City of Pinole
Community Development Department

Pinole Square Project

Initial Study/Mitigated Negative Declaration

February 2020

Prepared by

RANEY PLANNING & MANAGEMENT, INC.
1501 Sports Drive, Suite A, Sacramento, CA 95834

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APPENDICES:

INITIAL STUDY

February 2020

A. BACKGROUND

1.	Project Title:	Pinole Square Project
2.	Lead Agency Name and Address:	City of Pinole Community Development Department 2131 Pear Street Pinole, CA 95760
3.	Contact Person and Phone Number:	Amalia M. Merino Project Planner (510) 724-9000
4.	Project Location:	1201-1577 Tara Hills Drive Pinole, CA 94564 Assessor's Parcel Numbers: 402-282-014-8, 402-282-013-0, 402-282-026-2, 402-282-027-0, 402-282-028-8, 402-282-010-6, 402-282-009-8, 402-282-008 402-282-007-2, 402-282-006-4, 402-282-016-3
5.	Project Applicant's Name and Address:	Carl Goldstone Hillsboro Properties, Inc. 1300 S. El Camino Real, #525 San Mateo, CA 94406
6.	Existing General Plan Designation:	Appian Way Service Sub-Area
7.	Existing Specific Plan Designation:	Commercial Mixed Use, High Density Residential Overlay (CMU-HDRO)
8.	Existing Zoning Designation:	CMU-HDRO

9. Surrounding Land Uses and Setting:

The project site consists of approximately 11.89 acres located at 1201-1577 Tara Hills Drive in the City of Pinole, California. The site is identified by Assessor's Parcel Number (APN) 402-282-014-8, 402-282-013-0, 402-282-026-2, 402-282-027-0, 402-282-028-8, 402-282-010-6, 402-282-009-8, 402-282-007-2, 402-282-006-4, 402-282-016-3. In addition, 402-282-008 is owned by a different property owner than the applicant. The applicant is to request and provide a letter of authorization from the 402-282-008 parcel owner authorizing Hillsboro Properties, Inc. to reface the facades of portions of the existing shops as part of the proposed project. Currently, the site is developed with the Appian 80 Shopping Center, which includes a Safeway grocery store, a vacant CVS pharmacy, and various other smaller businesses. Per the Three Corridors Specific Plan, the project site is located within the Service Sub-Area of the Appian Way Specific Plan area. The Specific Plan designates the site Commercial Mixed Use with a High Density Residential Overlay (CMU-HDRO), consistent with the site's zoning designation.

Surrounding land uses include a shopping center to the north, across Tara Hills Drive, a medical office building (Bay Area Laser Cosmetic Surgery Center) to the east, southwest of the Tara Hills Drive/Appian Way intersection, and a single-family residential neighborhood to the west. Interstate 80 (I-80) is located approximately 150 feet to the south of the site.

10. Project Description Summary:

The proposed project would include demolition of the existing building housing the Safeway grocery store and vacant CVS pharmacy, the car wash and antique restoration store buildings located within the western portion of the site, and a portion of the existing building housing the former O'Reilly Wheel Works and Pizza Hut. The existing China Delight restaurant building, the dry cleaner/fitness studio/seafood, and barbeque restaurant/former Chase Bank buildings located within the eastern portion of the site would remain. New structures would be constructed on-site, including, but not limited to, a Safeway fuel station and associated kiosk, a drive-through restaurant, a casual sit-down restaurant and new building space to house the Safeway grocery store and other shops. Required entitlements for the project would include approval of a Specific Plan Amendment, Comprehensive Design Review, two Variances (Variance for Safeway Fuel Station Proximity to Nearest Chevron Station on Appian and Tara Hills Drive and Variance for Wood instead of Masonry Fence between Different Land Uses), eight Conditional Use Permits (New Safeway Store Alcohol Sales, Outdoor Merchandise Sales Safeway, Commercial Pad Drive Through [Pad 3], Outdoor Dining In Line Shop Space, Outdoor Dining Pad 1, Reduced Parking, New Safeway Fuel Kiosk Alcohol Sales, and Automobile Service Station), and an One Lot Parcel Map. A Sign Program will be applied for separately.

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

In compliance with Assembly Bill (AB) 52 (Public Resources Code Section 21080.3.1), a project notification letter was distributed to the Amah Mutsun Tribal Band, the Amah Mutsun Tribal Band of Mission San Juan Bautista, the Indian Canyon Mutsun Band of Costanoan, the Muwekma Ohlone Indian Tribe of the SF Bay Area, the North Valley Yokuts Tribe, and the Ohlone Indian Tribe. Three of the tribes provided responses within the 30-day response period, which ended July 31, 2019; however, none of the tribes requested initiation of formal consultation. The Ohlone Indian Tribe requested from the City the depth of any planned excavations. The City will provide this information upon receipt from the applicant.

B. SOURCES

All of the technical reports and modeling results used for the project analysis are available upon request at the City of Pinole Development Services Department, located at 2131 Pear Street, Pinole. City Hall public hours are Monday through Thursday, 8:00 AM to 4:30PM and closed for lunch 12:00-1:00 PM. The following documents are referenced information sources used for the purposes of this Initial Study:

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

Bay Area Air Quality Management District. *Recommended Methods for Screening and Modeling Local Risks and Hazards*. May 2012.

