediment discharge risk depends on the project location and timing (i.e., wet season versus dry season activities). The receiving water risk depends on whether the project would discharge to a sediment-sensitive receiving water. The determination of the project risk level would be made by the project applicant when the Notice of Intent is filed (and more details of the timing of the construction activity are known).

The performance standard in the Construction General Permit is that dischargers shall minimize or prevent pollutants in stormwater discharges and authorized non-stormwater discharges through the use of controls, structures, and best management practices (BMPs) that achieve Best Available Technology (BAT) for treatment of toxic and non-conventional pollutants and Best Conventional Technology (BCT) for treatment of conventional pollutants. A SWPPP must be prepared by a Qualified SWPPP Developer that meets the certification requirements in the Construction General Permit. The purpose of the SWPPP is (1) to help identify the sources of sediment and other pollutants that could affect the quality of stormwater discharges; and (2) to describe and ensure the implementation of BMPs to reduce or eliminate sediment and other pollutants in stormwater as well as non-stormwater discharges resulting from construction activity. Operation of BMPs must be overseen by a Qualified SWPPP Practitioner that meets the requirements outlined in the permit.

The SWPPP must also include a construction site monitoring program. Depending on the project risk level, the monitoring program may include visual observations of site discharges, water quality monitoring of site discharges (pH, turbidity, and non-visible pollutants, if applicable), and receiving water monitoring (pH, turbidity, suspended sediment concentration, and bio-assessment).

The Construction General Permit allows non-stormwater discharge of dewatering effluent if the water is not contaminated and is properly filtered or treated, using appropriate technologies such as clarifier tanks or sand filters. If the dewatering activity is deemed by the local Regional Water Board not to be covered by the Construction General Permit, then the discharger would be required to prepare a Report of Waste Discharge, and if approved by the local Regional Water Board, be issued site-specific waste discharge requirements (WDRs) under NPDES regulations. Site-specific WDRs contain rigorous monitoring requirements and performance standards that, when implemented, ensure that receiving water quality is not substantially degraded. The discharge of dewatering effluent is authorized under the Construction General Permit if the following conditions are met.

- The discharge does not cause or contribute to a violation of any water quality standard.
- The discharge does not violate any other provision of the Construction General Permit.
- The discharge is not prohibited by the applicable Basin Plan.
- The discharger has included and implemented specific BMPs required by the Construction General Permit to prevent or reduce the contact of the non-stormwater discharge with construction materials or equipment.
- The discharge does not contain toxic constituents in toxic amounts or (other) significant quantities of pollutants.

- The discharge is monitored and meets the applicable numeric action levels.
- The discharger reports the sampling information in the annual report.

If any of the above conditions are not satisfied, the discharge of dewatering effluent is not authorized by the Construction General Permit. The discharger must notify the local Regional Water Board of any anticipated non-stormwater discharges not already authorized by the Construction General Permit or another NPDES permit, to determine whether a separate NPDES permit is necessary.

(3) Local Regulatory Considerations. Applicable local regulations related to hydrology and water quality are described below.

Redwood City General Plan. The Safety Element of the Redwood City General Plan contains the following goals, policies, and programs related to hydrology and water quality.

Goal PS-7: Provide adequate and appropriately-designed storm drainage and flood control facilities to meet current and future needs and minimize the risk of flooding.

- Policy PS-7.1: Avoid or minimize the risks of flooding to new development. Carefully evaluate whether new development should be located in flood hazard zones, and identify construction methods or other methods to minimize damage if new development is located in flood hazard zones.
- Policy PS-7.2: Improve the drainage system's level of service to minimize storm flooding.
- Policy PS-7.2: Prioritize improvements to Redwood City's storm drain system in areas that are prone to flooding. Encourage the use of preventive and low-impact measures as well as maintaining, upgrading, and constructing new flood prevention infrastructure to reduce the risk of flooding.
- Policy PS-7.5: Consult with public agencies responsible for flood protection, including the U.S. Army Corps of Engineers, FEMA, and the California Department of Water Resources to maintain the most current flood hazard and floodplain information and use it as a basis for project review of flood protection systems such as levees and to guide development in accordance with federal, State, and local standards.
- Policy PS-7.6: Minimize impervious surfaces to reduce stormwater runoff and increase flood protection.
- Policy PS-7.8: Address flooding potential as a result of sea level rise.
- Program PS-27: New Development Protected from Flooding. Require new development to be designed to provide protection from potential impacts of flooding resulting from significant flood events, consistent with evolving State and federal guidelines and as directed by the City Engineer, and to consider possible sea level rises.
- Program PS-41: Stormwater and Creek Protection. Adopt a Creek Enhancement Ordinance. Address the following in the ordinance: flood control issues, biological resource opportunities, aesthetics, recreational/trail opportunities, public safety issues, property owners' responsibilities to correct/improve creek banks (including offering incentives such as rebates, classes/seminars, technical assistance, etc.)

- Program PS-49: Levees Upgraded to FEMA Standards. Upgrade existing levees in accordance with FEMA standards and FEMA direction to protect residential and commercial areas against 100-year flood hazards and sea level rise.
- Program PS-52: Creekside Property Owner Education. Educate Creekside property owners in low-cost, ecologically enhancing methods to maintain and improve creek bank stability, habitat restoration, and prevent bank erosion.
- Program PS-59: Flood Insurance Rate Map Revisions. Initiate flood insurance rate map revisions for city projects, when appropriate.

City of Redwood City Stormwater Management and Discharge Control Program Ordinance. Chapter 27A of the Redwood City Code of Ordinances describes requirements for stormwater management, including illicit discharges, reductions of pollutants in stormwater, best management practices for new developments and redevelopments, watercourse protection, notifications of spills, requirements to test or monitor discharges, and stormwater treatment measures and maintenance programs.

City of Redwood City Floodplain Management Ordinance. Chapter 41 of the Redwood City Code of Ordinances describes requirements for floodplain management, including restricting or prohibiting uses which are dangerous to health, safety and property due to water or erosion hazards, or which result in damaging increases in erosion or flood heights or velocities; requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction; controlling the alteration of natural floodplains, stream channels and natural protective barriers which help accommodate or channel floodwaters; controlling filling, grading, dredging and other development which may increase flood damage; and preventing or regulating the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas.

2. Impacts and Mitigation Measures

This section discusses potential impacts to hydrology and water quality that could result from implementation of the proposed project. The section begins with the criteria of significance, which establish the thresholds used to determine whether an impact is significant. The latter part of this section presents the impacts associated with the proposed project and identifies mitigation measures, as appropriate.

a. Criteria of Significance. Implementation of the proposed project would have a significant impact on the environment related to hydrology and water quality if it would:

- Violate any water quality standards or waste discharge requirements;
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or proposed uses for which permits have been granted);
- Result in substantial erosion or siltation on- or off-site that would affect the quality of receiving waters;

- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course, or increasing the rate or amount of flow, of a creek, river or stream in a manner that would result in substantial erosion, siltation, or flooding, both on- or off-site;
- Create or contribute substantial runoff which would exceed the capacity of existing or planned stormwater drainage systems;
- Create or contribute substantial runoff which would be an additional source of polluted runoff;
- Otherwise substantially degrade water quality;
- Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;
- Place within a 100-year flood hazard area structures which would impede or redirect flood flows;
- Expose people or structures to a substantial risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam; or
- Expose people or structures to a substantial risk of loss, injury or death as a result of inundation by seiche, tsunami, or mudflow.

b. Project Impacts. The following section discusses potential hydrology and water quality impacts associated with implementation of the proposed project. Potential impacts are differentiated between project construction and operational phases, where applicable. Impacts are also differentiated for the proposed project and project variant where applicable.

(1) Water Quality Standards. Potential operation and construction period impacts associated with water quality standards are discussed below.

Construction. During construction of the project, exposed soils and any chemicals spilled or leaked onto the ground may be entrained in stormwater runoff that discharges into Redwood Creek. Because construction would disturb more than 1 acre of land, the proposed project would be required to comply with the Construction General Permit. The Construction General Permit requires the development of a SWPPP by a Qualified SWPPP Developer. A SWPPP identifies all potential pollutants and their sources, including potential erosion-causing activities, construction materials to be used on-site, and includes a list of BMPs to reduce discharges of construction-related stormwater pollutants. A SWPPP also includes a detailed description of controls to reduce pollutants, outlines maintenance and inspection procedures, and is kept onsite for ongoing monitoring requirements. Typical sediment and erosion control BMPs include protecting storm drain inlets, establishing and maintaining construction exits, and perimeter controls such as installation of straw wattles or silt curtains around the perimeter of a site. A SWPPP also identifies proper building material staging areas, paint and concrete washout areas, proper equipment/vehicle fueling and maintenance practices, controls for equipment/vehicle washing, and allowable non-stormwater discharges, and includes a spill prevention and response plan.

Dewatering may be performed during construction activities involving excavation. Dewatering effluent may have high turbidity and could contain contaminants. Turbid/contaminated groundwater

could cause degradation of the receiving water quality if discharged directly to storm drains or surface water without treatment. Any groundwater dewatering would be limited in duration (i.e., during construction) and the discharge of dewatering effluent would be subject to permits from Silicon Valley Clean Water (SVCW) or the Regional Water Board, depending if the discharge were to the sanitary sewer or storm drain system, respectively.

Under existing State law, it is illegal to allow unpermitted non-stormwater discharges to receiving waters. As stated in the Construction General Permit, non-storm water discharges directly connected to receiving waters or the storm drain system have the potential to negatively impact water quality. The discharger must implement measures to control all non-stormwater discharges during construction, and from dewatering activities associated with construction. Discharging any pollutant-laden water from a dewatering site or sediment basin into any receiving water or storm drain that would cause or contribute to an exceedance of applicable water quality standards is prohibited.⁴¹

The Construction General Permit allows the discharge of dewatering effluent if the water is properly filtered or treated, using appropriate technology. These technologies include, but are not limited to retention in settling ponds (where sediments settle out prior to discharge of water) and filtration using gravel and sand filters (to mechanically remove the sediment). If the dewatering activity is deemed by the Regional Water Board not to be covered by the Construction General Permit, then the discharger could potentially prepare a Report of Waste Discharge, and if approved by the Regional Water Board, be issued site-specific WDRs under the NPDES regulations. Site-specific WDRs contain rigorous monitoring requirements and performance standards that, when implemented, ensure that receiving water quality is not substantially degraded.

If the water is not suitable for discharge to the storm drain (receiving water), as discussed above, dewatering effluent may be discharged to SVCW sanitary sewer system if discharge criteria are met. These include, but are not limited to, application of treatment technologies or BMPs which will result in achieving compliance with the wastewater discharge limits. Discharges to SVCW facilities must occur under a permit. SVCW manages the water it accepts into its facilities so that it can ensure proper treatment of wastewater at the treatment facility prior to discharge.⁴²

If it is infeasible to meet the requirements of the Construction General Permit, acquire site-specific WDRs, or meet the SVCW sewer discharge requirements, the construction contractor would be required to transport the dewatering effluent off-site for treatment.

As discussed in Section IV.G. Hazards and Hazardous Materials, former operations on the project site have resulted in soil contamination from releases of hazardous materials, and undocumented fill material which could potentially be contaminated is present on the project site. If contaminants are present in existing soils reused on the project site or in imported fill materials that are placed in a location exposed to stormwater runoff (e.g., soil placed as engineered fill or for surcharging), the associated contaminants could leach into stormwater runoff and potentially reduce the quality of the receiving water.

⁴¹ State Water Resources Control Board, 2009, op. cit.

⁴² Silicon Valley Clean Water, 2017. Environmental Services. Website: www.svcw.org/departments/SitePages/Environmental%20Services.aspx (accessed September 26).

Impact HYD-1: If construction of the proposed project or the project variant results in the reuse of existing contaminated soil or contaminated imported fill materials for use as engineered fill or for surcharging, impacts to water quality could occur. (S)

Implementation of the following mitigation measure would ensure that the proposed project would result in less-than-significant impacts related to water quality during construction of the project.

Mitigation Measure HYD-1: Implement Mitigation Measure HAZ-1. (LTS)

As discussed in Section IV.G, Hazards and Hazardous Materials, Mitigation Measure HAZ-1 requires engineering fill and surcharge materials to be tested and approved for use by the City and Regional Water Board prior to being imported to the project site or prior to re-use of existing material excavated from the project site to ensure that it would not pose an unacceptable risk to the environment.

Required compliance with State and local regulations regarding stormwater and dewatering during construction, and implementation of Mitigation Measure HAZ-1 would ensure that the proposed project would result in less-than-significant impacts to water quality during construction.