Bollard Acoustical Consultants, Inc. *Changes in noise levels associated with revised building square footages for the proposed Pinole Square Redevelopment project in Pinole, California*. February 18, 2020.

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California Air Pollution Control Officers Association. *Quantifying Greenhouse Gas Mitigation Measures.* August 2010.

California Air Resources Board. *The 2017 Climate Change Scoping Plan Update.* November 2017.

California Air Resources Board. *User Manual for the Hotspots Analysis and Reporting Program Health Risk Assessment Standalone Tool, Version 2*. March 17, 2015.

California Building Standards Commission. *California Green Building Standards Code*. 2019.

California Department of Conservation. *California Important Farmland Finder.* Available at: https://maps.conservation.ca.gov/DLRP/CIFF/. Accessed September 2019.

California Department of Forestry and Fire Protection. *Contra Costa County Fire Hazard Severity Zones in SRA.* November 7, 2007.

California Department of Resources Recycling and Recovery (CalRecycle). *Facility/Site Summary Details: Keller Canyon Landfill (07-AA-0032)*. Available at: https://www2.calrecycle.ca.gov/swfacilities/Directory/07-AA-0032/. Accessed September 2019.

California Department of Transportation. *Scenic Highways.* Available at: https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways. Accessed September 2019.

City of Pinole. *2015-2023 Housing Element.* Adopted May 19, 2015.

City of Pinole. *General Plan Update Draft Environmental Impact Report, SCH #2009022057.* July 2010.

City of Pinole. *General Plan Update.* November 2010.

City of Pinole. *Three Corridors Specific Plan.* May 2010.

Contra Costa County Clean Water Program. *Stormwater C.3 Guidebook.* May 17, 2017.

Cornerstone Earth Group. *Additional Soil, Soil Vapor, and Groundwater Quality Evaluation, Pinole Square, 1211 to 1501 Tara Hills Drive, Pinole, California.* August 30, 2019.

Cornerstone Earth Group. *Design-Level Geotechnical Investigation, Pinole Square Shopping Center, 1421 Tara Hills Drive, Pinole, California.* October 31, 2019.

Cornerstone Earth Group. *Pinole Square Shopping Center, Supplemental Information on Environmental Conditions*. November 20, 2019.

Cornerstone Earth Group. *Phase I Environmental Site Assessment Update and Preliminary Soil Vapor Quality Evaluation, Appian 80 Shopping Center, 1201 to 1577 Tara Hills Drive, Pinole, California.* June 27, 2019.

East Bay Municipal Utility District. *Urban Water Management Plan*. July, 2015.

Federal Emergency Management Agency. *Flood Insurance Rate Map 06013C0231G.* Effective March 21, 2017.

Flores, Areana. Environmental Planner, Planning and Climate Protection. Personal communication [phone] with Jacob Byrne, Senior Associate/Air Quality Technician, Raney Planning and Management, Inc. September 17, 2019.

HortScience, Inc. *Arborist Report, Pinole Square, CA.* October 2017.

Native American Heritage Commission. *Pinole Square Project, City of Pinole; Richmond USGS Quadrangle, Contra Costa County, California.* July 30, 2019.

Northwestern Information Center. *Record search results for the proposed Pinole Square Project at 1200-1577 Tara Hills Drive, Pinole, CA.* August 20, 2019.

Office of Environmental Health Hazard Assessment. *Air Toxics Hot Spots Program Risk Assessment Guidelines, Guidance Manual for Preparation of Health Risk Assessments*. February 2015.

Office of Planning and Research. *Technical Advisory on Evaluating Transportation Impacts in CEQA.* December 2018.

San Joaquin Valley Air Pollution Control District. *Guidance for Air Dispersion Modeling*. August 2006.

TJKM. *Pinole Square, Transportation Impact Study.* February 21, 2020.

TJKM. *Technical Memorandum, Pinole Square Traffic Study.* January 2, 2020.

U.S. Environmental Protection Agency. *User's Guide for the AMS/EPA Regulatory Model – AERMOD*. September 2004.

C. ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

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

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

D. DETERMINATION

On the basis of this initial study:

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

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

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

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

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

______________________________	______________________________
Signature	Date
David Hanham, Planning Manager	City of Pinole
Printed Name	For

E. BACKGROUND AND INTRODUCTION

This Initial Study/Mitigated Negative Declaration (IS/MND) identifies and analyzes the potential environmental impacts of the Pinole Square Project (proposed project). The information and analysis presented in this document is organized in accordance with the order of the California Environmental Quality Act (CEQA) checklist in Appendix G of the CEQA Guidelines. Where the analysis provided in this document identifies potentially significant environmental effects of the project, mitigation measures are prescribed sufficient to reduce all impacts to a less-than-significant level.

The mitigation measures prescribed for environmental effects described in this IS/MND would be implemented in conjunction with the project, as required by CEQA. The mitigation measures would be incorporated into the project through conditions of approval. The City would adopt findings and a Mitigation Monitoring/Reporting Program for the project in conjunction with approval of the project.

On October 10, 2010, the City of Pinole adopted a comprehensive update to the City's General Plan,[1] along with the Three Corridors Specific Plan (Specific Plan).[2] The purpose of the Specific Plan is to facilitate revitalization of the San Pablo Avenue, Pinole Valley Road, and Appian Way commercial corridors. In September of 2010, the City certified an associated Environmental Impact Report (EIR) that analyzed the potential environmental impacts associated with buildout of both the General Plan and Specific Plan.[3] The City of Pinole General Plan EIR was prepared as a program-level EIR, pursuant to Section 15168 of the CEQA Guidelines (Title 14, California Code of Regulations, Sections 15000 et seq.). The City of Pinole General Plan EIR identified measures to mitigate the significant adverse impacts associated with the implementation of the General Plan and Specific Plan. Pursuant to CEQA Guidelines Section 15150, this IS/MND incorporates by reference the analysis contained within the General Plan EIR.

Per the Specific Plan, the project site is located within the Service Sub-Area of the Appian Way Specific Plan area. The Specific Plan designates the site CMU-HDRO. Per the Specific Plan, the CMU designation is designed to provide for the integration of retail and service commercial uses with office and/or residential uses; a minimum of 51 percent of all on-site uses must be commercial. Per a January 28, 2019 Joint Session, the City Council and Planning Commission determined that housing is not required on the project site under the site's current land use and zoning designations. The City meets the latest Regional Housing Needs Allocation (RHNA) housing allotments without the 125 residential units previously identified for the project site per the City's Housing Element.[4]

F. PROJECT DESCRIPTION

The following provides a description of the project site's current location and setting, as well as the proposed project components and the discretionary actions required.

Project Location and Setting

The project site consists of approximately 11.89 acres located at 1201-1577 Tara Hills Drive in the City of Pinole, California (see Figure 1 and Figure 2).

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1 City of Pinole. *General Plan Update.* November 2010.
2 City of Pinole. *Three Corridors Specific Plan.* May 2010.
3 City of Pinole. *General Plan Update Draft Environmental Impact Report, SCH #2009022057.* July 2010.
4 City of Pinole. *2015-2023 Housing Element [Table 6.44].* Adopted May 19, 2015.

Figure 1
Regional Project Location

Figure 2
Project Site Boundaries

The site is identified by APN 402-282-014-8, 402-282-013-0, 402-282-026-2, 402-282-027-0, 402-282-028-8, 402-282-010-6, 402-282-009-8, 402-282-007-2, 402-282-006-4, and 402-282-016-3. In addition, 402-282-008 is owned by a different property owner than the applicant. The applicant is to request and provide a letter of authorization from the 402-282-008 parcel owner authorizing Hillsboro Properties, Inc. to reface the facades of Shops 2E and 3E as part of Phase I of the proposed project.

Currently, the site is developed with the Appian 80 Shopping Center, which includes a Safeway grocery store, a vacant CVS pharmacy, various other smaller businesses totaling approximately 93,193 square feet (sf), and associated parking. Per the Three Corridors Specific Plan, the project site is located within the Service Sub-Area of the Appian Way Specific Plan area. The Specific Plan designates the site Commercial Mixed Use with a High Density Residential Overlay (CMU-HDRO), consistent with the site's zoning designation.

The site is bound by Tara Hills Drive to the north and Appian Way to the east. Surrounding land uses include a shopping center to the north, across Tara Hills Drive, a medical office building (Bay Area Laser Cosmetic Surgery Center) to the east, and a single-family residential neighborhood to the west. I-80 is located approximately 150 feet to the south of the site. While the topography of the developed portions of the project site are relatively level, the topography in the vicinity of the site slopes to the northwest, towards San Pablo Bay. South of the southern site boundary, the ground surface slopes downward, creating a wide gully between the project site and I-80.

Primary access to the project site is provided by a driveway connecting to Tara Hills Drive at the signalized intersection near the center of the site frontage. An additional right-in, right-out driveway is provided to the west of the primary access, with a third driveway provided at the far western edge of the site frontage. The westernmost access is used primarily for delivery traffic. In addition to the three existing vehicle access points, a pedestrian staircase located at the northeastern corner of the site provides connectivity between the parking lot and the existing sidewalk along the south side of Tara Hills Drive. Parking is currently provided by 454 standard parking stalls and 10 Americans with Disabilities Act (ADA)-compliant stalls.

Project Components

The proposed project would include renovation of the existing Appian 80 Shopping Center located on the project site. The proposed improvements, including demolition and construction activities, are described below.

The proposed project would include demolition of the existing building housing the Safeway grocery store and vacant CVS pharmacy, the existing shops along the eastern side of the Safeway building, the car wash and antique restoration store buildings located within the western portion of the site, and a portion of the existing building housing the former O'Reilly Wheel Works and Pizza Hut (see Figure 3). The existing China Delight restaurant building, the dry cleaner/fitness studio/seafood, and barbeque restaurant/former Chase Bank buildings located within the eastern portion of the site would remain and not be altered as part of the proposed project. New structures would be constructed on-site, including, but not limited to, a Safeway fuel station and associated kiosk, a casual sit-down restaurant, new building space to house the Safeway grocery store and other shops, and a drive-through restaurant (see Figure 4).