Operation. During operation of the proposed project, changes to land-use activities and drainage patterns could adversely affect the quality of stormwater runoff that discharges into Redwood Creek. Because the proposed project site would replace over 10,000 square feet of existing impervious surface area, the proposed project would be required to comply with Provision C.3 requirements of the MRP.⁴³ The proposed project would result in alteration of over 50 percent of the existing impervious surface of the project site, and therefore all new and replaced impervious surfaces would require treatment under the MRP. The project proposes LID stormwater management systems including bio-retention areas in various locations throughout the project site, which would either allow stormwater runoff to infiltrate the ground surface or remove pollutants from the stormwater runoff prior to discharging into a new on-site storm drainage system. The new drainage system would connect to the City's existing storm drainage system on Maple Street, which discharges to Redwood Creek. In accordance with the Provision C.3 requirements, the proposed stormwater treatment system has been sized to treat a flow rate based on a rainfall intensity of 0.2 inches per hour, and the minimum size of bio-retention areas was calculated to be 4 percent of the total impervious area with a 6-inch ponding depth.⁴⁴

Required compliance with Provision C.3 of the MRP would ensure that the proposed project would result in less-than-significant impacts to water quality during operation of the project.

(2) Depletion of Groundwater Resources. Potential operation and construction period impacts associated with groundwater resources are discussed below.

⁴³ San Francisco Bay Regional Water Quality Control Board, 2015b, op. cit.

⁴⁴ BKF Engineers, 2017, op. cit.

Construction. Because of the shallow depth to groundwater on the project site, dewatering may be performed during construction activities involving excavation. Construction-related dewatering would be temporary and limited to the area of excavations on the project site and would not substantially contribute to depletion of groundwater supplies. Therefore, the construction of the proposed project would result in less-than-significant impacts related to depletion of groundwater resources.

Operation. Operation of the proposed project would not involve dewatering or the use of groundwater as potable water, because potable water would be supplied to the project site by the City via connections to existing infrastructure. The existing project site is almost entirely covered by impervious surfaces (a total of approximately 6.4 acres). The proposed project would result in a decrease in impervious surface coverage of approximately 1.4 acres on the project site compared to existing conditions. Under the proposed project variant there would be a similar net decrease in impervious surface coverage compared to the existing condition. Both development options would decrease impervious surface coverage compared to existing conditions and therefore increase the infiltration of rainwater and recharge of groundwater resources beneath the project site. The construction of LID stormwater management systems, including bio-retention areas, would also increase stormwater infiltration to the ground surface and groundwater recharge beneath the project site. Therefore, the operation of the proposed project would result in less-than-significant impacts related to depletion of groundwater resources.

(3) Erosion and Siltation. Potential operation and construction period impacts associated with erosion and siltation are discussed below.

Construction. As discussed above, the proposed project would be required to comply with the Construction General Permit, which requires preparation and implementation of a SWPPP that includes erosion and sediment control BMPs. Compliance with these State regulations would ensure that the proposed project would have a less than-significant-impact related to erosion and siltation during construction activities.

Operation. As discussed above, the proposed project would be required to comply with the Provision C.3 of the MRP, which requires treatment of stormwater.

The proposed project would involve construction of a 2- to 3-foot-tall retaining wall along the shoreline of Redwood Creek to maintain the new grade of the raised project site. The façade of the new wall would be located a minimum of 5 feet from the existing top of bank. Portions of the retaining wall would be located within the current 100-year flood zone along Redwood Creek. The base flood elevation along Redwood Creek, which is currently 10 feet NAVD88, would be expected to rise in the future due to sea level rise. Construction of the retaining wall and placement of fill material within the current 100-year flood zone along Redwood Creek could increase the depth and velocity of flood flows along the top of the existing bank by constricting the width of flood flows compared to the existing condition. This could result in erosion of the top of the existing bank along Redwood Creek and siltation downstream. In addition, the proposed project includes reconstruction of Maple Street within the current 100-year flood zone.

Impact HYD-2: The retaining wall, placement of fill material, reconstruction of Maple Street or other improvements occurring within the current 100-year flood zone along Redwood Creek could increase the depth and velocity of flood flows along the existing banks, which could result in erosion and siltation during operation of the proposed project and the project variant. (S)

Implementation of the following mitigation measure would ensure that the proposed project would result in less-than-significant impacts related to erosion or siltation during operation of the project.

Mitigation Measure HYD-2: Proposed improvements within 100-year flood zones and coastal flooding hazard areas, and proposed improvements affecting stormwater drainage systems (e.g., the proposed retaining wall and placement of fill and/or other potential improvements) shall be analyzed using detailed hydraulic evaluations to ensure that the improvements would not impede or redirect flood flows, contribute to exceeding the capacity of existing stormwater drainage systems, or alter the hydrodynamics of stormwater flows such that erosion could occur. The detailed hydraulic evaluations shall be performed and certified by a professional engineer, and shall quantify the following information.

- The potential for improvements within 100-year flood zones, coastal flooding hazard areas, and drainage courses to impede or redirect flood flows including storm-related flooding and coastal flooding hazards including tsunamis, sea level rise, and extreme high tides.
- The potential for improvements to stormwater drainage systems to exceed the capacity of existing off-site stormwater drainage systems.
- The potential for improvements within 100-year flood zones, coastal flooding hazard areas, and drainage courses to result in changes to the extent and depth of flooding,

The detailed hydraulic evaluations should also identify receptors and properties that could be affected by the potential changes to flooding conditions. If project improvements could cause erosion, alter existing flooding conditions, or contribute to exceeding the capacity of stormwater drainage systems, project designs shall be modified to reduce the potential flooding and erosion impacts. Modifications to project designs may include the following measures.

- Altering the location and design of the retaining wall and embankments that would be constructed to raise the elevation of the project site.
- Installing erosion controls systems such as rock protection or erosion resistant vegetation.
- Increasing the size of proposed culverts.
- Installing cross-flow culverts for improvements through flood zones.
- Improving existing off-site stormwater drainage systems that would receive runoff from the project site.
- Installing on-site stormwater detention systems in accordance with the City's drainage guidelines for residential development.
- Including additional storage by replacing the existing storm drain line within Maple Street with a new 48-inch storm drain line or larger from US 101 up to and including the tide gate at Redwood Creek to account for tide gate operation of the existing outfall, as determined by the Engineering and Transportation Division.

The detailed hydraulic evaluations and proposed changes to the project designs, if necessary, shall be submitted to the City and any other regulatory agencies that have jurisdiction over the improvements prior to the issuance of a grading permit. (LTS)

Implementation of Mitigation Measure HYD-2 would ensure that the proposed project would result in less-than-significant impacts related to erosion or siltation.

(4) Flooding Due to Changes in Drainage Patterns. Potential operation and construction period impacts associated with flooding and changes in drainage patterns are discussed below.

Construction. Construction of the proposed project would involve raising the elevation of the project site and surcharging of the project site with fill material, which would alter the existing surface runoff drainage patterns. Surface runoff from areas of the project site could be redirected and concentrated in areas such as the drainage ditch along the north side of Highway 101, the Homeless Shelter and Maple Street Correctional Center located adjacent to the south of the project site, or along Maple Street to the east of the project site, which could contribute to localized flooding at these off-site locations. There is evidence of ponding along Maple Street due to the inadequacy of existing surface drainage and the reliance on gravity flow drainage to the Bay in the area;⁴⁵ therefore, redirecting any additional surface runoff to Maple Street could further increase existing flooding conditions.

Impact HYD-3: Placement of engineered fill to raise the elevation of the project site and placement of surcharge materials would alter existing drainage patterns which could result in flooding of off-site areas during construction of the proposed project and the project variant.
(S)

Implementation of the following mitigation measure would ensure that the proposed project would result in less-than-significant impacts related to flooding associated with changing drainage patterns during construction of the project.

Mitigation Measure HYD-3: The project applicant shall prepare a Construction Period Stormwater Drainage Control Plan which shall be submitted to the City for review and approved prior to the issuance of a grading permit. The Construction Period Stormwater Drainage Control Plan shall include figures depicting the proposed grading of engineered fill and surcharge stockpiles and describe construction period drainage control systems (e.g., temporary berms and swales). The plan shall also include detailed hydraulic evaluations of stormwater runoff patterns, including surface runoff flow directions, flow lines within the temporary drainage control systems, and estimated discharge rates and volumes for all site grading and surcharging stages. The proposed grading and temporary drainage control systems shall be designed such that the estimated rates and volumes of surface runoff discharge to existing off-site stormwater drainage systems would not increase beyond the existing condition. If rates and volumes of surface runoff discharge to existing off-site stormwater drainage systems would increase beyond the existing condition, the Construction Period Stormwater

⁴⁵ ESA, 2014. op. cit.

Drainage Control Plan shall demonstrate that the existing off-site stormwater drainage systems have capacity to convey the increased discharge. (LTS)

Operation. New stormwater drainage infrastructure would be constructed on the project site which would alter drainage patterns compared to the existing condition. Currently stormwater surface runoff from the project site drains to three separate areas: directly into Redwood Creek, into a drainage ditch located along the north side of Highway 101 which connects to stormwater drainage systems on the south side of Highway 101, and into the stormwater drainage system along Maple Street. The preliminary plans for the proposed new stormwater drainage system on the project site indicate that a larger portion of the project site would drain to the stormwater drainage system along Maple Street compared to the existing condition, because the southern portion of the project site that currently drains to the drainage ditch along the north side of Highway 101 would drain to the stormwater drainage system along Maple Street. As previously discussed, the proposed project would result in an overall decrease in stormwater runoff leaving the project site as it would decrease the amount of impervious surface on the project site compared to the existing condition, and it would include stormwater treatment bio-retention areas which would allow stormwater runoff to infiltrate the ground surface; however, because the project would alter the drainage pattern to convey runoff from a larger portion of the project site to the existing stormwater drainage system along Maple Street, the proposed project could contribute to exceeding the capacity of the existing stormwater drainage system along Maple Street, which could result in localized flooding at the project site or flooding upstream of the project site.

The area between the eastern and western segments of Maple Street where the Blomquist Street Extension would be constructed currently drains to stormwater drainage systems along Maple Street. The extension of Blomquist Street through this area would cross over existing drainage ditches (which would require the construction of culverts) and through 100-year flood zones. The extension of Blomquist Street could alter the drainage within the flood zones and within the drainage ditches along Maple Street, which could impede or redirect flood flows and result in flooding of areas off-site. Runoff from the new impervious surface created by the extension of Blomquist Street could also contribute to exceeding the capacity of existing stormwater drainage systems along Maple Street, which could result in flooding upstream of the project site.

Impact HYD-4: The proposed project and the project variant would result in the alteration of the existing drainage pattern which could contribute to flooding on- and off-site during operation of the project. (S)

Implementation of the following mitigation measure would ensure that the proposed project would result in less-than-significant impact related to flooding associated with changing drainage patterns during operation of the project.

Mitigation Measure HYD-4: Implement Mitigation Measure HYD-2. (LTS)

Implementation of Mitigation Measures HYD-3 and HYD-4 would ensure that the proposed project would result in less-than-significant impacts related to flooding associated with changes to drainage patterns.

(5) Exceed Capacity of Existing or Planned Stormwater Drainage Systems. Potential operation and construction period impacts associated with the capacity of the storm drainage system are discussed below.

Construction. As previously discussed, drainage patterns would be altered during construction of the project which could redirect stormwater runoff to various off-site areas and contribute to exceeding the capacity of existing off-site stormwater drainage systems. This was identified as Impact HYD-3, and implementation of Mitigation Measure HYD-3 would ensure that the proposed project would have a less-than-significant impact related to exceeding the capacity of existing stormwater drainage systems during construction of the project.

Operation. As previously discussed, drainage patterns would be altered during operation of the project which could redirect additional stormwater runoff to the existing stormwater drainage systems along Maple Street and contribute to exceeding the capacity of the existing stormwater drainage systems. This was identified as Impact HYD-4, and implementation of Mitigation Measure HYD-4, which requires implementation of Mitigation Measure HYD-2, would ensure that the proposed project would have a less-than-significant impact related to exceeding the capacity of existing stormwater drainage systems during operation of the project.

(6) Create or Contribute Substantial Runoff Which Would be an Additional Source of Polluted Runoff. Potential operation and construction period impacts associated with the potential for polluted runoff from the site are discussed below.