Figure 3
Proposed Demolition Plan

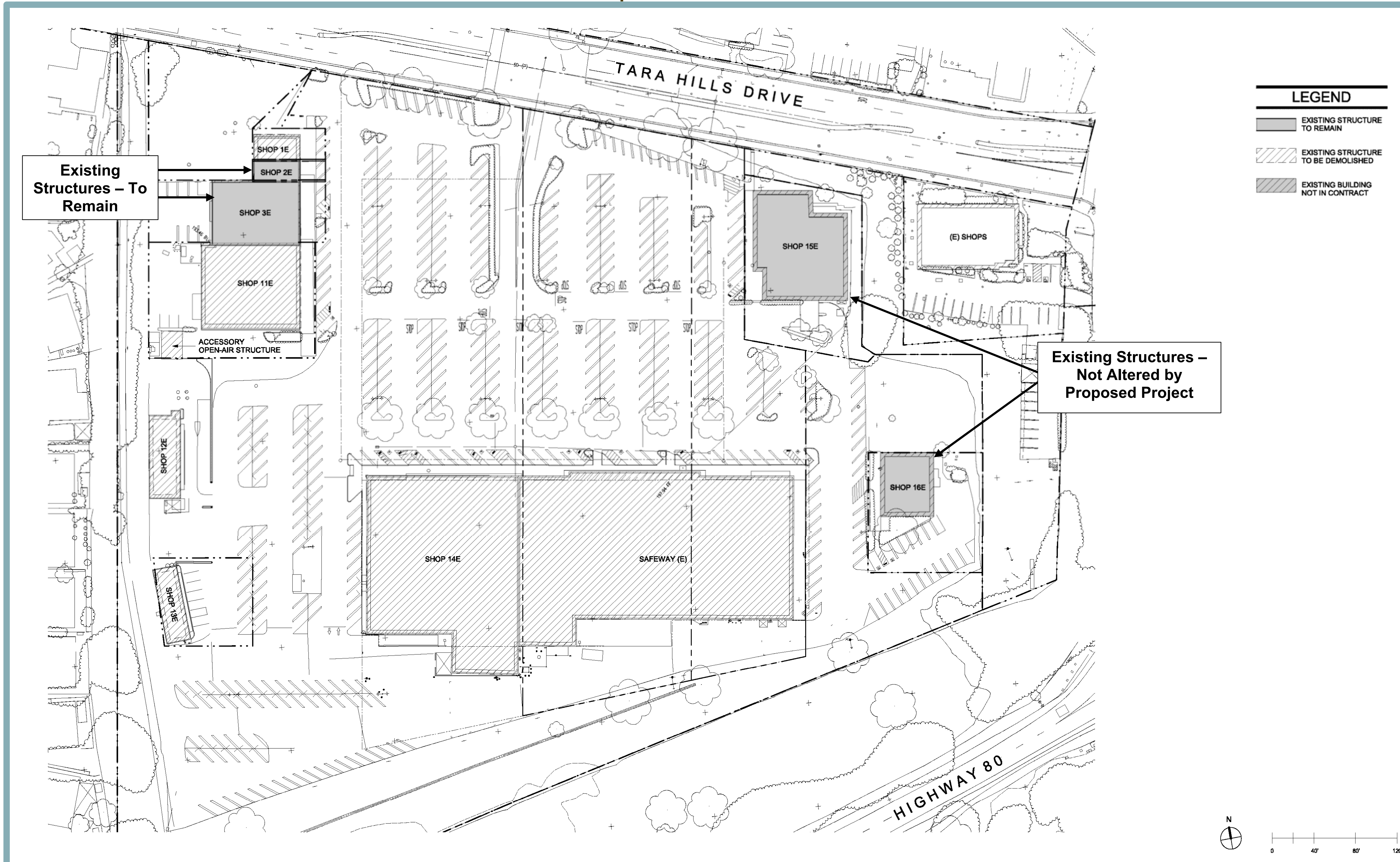
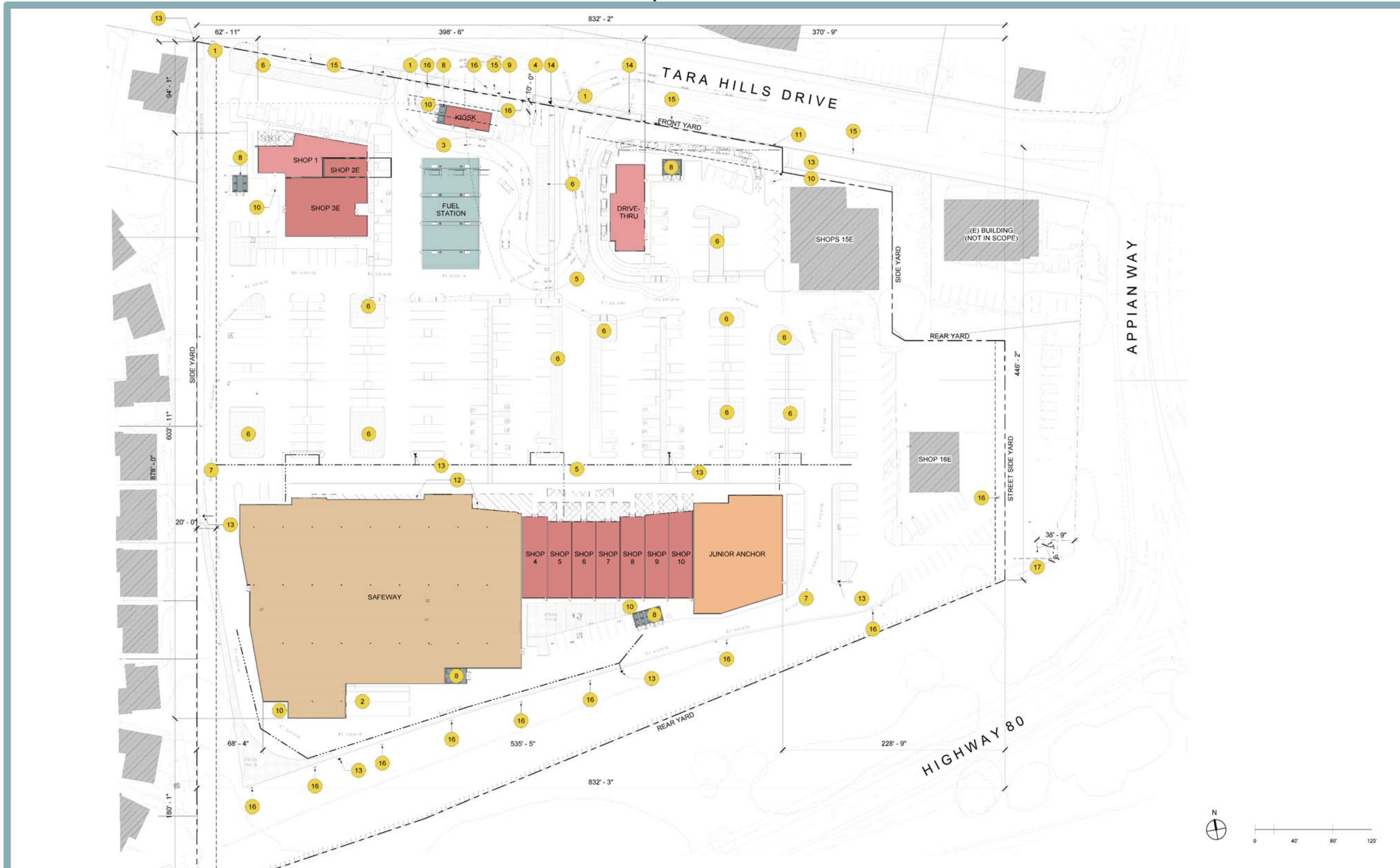