Construction. As previously discussed, the proposed project would be required to comply with the Construction General Permit and implement BMPs to reduce discharges of construction-related stormwater pollutants; however, if contaminants are present in reused existing soil or in imported fill materials that are placed in a location exposed to stormwater runoff during construction (e.g., soil placed as engineered fill or for surcharging), contaminants could leach into stormwater runoff from the reused existing soil or imported fill and result in pollution of stormwater runoff. This was identified as Impact HYD-1, and implementation of Mitigation Measure HYD-1, which requires implementation of Mitigation Measure HAZ-1, would ensure that the proposed project would have a less-than-significant impact related to creating a substantial source of polluted runoff during construction of the project.

Operation. Operation of the proposed project would create potential sources of polluted runoff associated with motor vehicle traffic and the use of fertilizers for landscaped areas. Pollutants that may be transported in runoff from parking areas and roadways include sediment; metals; organic compounds including diesel, gasoline, and oil; and trash and debris. As previously discussed, the proposed project would be required to comply with Provision C.3 requirements of the MRP, and the proposed project would include treatment of stormwater in bio-retention areas prior to discharging of stormwater to storm drainage systems, which would ensure that the proposed project would have a less-than-significant impact related to creating a substantial source of polluted runoff during operation of the project.

(7) Other Water Quality Degradation Impacts. Potential impacts to water quality other than those described above have not been identified for the proposed project. Therefore the proposed project would have no other water quality impacts.

(8) Housing in Flood Zones. The proposed project would include construction of housing within and adjacent to 100-year flood zones with a base flood elevation of 10 feet NAVD88, as designated by FEMA.⁴⁶ The ground surface of the project site would be raised to an elevation of 13 feet NAVD88 by placement of engineered fill, which is 3 feet above the current base flood elevation, to mitigate potential flooding of housing and account for future sea level rise. Raising the ground surface of the project site prior to construction of housing would ensure that the proposed project would result in a less-than-significant impacts associated with placing housing in a flood zone.

(9) Impede or Redirect Flood Flows in Flood Zones. The proposed project would involve construction and operation of improvements within 100-year flood zones, including a proposed retaining wall and fill material within the 100-year flood zone along Redwood Creek, fill material and housing within the 100-year flood zone adjacent to Maple Street in the northeast portion of the project site, and extension of Blomquist Street through the 100-year flood zones located between the eastern and western segments of Maple Street. The extension of Blomquist Street would also require crossing over drainage ditches within the 100-year flood zones. The construction and operation of these proposed improvements could potentially impede or redirect flood flows. Housing would be constructed in compliance with the City's Flood Plain Management Ordinance, Chapter 41 of the Redwood City Municipal Code regarding development in a floodplain including but not limited to finished floor elevations and the Letter of Map Revision (LOMR) processes.

Impact HYD-5: The construction and operation of improvements associated with the proposed project and the project variant within 100-year flood zones could potentially impede or redirect flood flows. (S)

Implementation of the following mitigation measure would ensure that the proposed project would result in less-than-significant impact related to impeding or redirecting flood flows in flood zones.

Mitigation Measure HYD-5: Implement Mitigation Measures HYD-2 and HYD-3. (LTS)

Implementation of Mitigation Measure HYD-5 would ensure that the proposed project would result in less-than-significant impacts related to impeding or redirecting flood flows in flood zones.

(10) Flood Hazards from Levees or Dams. The project site is not located within a dam inundation area as indicated in the Dam Inundation Flood Hazards Figure from the General Plan.⁴⁷ There is a levee mapped by FEMA in the northeastern portion of the project site.⁴⁸ The 2015 Preliminary FIRM⁴⁹ indicates that this feature is a non-accredited levee, dike, or floodwall. Based on the review of a topographic map of the site, there is not a discernable levee in the northeast portion of the project site; however an area of slightly higher ground surface elevation appears to have been interpreted by FEMA as a levee. This "levee" does not protect the project site from 100-year flood

⁴⁶ Federal Emergency Management Agency, 2012, op. cit.

⁴⁷ Redwood City, 2010, op. cit.

⁴⁸ Federal Emergency Management Agency, 2012, op. cit.

⁴⁹ Federal Emergency Management Agency, 2015, op. cit.

events as there are 100-year flood zones mapped on both sides of the “levee”.⁵⁰ The “levee” may provide some protection from less major flooding events and coastal flooding hazards. The proposed project would involve the placement of fill material to raise the project site above the elevation of this “levee”, which would improve the mitigation of potential flooding risks that this “levee” may provide some protection from. Therefore proposed project would not be subject to flooding hazards associated with failure of a levee or dam.

(11) Inundation by Seiche, Tsunami, or Mudflow. Because the project site and surrounding area is relatively level, there would not be any expected mudflows. Seiches are not considered a hazard in the Bay based on the basin geometry and dimensions of the Bay.⁵¹ There are potential tsunami inundation areas mapped along the banks of Redwood Creek, adjacent to the northwestern boundary of the project site, and covering a small portion of the northeast end of the project site (in the vicinity of the boat ramp). The proposed project would involve the placement of fill material to raise the project site above the existing elevation, which would reduce the likelihood of potential tsunami inundation of limited areas that are currently mapped as potential tsunami inundation areas. The proposed project would not exacerbate potential tsunami inundation of the project site or other areas, and therefore the proposed project would result in less-than-significant impacts associated with inundation by seiche, tsunami, or mudflow.

c. Cumulative Impacts. The geographic area of concern for cumulative hydrology and water quality impacts is the areas of Redwood City which discharge stormwater to the same stormwater drainage systems that serve the project site, and the surface water bodies that receive runoff from the project site, primarily Redwood Creek, Redwood Slough, and the Bay. Stormwater discharges are affected by urban pollutants that contribute to the degradation of water quality in surface waters near the project site. Urban pollutants in stormwater include petroleum hydrocarbons, sediments, metals, pesticides, and trash. Past, current and reasonably foreseeable projects in the vicinity of the project site could result in cumulative impacts associated with stormwater discharges, similar to the potential impacts from construction of the proposed project. In order to adequately address cumulative water quality impacts, stormwater regulations have become progressively more stringent since the passage of the federal CWA, and current NPDES permits now require new development and redevelopment projects to manage and treat all significant sources of stormwater pollutants and reduce runoff. NPDES permit requirements apply to the cumulative projects as well as the proposed project. As such, a reduction in runoff and overall pollutant loads in stormwater in the vicinity of the project site is anticipated over time, thereby reducing cumulative impacts. Although overall water quality in Redwood Creek, Redwood Slough, and the Bay is anticipated to improve over time, the Bay is currently designated as “impaired” by the State Water Board.

The implementation of Mitigation Measures HAZ-1, HYD-2, HYD-3, HYD-4, and HYD-5 would ensure that stormwater runoff from the proposed project would not result in cumulatively considerable impact associated with water quality, flooding, erosion/sedimentation, or exceeding storm drainage capacity.

⁵⁰ Federal Emergency Management Agency, 2012, op. cit.

⁵¹ Borrero et. al., 2006, op. cit.

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I. UTILITIES AND SERVICE SYSTEMS

This section describes the utility systems (water, wastewater, solid waste, energy, and telecommunications) serving the project site and identifies the potential impacts to utilities that could result from implementation of the proposed project. Potential impacts related to utilities and service systems would be similar for the proposed project and the project variant and are not differentiated in this section. Mitigation measures are identified, where required. Impacts to the stormwater system are also more fully discussed in Section IV.H, Hydrology and Water Quality.

1. Setting

This section addresses the following utilities: water supply, treatment, and distribution; wastewater collection, treatment, and disposal; solid waste; and energy and telecommunications.

a. Water Service. The City provides water within its incorporated limits, portions of the San Mateo County, and parts of the Town of Woodside and the City of San Carlos. The City's water service area covers approximately 17 square miles and is generally bounded by Interstate 280 to the west, US 101 and San Francisco Bay to the east, Whipple Avenue to the north, and Marsh Road to the south. The City's service area also includes the non-contiguous Redwood Shores area.

(1) Water Supply. The City purchases all of its potable water from Hetch Hetchy, a part of the San Francisco Public Utilities Commission's (SFPUC) Regional Water System (RWS), and is a member of the Bay Area Water Supply and Conservation Agency (BAWSCA). Hetch Hetchy is fed mostly from Sierra Nevada snowmelt but also includes rainfall and runoff collected in a number of reservoirs: Calaveras, San Antonio, and Crystal Springs. Water received from the SFPUC is already treated, and does not require any further water treatment by the City. The City also supplies recycled water to its customers. Redwood City's Individual Supply Guarantee (ISG) from the SFPUC is 10.93 million gallons per day (mgd) or approximately 12,243 acre-feet¹ (AF) per year. Phase I of the City's recycled water plan has been implemented and recycled water is served to customers east of US 101 in Redwood Shores, the Greater Bayfront Area, and the Seaport Area. Phase II of the City's recycled water plan is currently underway, and will bring recycled water pipes west of US 101 towards downtown.²

(2) Water Distribution. The City's potable water distribution system has 13 turnouts from the five SFPUC RWS Bay Division pipelines located in Redwood City. There are also eight active interties with the California Water Service Company, Mid-Peninsula Water District, and the City of Menlo Park. The potable water distribution system delivers water to 24 pressure zones through approximately 259 miles of pipelines, 12 active storage reservoirs, and 10 booster pump stations.

The City currently has a total storage capacity of 21.2 million gallons and is in the process of constructing additional system storage. Of the 10 booster pumps located throughout the City, 6 of the

¹ Acre foot is a unit of measurement that is equivalent to the volume of water necessary to cover 1 acre to a depth of 1 foot. It is equal to 93,500 cubic feet or 325,851 gallons.

² Erler & Kalinowski, Inc., 2016. *2015 Urban Water Management Plan for the City of Redwood City*. June.

stations have permanent standby generators. The City also has four portable generators and a portable pump for emergency use.

(3) Water Demand. The City's total water demand is the sum of potable and recycled water demand. In 2015, the City's total annual water demand was 9,589 acre-feet (AF).³ Demand for potable water in the city was 8,876 AF, and for recycled water was 712 AF. Between 2011 and 2015 approximately 68 percent of potable water demand was by residential uses, 18 percent by commercial, industrial, and institutional uses, 8 percent by irrigation uses, and 4 percent by non-revenue water.⁴ Water demand within the City has generally decreased, with the highest per capita water use measured in 2007 at 141 gallons per capita per day (GPCD), whereas the lowest per capita water use was observed in 2015 at 89 GPCD.⁵

(4) Recycled Water. The Redwood City Recycled Water Project (Recycled Water Project) began design and construction in 2004, and included permanent recycled water treatment and storage facilities at the Silicon Valley Clean Water (SVCW), formerly known as South Bayside System Authority, a recycled water distribution system, and on-site customer retrofit facilities.⁶ The Recycled Water Project has a design capacity of up to 3,238 AF per year (AFY). The Recycled Water Project has been implemented in two phases. Phase I of the Recycled Water Project, which included the design and construction of facilities to serve customers east of US 101 in Redwood Shores and the Greater Bayfront Area, including the project site, has been completed. Phase II of the Recycled Water Project will expand the recycled water service area west of US 101 to downtown Redwood City. The facilities constructed to date can supply up to 2,000 AFY of recycled water, and provide the flexibility to deliver up to 3,238 AFY in the future. The Recycled Water Project is administered by the City's Public Works Services (PWS) department. The PWS department is responsible for operation and maintenance of the distribution facilities, retrofit process, permitting and monitoring, reporting, and overall program condition.⁷

Recycled water is not currently supplied to the project site. A 24-inch recycled water line is located along US 101 and on Maple Street, east of the Redwood City Police Department building.⁸

b. Wastewater. Wastewater treatment for Redwood City is provided by the Silicon Valley Clean Water (SVCW) treatment plant. SVCW operates under a joint powers authority (JPA) with four member agencies: the cities of Redwood City, Belmont, and San Carlos, and the West Bay Sanitary District. Redwood City has agreements with five San Mateo County sewer districts in adjacent unincorporated areas to collect and convey wastewater for treatment. These districts include the Emerald Lake Heights, Fair Oaks, Kensington Square, Oak Knoll and Edgewood Sewer Districts.⁹

³ Ibid.

⁴ Non-revenue water includes unmetered water consumption and distribution system water losses.

⁵ Erler & Kalinowski, Inc., 2016, op. cit.

⁶ Redwood City, City of, 2011. *2010 Urban Water Management Plan*. June 13.

⁷ Erler & Kalinowski, Inc., 2016, op. cit.

⁸ BKF Engineers, 2017. *1538 Maple Street, Redwood City, Engineering Report, Redwood City, California*, April 4.

⁹ Redwood City, City of, 2010. *Redwood City New General Plan, Draft Environmental Impact Report, Section 4.15 Utilities*.

(1) Wastewater System. The wastewater collection system consists of a collection of pipes that deliver wastewater to the SVCW wastewater treatment plant. In total, the City operates, maintains, and repairs approximately 194 miles of public sewer mains, 82 miles of public laterals, and 31 lift stations.

The existing off-site sewer system includes an 8-inch line on Maple Street that flows to an existing 48-inch main, also on Maple Street. The 48-inch main connects to a pump station where Maple Street intersects with US 101, where sewage is then pumped to the SVCW treatment plant.¹⁰

(2) Wastewater Treatment and Disposal. The SVCW treatment plant has an operating capacity of 29 million gallons per day (mgd) average dry weather flow (ADWF). The plant is permitted by the Water Board to discharge 29 mgd ADWF into San Francisco Bay. Redwood City has maximum capacity right of 11.4 mgd ADWF. The current permitted peak wet weather capacity of the SVCW facility is 71 mgd. Redwood City's peak wet weather allocation at the treatment plant is approximately 30.5 mgd.

c. Solid Waste. Recology San Mateo County provides solid waste collection, recycling, transportation, and disposal services to Redwood City customers under a franchise agreement. Collected waste is transported to the Shoreway Environmental Center located in the City of San Carlos.¹¹ There are nine landfills that serve the Redwood City area. Approximately 90 percent of the solid waste collected from Redwood City is sent to the Ox Mountain Sanitary Landfill, located east of Half Moon Bay in unincorporated San Mateo County. The Ox Mountain Sanitary Landfill is estimated to have a remaining capacity of at least 22 million cubic yards or 36 percent of its total potential capacity.¹² While this landfill is currently permitted to operate through May 2022, the closure date is subject to adjustment and extension under the direction of Cal Recycle, the State's waste reduction and management agency. The Ox Mountain Sanitary Landfill has a permitted throughput¹³ of 3,598 tons per day.¹⁴

d. Energy and Telecommunications. The following section describes energy and telecommunications services within the City.

(1) Energy. The Pacific Gas & Electric Company (PG&E) transmits and distributes electricity and provides natural gas service, optional electricity service, billing services, and maintenance and repair services to the City. PG&E charges connection and user fees for all new development in addition to sliding rates for electrical and natural gas service based on use. Electrical services are currently available at the project site.

¹⁰ BKF Engineers, 2017, op. cit.

¹¹ Redwood City, City of, 2010, op. cit.

¹² CalRecycle, 2017. Facility/Site Summary Details: Corinda Los Trancos Landfill (Ox Mtn) (41-AA-002). Website: www.calrecycle.ca.gov/SWFacilities/Directory/41-AA-0002/Detail (accessed July 24, 2017).

¹³ Permitted throughput is the maximum permitted amount of waste a landfill can handle and dispose of in one day. This figure is established in the current solid waste facilities permit issued by the Integrated Waste Management Board.

¹⁴ CalRecycle, 2017. Solid Waste Facility Permit. Facility Number 41-AA-0002. June 6.

Title 24, California's Energy Efficiency Standards for Residential and Nonresidential Buildings, details requirements to achieve minimum energy efficiency standards of the State of California. The standards apply to new construction of both residential and nonresidential buildings, and regulate energy consumed for heating, cooling, ventilation, water heating and lighting. Compliance with these standards is verified and enforced through the local building permit process.

(2) Telecommunications. A number of telecommunications providers currently service Redwood City. AT&T is the City's primary telephone provider (or Incumbent Local Exchange Carrier [ILEC]).¹⁵ AT&T, Comcast, Wave, and Etheric Networks all provide broadband internet service to Redwood City. Additionally, AT&T, Comcast and Wave, as well as Dish Network, provide cable television to the City. All of these service providers are privately owned and operated and recover the costs of operation, maintenance, and capital improvement through connection and user fees, which are collected from all customers. These services are currently available at the project site.

The California Public Utilities Commission, which regulates California's telecommunication industry, requires that local phone service providers anticipate and serve new growth. To meet this requirement, local phone service providers continually upgrade their facilities and infrastructure, adding new facilities and technology to remain in conformance with California Public Utilities Commission tariffs and regulations and to serve customer demand in the City.

e. Regulatory Framework. The following section describes the federal, State, and local regulatory framework related to water, solid waste management, and other utilities.

(1) Federal Regulations. The following describes federal regulations concerning utilities, including the Safe Drinking Water Act, National Pollutant Discharge Elimination System, and Energy Policy Act.

Safe Drinking Water Act. The Safe Drinking Water Act (SDWA) of 1974 gave the United States Environmental Protection Agency (USEPA) the authority to set standards for contaminants in drinking water supplies. The USEPA was required to establish primary regulations for the control of contaminants that affected public health and secondary regulations for compounds that affect the taste, odor, and aesthetics of drinking water. Under the provisions of SDWA, the California Department of Health Services (DHS) has the primary enforcement responsibility. Title 22 of the California Administrative Code establishes DHS authority, and stipulates State drinking water quality and monitoring standards.

National Pollutant Discharge Elimination System. Treated wastewater is closely regulated for health and environmental concerns, and is included in the National Pollutant Discharge Elimination System (NPDES) program. The San Francisco Bay Regional Water Quality Control Board regulates operations and discharges from sewage systems through the NPDES permit adopted on October 14, 2009. The permit provides a uniform standard for wastewater and stormwater

¹⁵ California Public Utilities Commission, 2014. Incumbent Local Exchange Carrier Territory in California – 2014 (map). Available online at: [www.cpuc.ca.gov/uploadedImages/CPUC_Public_Website/Content/Utilities_and_Industries/Communications - Telecommunications and Broadband/Consumer Programs/Broadband Availability/ILEC%20Territory%20in%20CA%20-%202014.jpg](http://www.cpuc.ca.gov/uploadedImages/CPUC_Public_Website/Content/Utilities_and_Industries/Communications_-_Telecommunications_and_Broadband/Consumer_Programs/Broadband_Availability/ILEC%20Territory%20in%20CA%20-%202014.jpg) (accessed October 12, 2017).

discharges for the counties and agencies surrounding the San Francisco Bay. The City is mandated to comply with the NPDES Permit by State and federal laws, statutes, and regulations.

Energy Policy Act of 1992. The Federal Energy Regulatory Commission (FERC) regulates the transmission and sale of electricity in interstate commerce (including interstate gas pipelines that serve California), licensing of hydroelectric projects, and oversight of related environmental matters. As part of the license application process, environmental analysis pursuant to the National Environment Policy Act (NEPA) must be conducted. FERC acts under the legal authority of the Federal Power Act of 1935, the Public Utility Regulatory Policies, and the Energy Act of 1992, in addition to several other federal acts. The Energy Act of 1992 addresses energy efficiency, energy conservation and energy management, natural gas imports and exports, and alternative fuels (including as used in motor vehicles). It amended parts of the Federal Power Act of 1935.

(2) State Regulations. The following describes State regulations concerning utilities, including the Urban Water Management Planning Act, Senate Bills 610 and 221, the Water Conservation Act, the California Integrated Waste Management Act, and the responsibilities of the California Public Utilities Commission and the California Energy Commission.

Urban Water Management Planning Act. In 1983, the California Legislature enacted the Urban Water Management Planning Act (Water Code Sections 10610–10656). The act requires that every urban water supplier that provides water to 3,000 or more customers or that provides over 3,000 AFY, prepare and adopt an Urban Water Management Plan (UWMP). Water suppliers are to prepare a UWMP within a year of becoming an urban water supplier and update the plan at least once every 5 years. The act also specifies the content that is to be included in an UWMP. It is the intention of the legislature to permit levels of water management planning commensurate with the number of customers served and the volume of water supplied. The act states that urban water suppliers should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple-dry years. The act also states that the management of urban water demands and the efficient use of water shall be actively pursued to protect both the people of the state and their water resources.

Senate Bills 610 and 221. In 2003, Senate Bill (SB) 610 and SB 221 were signed into law by Governor Gray Davis. SB 610 requires public water systems that supply water to proposed projects to determine whether the projected water demand (associated with the proposed project) could be met when existing and planned future uses are considered. For the purposes of SB 610, Water Code Section 10912 (a)(2) requires all projects with a water demand equivalent to 500 or more dwelling units, or which include over 250,000 square feet of commercial office building, to obtain a Water Supply Assessment (WSA). In addition, SB 610 requires a quantification of water received by the water provider in prior years from water rights, water supply entitlements, and water service contracts. Under SB 221, approval by a city or county of certain residential subdivisions requires an affirmative written verification of sufficient water supply.

The Water Conservation Act of 2009 (Senate Bill x7-7 [2009]). Senate Bill x7-7 (SBx7-7) requires all water suppliers to increase water use efficiency. SBx7-7 mandates the reduction of per capita water use and agricultural water use throughout the State by 20 percent by 2020.

California Integrated Waste Management Act (Assembly Bill 939). In 1989, the California Legislature enacted the California Integrated Waste Management Act (Assembly Bill [AB] 939), which requires the diversion of waste materials from landfills in order to preserve landfill capacity and natural resources. Cities and counties in California were required to divert 25 percent of solid waste by 1995, and 50 percent of solid waste by the year 2000. AB 939 further requires every city and county to prepare two documents demonstrating how the mandated rates of diversion will be achieved. The Source Reduction and Recycling Element (SRRE) must describe the chief source of the jurisdiction's waste, the existing diversion programs, and current rates of waste diversion and new or expanded diversion programs. The Household Hazardous Waste Element (HHWE) must describe each jurisdiction's responsibility in ensuring that household hazardous wastes are not mixed with non-hazardous solid wastes and subsequently deposited at a landfill.

California Public Utilities Commission. The California Public Utilities Commission (CPUC) regulates privately owned telecommunication, electric, natural gas, water, railroad, rail transit, and passenger transportation companies. General Order 121-d gives the CPUC permitting authority over construction of new and expanded power plants, electric transmission lines, and substations. Pursuant to CEQA, an environmental analysis must be conducted before issuance of construction permits by CPUC. CPUC Decision 95-08-038 contains the rules for the planning and construction of new transmission facilities, distribution facilities, and substations. The CPUC also regulates local natural gas distribution facilities and services, as well as interstate pipelines.

California Energy Commission. The California Energy Commission (CEC) is the State's primary energy policy and planning agency. The CEC was created by the Legislature in 1974 and is responsible for the following: forecasting future energy needs and keeping historical energy data; licensing thermal power plants 50 megawatts or larger; promoting energy efficiency by setting the State's appliance and building efficiency standards; supporting public interest energy research that advances energy science and technology; supporting renewable energy by providing market support to existing, new, and emerging renewable technologies; developing and implementing the State Alternative and Renewable Fuel and Vehicle Technology Program to reduce the State's petroleum dependency and help attain the State climate change policies; administering more than \$300 million in American Reinvestment and Recovery Act funding through State programs; and planning for and directing the State response to energy emergencies.

(3) Local Policies. The following describes local policies concerning utilities, including those of the Redwood City 2015 Urban Water Management Plan, the Redwood City General Plan, and the Municipal Code.

Redwood City 2015 Urban Water Management Plan. Updated every five years in accordance with California's Urban Water Management Act, the City's 2015 Urban Water Management Plan provides an overview of water supply and usage, wastewater, and recycled water. The most recent plan is the 2015 Urban Water Management Plan which was adopted in June 2016.

Redwood City General Plan. The Built Environment, Public Safety, and Natural Resources Elements of the General Plan contain policies related to utilities, as listed below:

- Policy BE-40.1: Improve the level of service, reliability, quality, and life cycle of the city's potable and recycled water storage and distribution system.