Figure 4
Proposed Site Plan



Proposed Buildings/Structures

Table 1 below provides a summary of each of the proposed buildings, along with the existing buildings that would be retained as part of the proposed project. As shown in the table, the proposed project would not include any modifications to the existing China Delight restaurant building (Shop 16E) and the dry cleaner/other businesses buildings (Shops 15E) located within the eastern portion of the site. As shown in the table, the proposed project would result in a net increase of 11,956 sf of commercial building space relative to existing conditions.

Table 1
Existing and Proposed Building Mix

Building Identifier	Existing (sf)	Proposed (sf)
Safeway	38,665	55,044
Shop 1E	942	0
Shop 2E	877	897
Shop 3E	5,298	5,038
Shop 11E	6,421	0
Shop 12E	2,491	0
Shop 13E	1,726	0
Shop 14E	24,919	0
Shop 15E*	8,689	8,689
Shop 16E*	3,165	3,165
Drive-Through Restaurant	0	3,005
Junior Anchor	0	10,357
Fueling Station Kiosk	0	1,100
Shop 1	0	3,166
Shop 4-10	0	14,688
Total	**93,193**	**105,149**

* Not altered as part of the proposed project.

The new Safeway grocery store would total 55,044 sf and would include a pharmacy, café, deli, bakery, and other typical grocery store features. Loading dock space would be provided at the south side of the building, facing away from the proposed parking areas. A total of 25,045 sf of commercial space capable of accommodating approximately seven separate tenants and one junior anchor tenant would be provided to the east of the Safeway building. Combined, the buildings would total 80,089 sf, a modest increase relative to the 63,584 sf of building space currently located in the southern portion of the site.

The Safeway gas station, to be located within the northern portion of the site, would include a total of 16 fueling stations. Two new 30,000-gallon Xerxes underground fuel storage tanks would be installed to the east of the fueling stations. The associated Safeway kiosk would include 1,100 sf and would provide convenience items for gas station patrons.