- Policy BE-40.2: Maintain the city's water system to ensure adequate fire flow.
- Policy BE-40.6: Support the expansion of the city's Recycled Water Service Area, and actively promote widespread use of recycled water in and around Redwood City.
- Policy BE-41.1: Continue to ensure adequate treatment capacity and collection system for Redwood City's wastewater conveyed to Silicon Valley Clean Water (formerly South Bayside System Authority) treatment facilities while protecting water quality and public health, and minimizing adverse impacts to the environment.
- Policy BE-41.2: Work with Silicon Valley Clean Water (formerly South Bayside System Authority) member agencies to ensure that the treatment facility has sufficient capacity to meet future wastewater treatment needs.
- Policy BE-41.3: Minimize groundwater infiltration and inflow to the wastewater collection system to maintain sufficient peak wet weather capacity and continue to explore other possible options to reduce peak wet weather flow.
- Policy BE-42.1: Require that improvements and maintenance to electric and gas transmission and distribution systems that are made to accommodate new growth be performed in a manner that maintains safety, reliability, and environmental compatibility.
- Policy BE-42.2: Support efforts to increase the use of renewable energy and low-emission power sources. Encourage the installation and construction of renewable energy systems and facilities such as wind, solar, hydropower, geothermal, and biomass facilities.
- Policy BE-43.2: Require new buildings, particularly taller buildings, to be designed with sufficient space to accommodate wireless communications equipment.
- Policy BE-44.2: Continue to require the placement of utilities underground with new development.
- Policy BE-45.1: Meet or exceed State mandates regarding the diversion of waste from landfills.
- Policy BE-45.2: Encourage recycling, composting, and source reduction by residential and non-residential sources in Redwood City.
- Policy BE-45.3: Promote green building practices with respect to recycling material from building demolition and using recycled building materials in new construction.
- Policy NR-2.1: Encourage, facilitate, and/or require the use of water conserving appliances and fixtures in new development.
- Policy NR-2.2: Encourage use of drought-tolerant, low-water consuming landscaping as a means of reducing overall and per capita water demand.
- Policy NR-3.1: Require new development to demonstrate that adequate water is available before project approval and to fund its fair-share costs associated with the provision of water service.
- Policy NR-4.1: Support energy efficiency through the City's Municipal Code Green Building Ordinance.
- Policy NR-4.4: Pursue efforts to reduce energy consumption through appropriate energy conservation and efficiency measures throughout all segments of the community.

- Policy PS-8.4: Encourage the use of green building practices to reduce potentially hazardous materials in construction materials.

Redwood City Municipal Code. Redwood City Municipal Code Section 38.52, Recycled Water Service Area; Required Use, implements State policies requiring the use of recycled water for non-potable water uses within the designated recycled water use are where it has been determined to be or is expected to be available.

Chapter 27 of the Municipal Code discusses Redwood City's sanitary sewerage facilities, including fees, connections, and usage regulations. Article XI, Recycling and Salvaging of Construction and Demolition Debris, of Chapter 9 of the Municipal Code implements regulations to reduce waste in landfills generated by construction projects, comply with environmental goals set forth in City and State Green Buildings Codes, and comply with requirements set forth in AB 939, as well as requires the submittal and approval of a Waste Management Plan (WMP) for covered projects.

2. Impacts and Mitigation Measures

The following section presents a discussion of the impacts related to utilities and infrastructure that could result from implementation of the proposed project. The section begins with the criteria of significance, which establish the thresholds to determine if an impact is significant. The latter part of this section presents the impacts associated with implementation of the proposed project and the recommended mitigation measures, if required.

a. Criteria of Significance. Development of the proposed project would result in a significant impact related to utilities and service systems if it would:

- Require new or expanded entitlements from the water service provider in order to provide sufficient water supplies;
- Require or result in the construction of new water treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Generate a demand for wastewater treatment that exceeds the capacity of the wastewater treatment provider when considered in addition to the provider's existing commitments or result in a determination by the wastewater treatment provider that serves, or may serve, the project that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments;
- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board;
- Require or result in the construction of new wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Generate a demand for solid waste disposal that cannot be accommodated by the landfill serving the project area or be inconsistent with federal, State or local statutes and regulations related to solid waste; or

- Result in determination by the energy and natural gas or telecommunications provider which serves or may serve the project site that it does not have adequate capacity to serve the project’s projected demand in addition to the providers’ existing commitments and require or result in the construction of new energy facilities or expansion of existing facilities, construction of which would cause significant environmental effects.

b. Project Impacts. The following discussion describes the potential impacts related to utilities and service systems that could result from implementation of the proposed project.

(1) Water Demand. The proposed project would include 131 townhomes, as well as associated opens space, circulation and parking, infrastructure, soil remediation, and grading improvements. Based on historical water consumption for similar uses within the City, total annual water demand for the proposed project is estimated at 24.91 acre feet, as shown in Table IV.I-1.

Table IV.I-1: Annual Project Water Demand

| Land Use | Project Size | Annual Demand Per Type of Land Use (gallons) | Annual Project Demand (gallons) | Annual Project Demand (acre-feet) |
|--------------|--------------|--|---------------------------------|-----------------------------------|
| Residential | 289 persons | 21,900 per person | 6.33 million | 19.42 |
| Landscaping | 289 persons | 6,205 per person | 1.79 million | 5.49 |
| <i>Total</i> | | | | <i>24.91</i> |

Source: BKF Engineers, 2017. *1548 Maple Street, Redwood City, Engineering Report*. September 1.

With current water demand at the project site totaling approximately 1.97 AF per year, the proposed project would result in a net increase in demand of 22.94 AF per year. As noted above, in 2015 the City’s total annual water demand was 9,589 AF, leaving an available capacity of 2,654 AF. The increased demand from the proposed project would account for approximately 0.86 percent of the available water supply for the City. Therefore, the increase in water demand would be within the anticipated range for projected growth within the City, and would not lead to insufficient water supplies related to existing entitlements and resources, or require new or expanded entitlements. Therefore, the proposed project would constitute a less-than-significant impact upon water supply availability and demand.

(2) Water Service Infrastructure. Domestic water service for the proposed project would be provided by a new 24-inch high-density polyethylene (HDPE) main installed along Maple Street and portions of the Blomquist Street Extension connecting to an existing 12-inch water line located on Maple Street. Water service within the project site would be provided through a new 10-inch HDPE main looped through the site and connecting to the new 24-inch main. A domestic water and fire flow analysis prepared for the proposed project determined that the proposed water system can provide at least 35 pounds per square inch (psi) of water service pressure during peak hour demand, satisfying the City’s minimum service pressure requirement.¹⁶

¹⁶ The City’s minimum service pressure is 35 psi.

Recycled water service for the proposed project would be provided by a new 10-inch HDPE main looped through the site along Maple Street and portions of the Blomquist Street Extension connecting to an existing 24-inch main within the Caltrans right-of-way, and an existing 24-inch main at the intersection of Maple Street and Blomquist Street. Water service within the project site would be provided through new 10-inch HDPE mains. The existing recycled water system provides approximately 55 pounds per square inch (psi) of water service pressure during peak hour demand, however it is expected that due to future development and expansion of recycled water use the system will provide approximately 30 pounds psi. The future drop in pressure would need to be considered by the project applicant and the applicant would be required to provide booster pumps and other accessories to adequately maintain service within the site. Development of the project would also need to follow the Redwood City Recycled Water Development Standards Guide as is required for all development projects located within the recycled water service area.

Additionally, the proposed water system satisfies the City's requirements for maximum flow velocity under normal service conditions, and minimum required fire flows.¹⁷ Therefore, the proposed project would not result in demand for potable water that would exceed the capacity of the proposed water delivery infrastructure, and the impact would be less than significant.

(3) Wastewater Treatment. As described above, the SVCW treatment plant's dry weather capacity is 29 mgd, of which Redwood City has a maximum output of 11.4 mgd. In 2015, Redwood City's average daily flow was 5.82 mgd (51 percent of allocated plant capacity). The proposed project would generate 0.02 mgd of wastewater, increasing the City's daily flow to approximately 5.84 mgd (51.2 percent of allocated plant capacity).¹⁸ Because the proposed project would allow the City to remain well below its allocated dry weather capacity at the SVCW treatment plant, it would result in a less-than-significant impact related to wastewater treatment and disposal and would not exceed the capacity of SVCW's system nor exceed the treatment requirements of the Water Quality Control Board.

(4) Wastewater Infrastructure. The proposed project would result in the installation of a new 6-inch sewer line that would tie into the existing 8-inch City sewer line on Maple Street. The proposed sewer system would conform to the design criteria established in the Redwood City Design Criteria Section VI.¹⁹ As stated above, the proposed project would generate 0.02 mgd of wastewater, or 0.035 cubic feet per second, which would account for approximately 12 percent of the capacity of an 8-inch sewer line. A sewer modeling analysis prepared by BKF Engineers shows that the existing gravity sewer lines have adequate capacity to convey sewage flows to the existing 8-inch city sewer line on Maple Street.²⁰ Therefore, the proposed project would have a less-than-significant impact on wastewater infrastructure.

¹⁷ BKF Engineers, 2017. *Domestic Water and Fire Flow Analysis at 1548 Maple Street*. August 4.

¹⁸ Erler & Kalinowski, Inc., 2016, op. cit.

¹⁹ Redwood City, City of. *Engineering Standards Volume 3: Design Criteria*.

²⁰ BKF Engineers, 2017. 1548 Maple Street, Redwood City Engineering Report. September 1.

(5) Solid Waste. The proposed project would be served by landfills with the capacity to handle solid waste generated by the demolition and operational phases of the proposed project. Demolition waste from existing structures, paved asphalt areas, and utilities would be collected and hauled off to the Shoreway Environmental Center Transfer Station for landfill diversion and recycling. Demolition, grading, and construction would yield approximately 10,000 tons of demolition waste. As required by Assembly Bill (AB) 939, the California Integrated Waste Management Act, a minimum of 50 percent of the City's waste must be recycled. Per Section 9.192 of the Redwood City Municipal Code, the construction contractor would be required to recycle and/or salvage a minimum of 50 percent, or 5,000 tons, of the nonhazardous construction and demolition debris. Additionally, all new construction projects are required to divert a minimum of 60 percent of the total generated nonhazardous construction and demolition debris. Therefore, the proposed project could generate up to approximately 4,000 tons of debris that would go to the landfill. As stated above, the Ox Mountain Sanitary Landfill has approximately 22 million cubic (approximately 16 million tons) yards of capacity. Therefore, the proposed project would not substantially decrease the available capacity at the Ox Mountain Sanitary Landfill.

CalRecycle estimates an average waste generation rate of 12.23 pounds per household per day.²¹ As stated previously, the proposed project would result in the development of 131 new townhomes. This would amount to an estimated 1,602 pounds per day (approximately 0.8 pounds per day) of solid waste. This represents less than 0.02 percent of the daily permitted throughput for the Ox Mountain Sanitary Landfill. In addition, Recology of San Mateo County provides recycling services to the project site. These services contribute to a reduction in solid waste generated by proposed development. The amount of solid waste generated by operation of the proposed project would not exceed the capacity of development of the proposed project would have a less-than-significant impact on landfill capacity.

(6) Electricity, Gas, and Telecommunications. Development of the proposed project would occur in a location that currently has electricity, gas, telephone, cable, and internet services and these services would continue to be provided to the project site to serve the proposed development. Infrastructure on the site that provides these services would be undergrounded with development of the proposed project. As such, the proposed project would have a less-than-significant impact on electricity, gas, telecommunications, cable, and internet services.

c. Cumulative Impacts. The cumulative geographic context for utilities for development consists of the project site in addition to the surrounding areas and uses abutting the project site.

The area surrounding the project site is largely developed with a mix of residential, industrial, public, infrastructure, and Port-related uses. Development of the proposed project would increase the intensity of residential development within the vicinity of the project site; however, other development projects are dispersed geographically throughout the City such that they would not combine with the project to result in cumulative impacts related to utilities. Additionally, all other cumulative development has been, or will be, subject to development guidance contained within the General Plan, prescribed by zoning, and enforced through the building permit process to avoid

²¹ CalRecycle, 2017. Estimated Solid Waste Generation Rates. Website: www2.calrecycle.ca.gov/WasteCharacterization/General/Rates (accessed September 28, 2017).

demand for utility service that exceeds the City's current capacity. Individual development projects are required to demonstrate that capacity is available and provided by existing infrastructure prior to approval, or is required to construct or pay the fair share towards needed upgrades if existing systems are insufficient. Based on the information in this section and for the reasons summarized above, development of the proposed project would not contribute to any significant adverse cumulative utility impacts when considered together with other cumulative development.

V. CEQA-REQUIRED ASSESSMENT CONCLUSIONS

As required by CEQA, this chapter discusses the following types of impacts that could result from implementation of the proposed project: growth-inducing impacts; significant irreversible changes; effects found not to be significant; and significant unavoidable effects.

A. GROWTH INDUCEMENT

A project is considered growth-inducing if it would directly or indirectly foster substantial economic or population growth or the construction of additional housing, either directly or indirectly, in the surrounding environment. Examples of projects likely to have significant growth-inducing impacts include extensions or expansions of infrastructure systems beyond what is needed to serve project-specific demand, and development of new residential subdivisions or industrial parks in areas that are only sparsely developed or are underdeveloped. Typically, development projects on sites that are designated for development and surrounded by existing suburban uses are not considered adversely growth-inducing because growth in areas that already have development and infrastructure available to serve new development are generally considered environmentally beneficial.