The proposed drive-through restaurant building would also be located within the northern portion of the site and would include a total of 3,005 sf. An illuminated menu display and associated speaker/intercom order station would be provided along the drive-through aisle at the north side of the building, adjacent to Tara Hills Drive. The payment and pickup window(s) would be located at the west side of the building. Consistent with Section 17.040.040(D) of the City's Municipal Code, the drive-up windows and order stations would be located over 300 feet from the nearest residential property line.

All of the buildings that would be modified or constructed as part of the proposed project would be designed to share a unified architectural theme. The proposed Safeway building would be limited to a maximum height of 33 feet, while the remainder of the proposed buildings would be limited to a height of approximately 31 feet or less. This falls well within the 75-foot maximum building height for the Appian Way Service Sub-Area. It should be noted that the proposed project would include replacement of the existing 50-foot-tall Appian 80 Shopping Center pylon sign currently located at the southeastern site boundary. The new 75-foot-tall pylon sign would be located in the same location and would include a maximum area of 750 sf, consistent with the standards established by Section 17.52.060 of the City's Municipal Code. The proposed pylon sign would require approval of a Sign Program (S19-080) pursuant to Section 17.12.110(B)(2) of the Municipal Code, which would be applied for separately than the project's other entitlements.

Operations

The proposed Safeway grocery store and gas station would be open 24 hours per day. The proposed project would not include any substantial changes to the grocery store operations or delivery schedules. As occurs currently, delivery trucks would access the loading docks south of the proposed Safeway building and other attached businesses by way of a drive aisle located along the western site boundary. Similar to the grocery store and gas station, the loading dock would be accessible 24 hours per day. The proposed Safeway gas station would include an average daily throughput of approximately 24,218 gallons.

Hours of operation for drive-through facilities are not addressed in the City's Municipal Code; rather, any limits on operations are approved by the City on a case-by-case basis prior to issuance of Conditional Use Permits. The nearest existing off-site drive-through is the McDonald's drive-through at 1402 Tara Hills Drive, which operates from 5:00 AM to 10:00 PM on Sunday through Thursday and 5:00 AM to 12:00 AM on Friday and Saturday. The dining room hours at the existing McDonalds are restricted to 5:00 AM to 10:00 PM daily. For reference, of the other eight existing drive-through restaurants within a mile of the project site, two include 24-hour operations (Jack-in-the-Box and Taco Bell); two operate until 1:00 AM/1:30 AM (Wendy's and In-N-Out); and two (Burger King and Carl's Jr.) operate until 12:00 AM on Sundays/weekdays and until 1:00 AM on weekends. The Fitzgerald Drive KFC operates until 10:00 PM daily and the associated Starbucks operates until 9:30 PM Sunday and weekdays, until 11:00 PM on Fridays, and until 10:00 PM Saturdays. Hours of operation at the proposed drive-through building would likely be similar to the existing McDonald's: 5:00 AM to 10:00 PM Sunday through Thursday and 5:00 AM to 12:00 AM on Friday and Saturday, with dining room hours limited to 5:00 AM to 10:00 PM daily.

Operations at the proposed buildings would generally be governed by two requested Variances (Variance for Safeway Fuel Station Proximity to Nearest Chevron Station on Appian and Tara Hills Drive and Variance for Wood instead of Masonry Fence between Different Land Uses) and the following eight requested Conditional Use Permits: New Safeway Store Alcohol Sales, Outdoor Merchandise Sales Safeway, Commercial Pad Drive Through [Pad 3], Outdoor Dining In Line Shop Space, Outdoor Dining Pad 1, Reduced Parking, New Safeway Fuel Kiosk Alcohol Sales, and Automobile Service Station.

Landscaping, Patios, and Fencing

As part of the proposed project, removal of a total of 44 existing on-site trees sized six inches or larger (four inches or larger for native trees) would be required in order to accommodate the proposed renovations (see Figure 5).

Figure 5
Illustrative Landscaping Plan

The trees would be replaced in accordance with Table 17.44.070-1 Tree Replacement Schedule of the City's Municipal Code. The existing off-site trees located adjacent to the western site boundary would be retained, along with one existing on-site tree located along the eastern site frontage at Tara Hills Drive. In addition, the proposed project would include planting of approximately 200 evergreen and deciduous trees throughout the on-site parking lot and drive aisles. At the project entries and at pedestrian-focused areas within the site, the proposed project would include accent plantings and special paving, including interlocking pavers. Monument signage would be provided at the primary project entry along Tara Hills Drive.

The project would include a 1,413-sf patio along the northern edge of the proposed Safeway building and a 2,961-sf patio at the associated shops to the east of the Safeway building (Figure 6). The patio areas would include shaded outdoor tables and would be buffered from the parking lot by trees, potted plants, and other landscaping elements. Use of the patios would be subject to CUPs for Outdoor Merchandise Sales Safeway and Outdoor Dining In Line Shop Space, noted above. In addition, a 568-sf patio with a covered awning would be located to the northeast of the proposed buildings in the northwestern portion of the site (see Figure 7, "Shop 1"). The 558-sf patio would serve as outdoor dining space for the attached building, pursuant to a CUP for Outdoor Dining Pad 1. In total, the project would provide for 4,942 sf of outdoor patio space, to serve as public gathering areas.