Implementation of the proposed project would result in direct population growth within the City of Redwood City through the construction of 131 dwelling units. As discussed in Section XIII, Population and Housing in the Initial Study (Appendix B), the proposed project could increase the local population by up to 360 persons. The growth would account for less than one percent of the City's current estimated population (84,950) and approximately two percent of the City's projected population growth by 2040 (100,800 total population). This level of population growth is included within the anticipated growth identified by the City and the Association of Bay Area Government (ABAG), and would be a less-than-significant impact. As such, the proposed project would neither directly or indirectly lead to substantial or unforeseen economic or population growth, but would instead contribute to the City's housing supply.

Additionally, the proposed project would involve infill development within an existing urbanized area and would not require the extension of utilities or roads into undeveloped areas that are not planned for the expansion of infrastructure or directly or indirectly lead to the development of greenfield sites. Due to the location of the project site, the presence of existing uses on and in the vicinity of the site, and consistency with the General Plan, construction of the proposed project would not induce unplanned growth in the area. Therefore, the growth that would occur as a result of the proposed project would not be substantial or adverse.

B. SIGNIFICANT IRREVERSIBLE CHANGES

CEQA requires that EIRs assess whether the proposed project would result in significant irreversible changes to the physical environment. The *CEQA Guidelines* discuss three categories of significant irreversible changes that should be considered. Each is addressed below.

1. Changes in Land Use Which Commit Future Generations

The project site is located within the Redwood Creek/Harbor Center area of the City, and is generally surrounded open space, recreational, and public uses. The approximately 7.88-acre project site is currently developed and construction of the proposed project would occur on land that is designated for urban uses. Therefore, the proposed project would not commit future generations to a significant change in land use.

2. Irreversible Damage from Environmental Accidents

No significant environmental damage, such as accidental spills or explosion of a hazardous material, is anticipated to occur with development of the proposed project or the project variant. Implementation of Mitigation Measures HAZ-1 through HAZ-3, as identified in Section IV.G, Hazards and Hazardous Materials, would ensure that the potential for accidental release of hazardous materials into the environment are reduced to a less-than-significant level. No irreversible changes – such as those which might result from construction of a large-scale mining project, a hydroelectric dam project, or other institutional project – would result from development of the proposed project.

3. Consumption of Non-Renewable Resources

Consumption of nonrenewable resources includes increased energy consumption, conversion of agricultural lands, and lost access to mining reserves. As discussed in the Initial Study (Appendix B), the State Department of Conservation designates the site as “Urban and Built-Up Land,” and the site is located in an urbanized area of Redwood City. Therefore, no existing agricultural lands would be converted to non-agricultural uses. In addition, the project site does not contain known mineral resources and does not serve as a mining reserve; thus, development of the proposed project would not result in the loss of access to mining reserves. Please refer to the Initial Study included in Appendix B for a discussion of impacts related to agricultural and mining resources.

Construction of the proposed project would require the use of energy, including energy produced from non-renewable resources. Energy consumption would also occur during the operational period of the proposed project. The proposed project is expected to be relatively energy efficient and would incorporate green building measures in compliance with the latest CALGreen’s standard building measures for residential buildings and Title 24 requirements. As discussed in Section VII, Greenhouse Gas Emissions of the Initial Study, the proposed project would not result in any significant impacts associated with an increase in greenhouse gas emissions or conflict with measures adopted for the purpose of reducing such emissions, such as the City’s Community Climate Action Plan. Additionally, the proposed project would not require the construction of major new lines to deliver energy or natural gas as these services are already provided in the area. Therefore, the proposed project would not result in a significant impact associated with the consumption of nonrenewable resources.

C. EFFECTS FOUND NOT TO BE SIGNIFICANT

The environmental topics analyzed in Chapter IV, Setting, Impacts, and Mitigation Measures, represent those topics which generated the greatest potential controversy and expectation of adverse impacts. As discussed in more detail in the Initial Study (Appendix B) the following topics are not addressed in this EIR because impacts related to these topics either would not occur or would be less

than significant. A summary of the conclusions provided in the Initial Study analysis for each of the topics scoped out of the EIR is provided below.

1. Aesthetics

The proposed project would not result in any change in views of or from Bair Island, Greco Island, or the salt crystallization ponds east of Seaport Boulevard, or scenic views of these areas; therefore, views from scenic vistas across the baylands towards San Francisco Bay would continue to be available. Overall, the proposed project would represent an improvement to visual quality and character of the site through the development of a cohesive residential community with opportunities for public recreation. The development review process and compliance with the Building Code and Title 24 standards would ensure that light and glare impacts from the proposed project would not affect scenic views in the area. In addition, the project would be required to comply with City ordinances and regulations governing development design standards and thus would not degrade the existing visual character or quality of the site and its surroundings.

Therefore, potential impacts related to scenic vistas, visual quality and character of the site, and light and glare would be less than significant.

2. Agricultural and Forestry Resources

The project site and vicinity are located within an urban area in the City of Redwood City. The site is currently zoned as Tidal Plain (TP) on the City's Zoning Map and is classified as "Urban and Built-Up Land" by the State Department of Conservation.¹ The project site is not used for agricultural production nor does it support forestry resources. Therefore, there would be no impact to agricultural and forestry resources.

3. Geology and Soils

The project site is not located within or adjacent to an Alquist-Priolo Earthquake Fault Zone and is therefore not subject to fault rupture. Compliance with the applicable Building Code and the recommendations of a site-specific design-level geotechnical investigation would ensure that potential impacts associated with seismic hazards and unstable site soils, including liquefaction, lateral spreading, surface settlement, and landslides would be less than significant. In addition, the proposed project would be required to implement a Stormwater Pollution Prevention Plan to ensure that impacts associated with soil erosion would be reduced. Finally, development of the proposed project would not involve the use of septic tanks or alternative wastewater disposal systems. Therefore, impacts related to geology and soils would be less than significant.

4. Greenhouse Gas Emissions

The proposed project would not result in construction- or operation-period greenhouse gas emissions that would exceed thresholds established by the Bay Area Air Quality Management District. Furthermore, the proposed project would be consistent with the City's Community Climate Action Plan. Therefore, impacts related to greenhouse gas emissions would be less than significant.

¹ California, State of, 2014. Department of Conservation. California Important Farmland Finder. Website: maps.conservation.ca.gov/ciff/ciff.html (accessed April 2017).

5. Mineral Resources

The developed project site is located within an urban area. There are no known mineral resources within the City of Redwood City, or in the vicinity of the project site. Therefore, the project would not result in the loss of availability of a known mineral resource that would be of value to the region or residents of the State.

6. Population and Housing

The proposed project could increase the local population by up to 360 persons. The projected population growth is included within the anticipated growth projections identified by the Association of Bay Area Governments and the City of Redwood City. The proposed project would neither directly or indirectly lead to substantial or unforeseen population growth in the City beyond what is already planned. The proposed project would not displace any existing housing, necessitating the construction of replacement housing elsewhere. Therefore, the proposed project would have a less-than-significant impact related to population and housing.

7. Public Services

The proposed project would be adequately served by existing public services, such as police, fire protection, and school services. New facilities would not be required to provide police and fire services in order to meet service standards. Compliance with SB 50 would ensure that any impact to schools that could result from the proposed project would be offset by development fees, and in effect, reduce potential impacts to schools to a less-than-significant level. Although the project would incrementally increase use of area parks and community and regional recreational facilities, this increase is not expected to result in substantial physical deterioration of local parks and recreational facilities. Therefore, the proposed project would not result in an adverse effect on police, fire, school, or recreational services and would not require the construction of new facilities.

8. Recreation

Residents of the proposed project would be expected to use local parks and community facilities in the City, as well as regional recreational facilities. Although the proposed project would incrementally increase use of these facilities, this minor increase in use is not expected to result in substantial physical deterioration of local parks, trails, and community centers and this impact would be less-than-significant.

The proposed project would involve the redevelopment of the project site with residential uses, including recreational components including on-site open space for use by project residents and public recreational uses, including a segment of the Bay Trail. These improvements are fully evaluated in the Initial Study and this EIR. The proposed project does not include or require the construction or expansion of existing recreational structures or similar facilities. Therefore, development of the proposed project and associated recreational opportunities for use by project residents would not result in additional environmental effects beyond those described in this EIR.

9. Tribal Cultural Resources

No tribal resources are known to occur or have been identified at the project site. In addition, the California Legislature passed Assembly Bill (AB) 52, which provides for consultation between lead agencies and Native American tribal organizations during the CEQA process. Effective July 1, 2015,

AB 52 states that prior to the release of an Environmental Impact Report or Negative Declaration/ Mitigated Negative Declaration for public review, a lead agency must provide the opportunity to consult with local tribes. A request form describing the proposed project was sent to the Native American Heritage Commission (NAHC) in West Sacramento requesting a list of tribes eligible to consult with the City, pursuant to Public Resources Code section 21080.3.1. On May 31, 2017, the NAHC responded in a letter with a list of tribal contacts. The City sent the Notice of Preparation (NOP) of an EIR to be prepared for the project to these individuals on July 6, 2017. To date, no requests for consultation have been received.

D. SIGNIFICANT UNAVOIDABLE IMPACTS

No significant and unavoidable impacts were identified in the Initial Study or the EIR.

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VI. ALTERNATIVES

In accordance with CEQA and the CEQA Guidelines (Section 15126.6), an EIR must describe a range of reasonable alternatives to the project, or to the location of the project, that would “feasibly attain most of the project's basic objectives, while avoiding or substantially lessening any of the significantly adverse environmental effects of the project.” An EIR does not need to consider every conceivable alternative to a project; rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decision-making and public participation. The range of alternatives required in an EIR is governed by a “rule of reason.”

The proposed project involves the redevelopment of the project site with 131 three-story for sale, market-rate townhomes at a density of 17 units per acre, as well as associated open space, circulation and parking, infrastructure, soil remediation, and grading improvements. In addition, two options for the future Blomquist Street Extension are considered, including the Partial Blomquist Street Extension to Maple Street (i.e., the “proposed project”) and the Partial Blomquist Street Extension to Redwood Creek (i.e., the “proposed project variant”). The potential environmental effects of implementing the proposed project are analyzed in Chapter IV, Setting, Impacts, and Mitigation Measures. The proposed project has been described and analyzed in the previous chapters with an emphasis on determining and evaluating potential significant impacts resulting from the project and identifying mitigation measures to avoid or reduce these impacts to a less-than-significant level. The following identifies and discusses two feasible alternatives to the proposed project, compares the impacts of each alternative to the impacts of the project, and determines whether the alternatives meet the project objectives.

The two alternatives to the proposed project that are discussed in this chapter are:

- The **No Project alternative**, which assumes the continuation of existing conditions within the project site. No new residential uses would be constructed, no existing buildings would be demolished, and no improvements would be made to existing infrastructure.
- The **Reduced Development alternative**, which assumes redevelopment of the site with a 92-unit residential townhome community, with similar open space, circulation and parking, infrastructure, soil remediation, and grading improvements as proposed by the project.

These alternatives represent a reasonable range of potential alternatives to the proposed project in light of the objective of reducing or avoiding environmental impacts identified in this EIR. Several other potential alternatives were also considered, as discussed later in this chapter; however, none of these alternatives would substantially reduce or avoid the environmental impacts of the proposed project or the project variant and/or would not meet many of the basic project objectives and were therefore ultimately not selected for further analysis.

Project objectives are identified in Chapter III, Project Description. To assist in evaluating project alternatives, the objectives are repeated below:

- Develop a townhome community on the waterfront that will appeal to prospective homeowners in the housing constrained and jobs rich San Francisco Peninsula;
- Create a community on a site that offers both proximity to the water in addition to accessibility to the strongest job markets in the nation in Silicon Valley and San Francisco;
- Increase the affordable housing supply by contributing fees in compliance with the City's Affordable Housing Ordinance;
- Develop a community that includes quality architecture, landscape, and streetscape to capitalize on "placemaking" features that define Redwood City's harbor;
- Activate and beautify the waterfront by creating key public recreation amenities via the Bay Trail. Help the City prioritize the waterfront for public-oriented and water-dependent uses and activities;
- Accommodate educational use amenities along the Bay Trail that invite hands-on learning experiences that feature the history and ecology of Redwood City;
- Contribute to a pedestrian and bike recreational thoroughfare connecting Downtown Redwood City to the waterfront that addresses circulation, visual, and aesthetic concerns;
- Provide housing at a scale and density appropriate to the project site and sufficient to support the creation of public waterfront amenities;
- Provide a blend of habitat, recreational, and residential uses within the harbor area;
- Preserve potential historical resources via relocation of the existing water tank to adjacent City-owned property;
- Fortify the site against future sea level rise by raising the site significantly;
- Mitigate lead in soil and volatile organic compounds (VOCs) in soil gas as part of project construction; and
- Mitigate environmental hazards on the site as identified by soils investigations.