The proposed project would replace the existing fence along the western project site boundary with a seven-foot-tall wooden fence (see Figure 8). The project would seek a Variance for Fences, Walls and Screening between Different Land Uses to construct the wall of wood between residences and the project site rather than a masonry wall per Section 17.42.050 of the City of Pinole Municipal Code. The proposed project would include the construction of a new retaining wall along the eastern portion of the project site frontage at Tara Hills Drive. South of the proposed Safeway building and neighboring shops to the east, the proposed project would retain the existing vertical curb. In addition, the existing walls located to the east of the China Delight restaurant building and the dry cleaner/other businesses buildings (Shops 15E and 16E) would remain in place.

Access, Circulation, and Parking

With construction of the proposed project, vehicle access would continue to be provided by the three existing access points. However, the internal site circulation would be altered to provide greater connectivity between the on-site buildings. The existing angled parking within the on-site parking lot would be reconfigured to 90-degree parking perpendicular to the drive aisles. Per Chapter 17.48 of the City's Municipal Code, a total of 436 vehicle parking spaces are required for the proposed project. Per ADA and the 2019 California Building Standards Code (CBSC), a minimum of nine accessible parking spaces, two van accessible parking spaces, 35 Clean Air Vehicle spaces, and 27 electric vehicle (EV) charging stations are required. Overall, with a requested Reduced Parking CUP, the proposed project would provide for a total of 383 parking spaces. Of the 383 spaces, 21 would be ADA-compliant (including van-accessible spaces), 30 would be Clean Air Vehicle spaces, and 22 spaces would be EV charging stations. New pedestrian walkways would be constructed throughout the site to provide continuous pedestrian connectivity between the proposed buildings, parking areas, and the existing sidewalk along Tara Hills Drive. The existing pedestrian staircase within the northeastern portion of the site would be eliminated. The project would include eight double bike lockers with space for 16 bikes, six vertical bike lockers with space for six bikes, and 11 bike racks with space for 22 bikes. In total, 44 new bike parking spaces would be provided on-site.