The purpose of this discussion of alternatives to the project is to enable decision-makers to evaluate the project by considering how alternatives to the project as proposed might reduce or avoid the project's impacts on the physical environment. The analysis in this chapter provides a qualitative evaluation of the environmental impacts that could be associated with each alternative and compares those potential impacts to those identified for both the proposed project and the project variant as described in Chapter IV of this EIR.

If City decision-makers were to decide to move forward with the Reduced Development alternative as identified in this chapter, additional site planning and design work and analysis would be required for the environmental impacts associated with this alternative, and specific mitigation measures for each potentially significant impact would need to be developed and considered.

A. NO PROJECT ALTERNATIVE

The following provides a description of the No Project alternative and its anticipated environmental impacts. The emphasis of the analysis is on comparing the anticipated environmental impacts of the

No Project alternative to the environmental impacts associated with the proposed project. The discussion includes a determination of whether or not the No Project alternative would reduce, eliminate, or create new significant environmental impacts and would or would not meet the objectives of the project.

1. Principal Characteristics

The No Project alternative assumes that neither the proposed project nor the project variant would be developed and that the project site would generally remain in its current condition. The project site would continue to be occupied by and used for site maintenance activities, marina-related storage, diesel engine repair, and marina operations. The existing water tank would remain in its current location.

2. Analysis of the No Project Alternative

The potential impacts associated with the No Project alternative are described below. As discussed, the No Project alternative would reduce or avoid all of the significant impacts of the proposed project and the project variant. However, the No Project alternative would also not achieve any of the objectives of the proposed project.

a. Land Use and Planning. The No Project alternative would result in the continuation of existing conditions at the project site and no discretionary actions by the City would be required. The site would remain zoned as Tidal Plain, which prohibits development. This alternative would not disrupt or divide the physical arrangement of an established community and no new land uses would be introduced to the project site. The existing buildings on the project site would remain and would continue to operate with the same, or similar, uses. No improvements would be made to the waterfront. Overall, implementation of the No Project alternative would not result in redevelopment of an underutilized site within the City. Similar to the proposed project, the No Project alternative would not result in any significant impacts related to land use and planning.

b. Biological Resources. Under the No Project alternative, the project site would not be redeveloped and no existing trees or drainage areas would be disturbed. Additionally, no work within Redwood Creek would occur. Impacts to biological resources identified for development of the proposed project and the project variant would not occur. Specifically, impacts to protected birds, special status species, and federally-protected wetlands would not result from implementation of the No Project alternative and implementation of Mitigation Measures BIO-1, BIO-2, BIO-3, and BIO-4 would not be required. Similar to the proposed project, there would be no impacts related to local policies protecting biological resources or any adopted habitat conservation plans or adopted natural community conservation plans. Ultimately, implementation of the No Project alternative would avoid all impacts to biological resources associated with development of the proposed project.

c. Cultural Resources. Under the No Project alternative, the project site would not be redeveloped and no construction activities, including grading and excavation, would occur. The existing water tank on the site would not be relocated and would remain in its current location and implementation of Mitigation Measure CUL-1 would not be required. Potential impacts to archaeological resources that may be located at the project site would not occur because no ground disturbing or construction activities would take place; therefore, implementation of Mitigation Measure CUL-2 would not be required. Likewise, no unidentified paleontological resources or Native

American skeletal remains would have the possibility of being disturbed. Ultimately, implementation of the No Project alternative would avoid all impacts to cultural resources associated with development of the proposed project.

d. Transportation and Circulation. The transportation network within, and in the vicinity of, the project site would remain unchanged with the No Project alternative. The No Project alternative would not result in the dedication of land for construction of any portion of the Blomquist Street Extension, although it is assumed that this City-planned roadway improvement would occur in the Cumulative condition. Under the No Project alternative, no new bicycle facilities and no bicycle parking would be provided on the project site. Improvements to pedestrian circulation, particularly those that would occur as part of the proposed Bay Trail segment that would be constructed by the project, also would not occur.

Because no development would occur on the site, impacts identified for the proposed project related to transportation and circulation during Existing and Cumulative Plus Project conditions would not occur. Specifically, the less than significant project impacts associated with increased vehicle delay at the intersections of Broadway/Woodside Road (SR 84)/US 101 Southbound Off-Ramp (Intersection #6) during Existing Plus Project and Cumulative Plus Project conditions and the Blomquist Street/Seaport Boulevard/East Bayshore Road (Intersection #8) during Cumulative Plus Project conditions would not occur and implementation of Mitigation Measures TRA-1, TRA-3, and TRA-4 would not be required.

Less-than-significant project-related impacts to traffic hazards, air traffic patterns, public transit, pedestrian and bicycle facilities, and emergency vehicle access and circulation would also not occur with implementation of the No Project alternative. Construction-related impacts identified for the proposed project that would cause temporary congestion at area intersections also would not occur and Mitigation Measure TRA-2 would also not be required. As such, none of the mitigation measures identified for implementation of the proposed project or project variant would be required with the No Project alternative. Ultimately, implementation of the No Project alternative would avoid all impacts related to transportation and circulation associated with development of the proposed project.

e. Air Quality. Under the No Project alternative, construction activities at the project site would not occur and the potentially significant impact associated with construction-period air quality emissions would not result; therefore, implementation of Mitigation Measure AIR-1 would not be required. Additionally, the No Project alternative would not introduce any new residential uses to the project site; therefore, Mitigation Measure AIR-2 would also not be required. The less-than-significant impacts related to consistency with the Bay Area Air Quality Management District's (BAAQMD) Clean Air Plan, local and regional operation-period air emission associated with vehicle trips, substantial pollutant concentrations that could affect sensitive receptors, and odors would also not occur with implementation of the No Project alternative. Ultimately, implementation of the No Project alternative would avoid all impacts related to air quality associated with development of the proposed project.

f. Noise. Under the No Project alternative, no construction activities would occur on the site and no noise impacts associated with the location of residential uses in an area that is generally considered an unacceptable noise environment for residential land uses would occur. Therefore, implementation of Mitigation Measures NOI-1 and NOI-2 would not be required. In addition the less-than-significant

noise-related impacts associated with the construction and operation of the proposed project would not occur with implementation of the No Project alternative. Similar to the proposed project, no groundborne vibration or noise impacts would occur. Ultimately, implementation of the No Project alternative would avoid all impacts related to noise associated with development of the proposed project.

g. Hazards and Hazardous Materials. Under the No Project alternative, the project site would not be redeveloped and would remain in its current condition and no construction or soil remediation activities would take place; therefore, impacts associated with the potential release of or exposure to hazardous materials would not occur and implementation of Mitigation Measures HAZ-1, HAZ-2, and HAZ-3 would not be required. However, under this alternative, existing hazardous conditions at the site would not be remediated and underlying soils and groundwater would continue to be contaminated. The less-than-significant impacts related to the routine transport use, or disposal of hazardous materials, acutely hazardous materials near sensitive receptors, hazardous materials within a quarter mile of a school, emergency access and evacuation routes, and aviation hazards would also not occur with implementation of the No Project alternative.

Ultimately, implementation of the No Project alternative would avoid all impacts related to hazardous materials associated with development of the proposed project, although existing hazardous conditions at the site would continue because the site would not be remediated.

h. Hydrology and Water Quality. Under the No Project alternative, the project site would be subject to existing hydrologic conditions and would remain entirely covered in impervious surfaces. The elevation of the site would not be raised and the site would continue to be subject to periodic flooding. Under the No Project alternative, the proposed project's significant impacts associated with contaminated soil or contaminated imported fill, erosion and siltation along Redwood Creek, alteration of existing drainage patterns, on- and off-site flooding, and flood flows within 100-year flood zones would not occur. Therefore implementation of Mitigation Measures HYD-1, HYD-2, HYD-3, HYD-4, and HYD-5 would not be required. In addition, the less-than-significant impacts related to groundwater resources, stormwater drainage systems and runoff, housing flood zones, other water quality degradation, and inundation by seiche, tsunami, or mudflow would not occur. Similar to the proposed project, there would be no impact associated with flood hazards from levees or dams under the No Project alternative.

Ultimately, implementation of the No Project alternative would avoid all impacts related to hydrology and water quality associated with development of the proposed project, although existing flooding conditions at the site would continue because no improvements would be made to raise the site's elevation.

i. Utilities and Service Systems. Under the No Project alternative, the project site would not be redeveloped and would remain in its current condition. No new connections to existing utility infrastructure would be required and no new infrastructure would be expanded onto the project site. No increase in the demand for water, wastewater, solid waste collection and disposal, or electricity services would result. The less-than-significant project impacts associated with the provision of water supplies and adequate water, wastewater, solid waste, and energy infrastructure and services would not result with implementation of the No Project alternative. Overall, implementation of the No

Project alternative would not increase the demand for services, and the less than significant impacts to utilities and service systems would be reduced when compared to the proposed project.

B. REDUCED DEVELOPMENT ALTERNATIVE

The following provides a description of the Reduced Development alternative and its anticipated environmental impacts. The emphasis of the analysis is on comparing the anticipated environmental impacts of the Reduced Development alternative to the environmental impacts associated with the proposed project. The discussion includes a determination of whether or not the Reduced Development alternative would reduce, eliminate, or create new significant environmental impacts and would or would not meet the objectives of the project.

1. Principal Characteristics

Similar to the proposed project, the Reduced Development alternative would result in redevelopment of the site with a residential townhome community. However, the total number of units would be reduced to 92 units. Buildings M, H, G, and F would not be developed and a portion of these areas would instead be developed with open space consisting of a public park. In addition, Buildings I and E would also not be developed and the existing water tank would be retained on site and additional open space and landscaping would be developed around this structure. The elimination of these buildings would result in a reduction of 39 units (or approximately 30 percent) compared to the proposed project.

All other improvements proposed as part of the project and project variant would generally occur under this alternative, including open space, circulation and parking, infrastructure, soil remediation, and grading improvements. The partial extension of Blomquist Street to Maple Street or Redwood Creek, as contemplated by the proposed project and the project variant would also occur under this alternative as secondary access to the site would still be required per Fire Code requirements and because the extension of Blomquist Street to East Bayshore Road is already planned by the City independently of the proposed project. Some on-site guest parking along the newly reconstructed Maple Street would also be eliminated as fewer parking spaces would be required for the reduced number of residential units, per City requirements. These areas could also be developed with additional open space. Requested discretionary actions would also be similar to the proposed project, including the proposed Development Agreement modified as necessary, the Zoning Map and Text Amendment, Vesting Tentative Map, Use Permit, and Sign Permit.

2. Analysis of the Reduced Development Alternative

The potential impacts associated with the Reduced Development alternative are described below. As discussed, the Reduced Development alternative would reduce the overall footprint of development as compared to the proposed project, resulting in reduced impacts related to biological resources, cultural resources, transportation and circulation, air quality, noise, hydrology and water quality, and utilities and service systems as compared to the proposed project. Impacts related to hazardous materials would generally be the same as the proposed project. Impacts to historic resources would be avoided with implementation of the Reduced Development alternative because the existing water tank would be retained on site.

The Reduced Development alternative would achieve all of the project objectives, although not to the same extent as the proposed project given that the number of residential units would be reduced. The Reduced Development alternative would result in a lower contribution of affordable housing fees to the City, reducing the project's contribution to the affordable housing supply. The project's contribution to public waterfront amenities may also be diminished as the scale and density of housing proposed under this alternative may not be sufficient to fund all of the improvements to the Bay Trail and open space areas as compared to the proposed project.

Historic resources would be preserved on-site rather than off-site, because the existing water tank would remain in its current location and would not be dismantled and relocated; therefore, this objective of the project would be met with implementation of the Reduced Development alternative.

a. Land Use and Planning. The Reduced Development alternative would result in redevelopment of the project site with a residential townhome community, similar to the proposed project, although at a lesser scale. The discretionary actions requested for the proposed project would also be similar, including rezoning of the site to the newly created Mixed Use Waterfront District. Similar to the proposed project, the Reduced Development alternative would not result in the disruption or division of the physical arrangement of an established community and instead would provide new connections to the City's waterfront areas. Similar to the proposed project, the Reduced Development alternative would not result in any significant impacts related to land use and planning. Overall, implementation of the No Project alternative would result in redevelopment of an underutilized site within the City, although at a reduced scale as compared to the proposed project.

b. Biological Resources. Under the Reduced Development alternative, several buildings proposed as part of the project would not be constructed, reducing the overall footprint of development on the site. Fewer trees would be removed from the site and one of the on-site drainages (Wetland Ditch 2) would be avoided, reducing the project's impacts to wetland areas by 0.056 acres. Work within Redwood Creek would still occur in order to construct the improvements related to the Bay Trail and to raise the elevation of the site in response to future sea level rise projections.

Impacts to biological resources identified for development of the proposed project and the project variant would be similar. Specifically, impacts to protected birds and special status species would occur with development of the Reduced Development alternative, and implementation of Mitigation Measures BIO-1, BIO-2, and BIO-3 would be required. Although this alternative would avoid permanent impacts to one wetland area on the site, impacts to the other two wetland areas (Wetland Ditches 1 and 3) would still occur as these wetlands are located within the areas of the Partial Blomquist Street Extension to Maple Street. Due to the unique site configuration and location of the current terminus of Blomquist Street, it does not appear feasible to relocate the planned alignment of this roadway. Therefore, although impacts to federally-protected wetlands would be reduced compared to the proposed project, implementation of Mitigation Measure BIO-4 would still be required. Similar to the proposed project, there would be no impacts related to local policies protecting biological resources or any adopted habitat conservation plans or adopted natural community conservation plans.

Ultimately, implementation of the Reduced Development alternative would not avoid, but instead would slightly reduce impacts to biological resources as compared to the proposed project due to the reduced development footprint.

c. Cultural Resources. Under the Reduced Development alternative, several buildings proposed as part of the project would not be constructed, reducing the overall footprint of development on the site. Specifically, the buildings currently proposed to be located within the existing location of the water tank, which qualifies as a historic resource under CEQA, would not be constructed and the existing water tank would remain in its current location. Therefore, implementation of Mitigation Measure CUL-1 would not be required. Because construction activities would still occur on the site, similar the proposed project, potential impacts to archaeological resources that may be located at the project site could also occur; therefore, implementation of Mitigation Measure CUL-2 would be required. Likewise, unidentified paleontological resources and Native American skeletal remains could also be disturbed and the construction contractor would be required to follow all protocols and regulations related to accidental discovery of these resources.

Ultimately, implementation of the Reduced Development alternative would avoid impacts to historic resources and would slightly reduce the less-than-significant impacts to archaeological and paleontological resources and human remains associated with the proposed project due to the reduced development footprint.

d. Transportation and Circulation. Similar to the proposed project, the transportation network within, and in the vicinity of, the project site would be modified with development of the Reduced Development alternative. Because the study intersections that would be adversely affected by development of the proposed project are already operating at poor levels of service, nearly any additional traffic at these intersections would likely increase the vehicle delay beyond the City's established thresholds. Therefore, similar to the proposed project, the Reduced Development alternative would result in a less than significant impact associated with increased vehicle delay at the intersections of Broadway/Woodside Road (SR 84)/US 101 Southbound Off-Ramp (Intersection #6) during Existing Plus Project and Cumulative Plus Project conditions and the Blomquist Street/Seaport Boulevard/East Bayshore Road (Intersection #8) during Cumulative Plus Project conditions with implementation of Mitigation Measures TRA-1, TRA-3, and TRA-4.

Less-than-significant project-related impacts to traffic hazards, air traffic patterns, public transit, pedestrian and bicycle facilities, and emergency vehicle access and circulation would also occur with implementation of the Reduced Development alternative. Construction-related impacts identified for the proposed project that would cause temporary congestion at area intersections also would occur and Mitigation Measure TRA-2 would also be required.

Ultimately, implementation of the Reduced Development alternative would slightly reduce the less-than-significant impacts related to transportation and circulation associated with the proposed project due to the reduced number of residential units and associated reduction in vehicle trips.

e. Air Quality. Under the Reduced Development alternative, construction activities at the project site would still occur, although the overall length and duration may be reduced; however, the potentially significant impact associated with construction-period air quality emissions would be similar; therefore, implementation of Mitigation Measure AIR-1 would be required. Additionally, the Reduced Development alternative would introduce new residential uses to the project site; therefore, Mitigation Measure AIR-2 would also be required. The less-than-significant impacts related to consistency with the Bay Area Air Quality Management District's (BAAQMD) Clean Air Plan, local and regional operation-period air emission associated with vehicle trips, substantial pollutant

concentrations that could affect sensitive receptors, and odors would also occur with implementation of the Reduced Development alternative. Ultimately, implementation of the Reduced Development alternative would slightly reduce impacts related to air quality associated with development of the proposed project due to the reduced level of development.

f. Noise. Under the Reduced Development alternative, construction activities would occur on the site, although the overall length and duration may be reduced. In addition, noise impacts associated with the location of residential uses in an area that is generally considered an unacceptable noise environment for residential land uses would also still occur. Therefore, implementation of Mitigation Measures NOI-1 and NOI-2 would be required. In addition the less-than-significant noise-related impacts associated with the construction and operation of the proposed project would also occur with implementation of the Reduced Development alternative and, similar to the proposed project, no groundborne vibration or noise impacts would occur. Ultimately, implementation of the Reduced Development alternative would slightly reduce impacts related to noise associated with development of the proposed project due to the reduced level of development.

g. Hazards and Hazardous Materials. Under the Reduced Development alternative, the project site would be redeveloped and construction and soil remediation activities would take place, similar to the proposed project; therefore, impacts associated with the potential release of or exposure to hazardous materials would be similar to the proposed project and implementation of Mitigation Measures HAZ-1, HAZ-2, and HAZ-3 would be required. The less-than-significant impacts related to the routine transport use, or disposal of hazardous materials, acutely hazardous materials near sensitive receptors, hazardous materials within a quarter mile of a school, emergency access and evacuation routes, and aviation hazards would also occur with implementation of the Reduced Development alternative. Ultimately, implementation of the Reduced Development alternative would result in similar impacts related to hazards and hazardous materials as those associated with the proposed project.

h. Hydrology and Water Quality. Under the Reduced Development alternative, hydrologic conditions at the project site would change, similar to the proposed project, although the overall total area of pervious surfaces would increase compared to the proposed project due to the increase in proposed open space areas and reduced development footprint. The elevation of the site would also be required to be raised. Under the Reduced Development alternative, the proposed project's significant impacts associated with contaminated soil or contaminated imported fill, erosion and siltation along Redwood Creek, alteration of existing drainage patterns, on- and off-site flooding, and flood flows within 100-year flood zones would still occur. Therefore implementation of Mitigation Measures HYD-1, HYD-2, HYD-3, HYD-4, and HYD-5 would be required. In addition, the less-than-significant impacts related to groundwater resources, stormwater drainage systems and runoff, housing flood zones, other water quality degradation, and inundation by seiche, tsunami, or mudflow would occur. Similar to the proposed project, there would be no impact associated with flood hazards from levees or dams under the Reduced Development alternative. Ultimately, implementation of the Reduced Development alternative would slightly reduce impacts related to hydrology and water quality associated with development of the proposed project due to the reduced level of development.

i. Utilities and Service Systems. Under the Reduced Development alternative, new connections to existing utility infrastructure would be required and new infrastructure would be expanded onto the project site to accommodate the new townhome community, similar to the proposed project.

Increased demand for water, wastewater, solid waste collection and disposal, and electricity services would result with the Reduced Development alternative, although to a lesser extent than the proposed project. The less-than-significant project impacts associated with the provision of water supplies and adequate water, wastewater, solid waste, and energy infrastructure and services would result with implementation of the Reduced Development alternative. Ultimately, implementation of the Reduced Development alternative would slightly reduce impacts related to utilities and services systems associated with development of the proposed project due to the reduced level of development and resulting reduced demand for services as compared to the proposed project.

C. OTHER ALTERNATIVES CONSIDERED

During the Notice of Preparation comment period, the City received verbal suggestions for the identification and evaluation of alternatives to the proposed project at the scoping hearing (see Appendix A of this EIR). The following provides a description of various potential alternatives that were identified and considered, and the reasons why they were ultimately not selected for further evaluation in this EIR.

- **Off-Site Locations.** An alternative location was not considered for analysis because the applicant does not own or would not feasibly otherwise be able to gain control of a suitable vacant site within the City. In addition, major objectives of the project include development of a townhome community within proximity to the water, with associated public improvements to the waterfront. An alternative location that does not include a portion of the waterfront would fail to meet several objectives of the project. Therefore, such an alternative was ultimately not selected for further analysis in the EIR.
- **Reduced Building Heights.** An alternative was considered that would reduce the overall building heights on the project site from three to two stories. Such an alternative would require that each building include either a ground floor garage area with one level of residential use above or two levels of residential uses with an attached garage adjacent to the residential building. The first configuration would result in smaller unit sizes and the latter configuration would likely reduce the number of units on the site by approximately 50 percent. In either case, an alternative that would reduce the overall massing and scale of the proposed buildings would result in a redesign of the proposed site plan but would not substantially reduce or avoid any impacts of the project as identified in this EIR. As discussed in the Initial Study included in Appendix B, impacts of the proposed project related to visual resources would already be less than significant. Therefore, such an alternative was ultimately not selected for further analysis in the EIR.
- **Additional Reduction in Residential Development.** The Reduced Development alternative discussed above addresses a potential reduced development scenario of approximately 30 percent fewer residential units with the objective of reducing or avoiding already less-than-significant project impacts related to biological resources and historic resources. Additional reductions in the total number of units on the site would not further reduce or avoid any additional impacts of the project as most project impacts are related to construction activities. As discussed above, because study area intersections that would be adversely affected by the proposed project are already operating at unacceptable levels of service, nearly any amount of development on the site would result in similar intersection

delays and associated level of service impacts as those identified for the proposed project. Therefore, such an alternative was ultimately not selected for further analysis in the EIR.

- **Redevelopment with Office or Commercial Uses.** An alternative was considered that would result in redevelopment of the site with office or commercial uses, rather than residential uses. However, such an alternative would also require a zoning change on the site to allow this type of development. In addition, such an alternative would not substantially reduce or avoid any impacts of the project as most impacts are related to construction activities and, as discussed above, the transportation impacts related to increased intersection delay would likely occur with any amount or type of development on the site. Furthermore, such an alternative would not meet any of the project objectives related to housing. Therefore, such an alternative was ultimately not selected for further analysis in the EIR.
- **Affordable Housing.** An alternative was considered that would result in the same development pattern as proposed by the project but all residential units would be affordable to low-income residents rather than market-rate. While the developer could choose to provide a 100 percent affordable housing project on the site, such an alternative would not reduce or avoid any impacts of the project as identified in this EIR. In addition, the site is not designated as an affordable housing site in any adopted planning or policy document. Furthermore, as one of the project objectives, the project would contribute fees in compliance with the City's Affordable Housing Ordinance. Therefore, such an alternative was ultimately not selected for further analysis in the EIR.
- **Reduced Parking.** A reduced parking alternative, in which the number of on-site parking spaces would be reduced, was also considered. As discussed in Section IV.D, Transportation and Circulation, the Redwood City Ordinance requires a minimum of two off-street parking spaces per multiple family dwelling unit, one of which must be a covered space. Additionally there must be one guest or visitor parking space for every four units. These requirements are met for the proposed project as there are 131 dwelling units and 262 off-street parking spaces proposed. Additionally there is a minimum of 33 guest and visitor parking spaces required for the 131 units, which is satisfied by the proposed 35 on-street parking spaces. A reduction in the number of parking spaces on the site would not comply with the City's parking requirements and also would not reduce or avoid any impacts of the project as identified in this EIR. Therefore, such an alternative was ultimately not selected for further analysis in the EIR.

D. ENVIRONMENTALLY SUPERIOR ALTERNATIVE

CEQA requires the identification of the environmentally superior alternative in an EIR from among the range of reasonable alternatives that are evaluated. For this project, the No Project alternative would be considered the environmentally superior alternative as environmental impacts associated with the project would be reduced or avoided under this alternative. However, this alternative does not meet the objectives of the proposed project.

CEQA Guidelines Section 15126.6(d)(2) states that if the environmentally superior alternative is the No Project alternative, the EIR shall also identify an environmentally superior alternative from among the other alternatives. When compared to the proposed project, the Reduced Development alternative

would be considered the environmentally superior alternative because this alternative would result in an overall smaller development footprint and a shorter construction period. Therefore, project impacts would be slightly reduced when compared to the proposed project, although all but one impact of the project (Impact CUL-1) would still occur. In addition, development of this alternative would meet all of the project objectives, although some to a lesser degree.

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