Figure 6
Illustrative Landscaping Plan: Promenade Enlargement

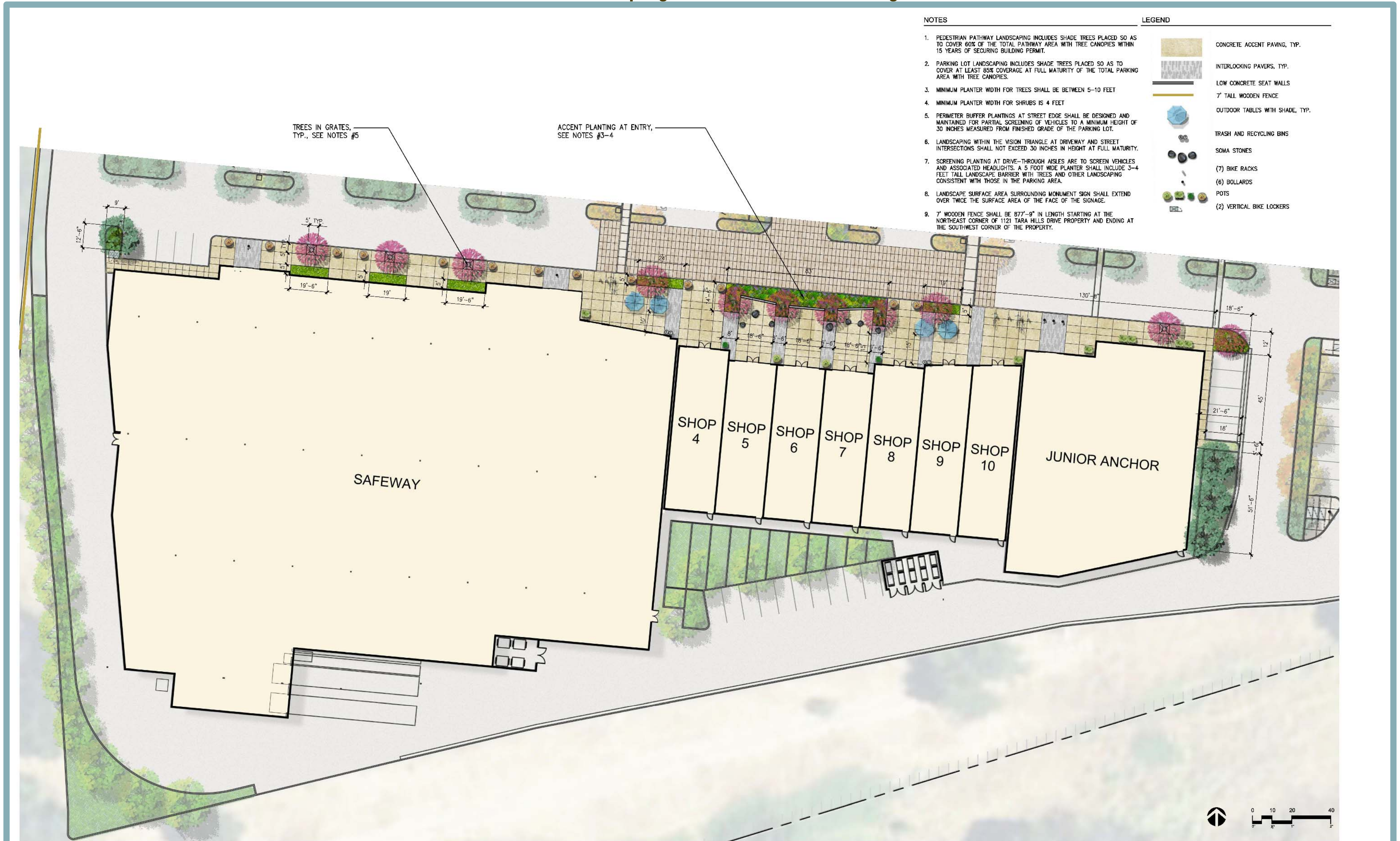


Figure 7
Illustrative Landscaping Plan: Tara Hills Drive Frontage Enlargement

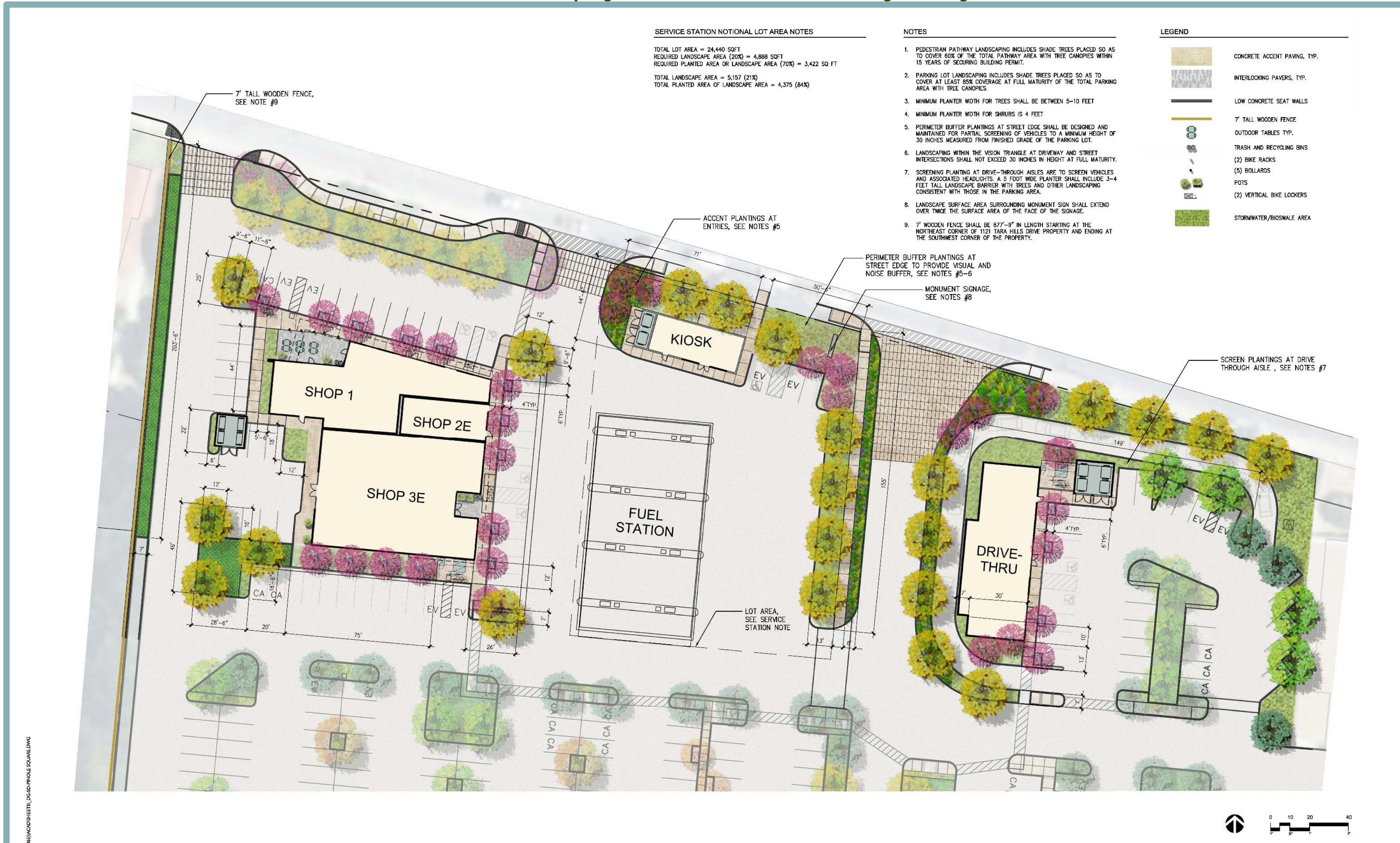
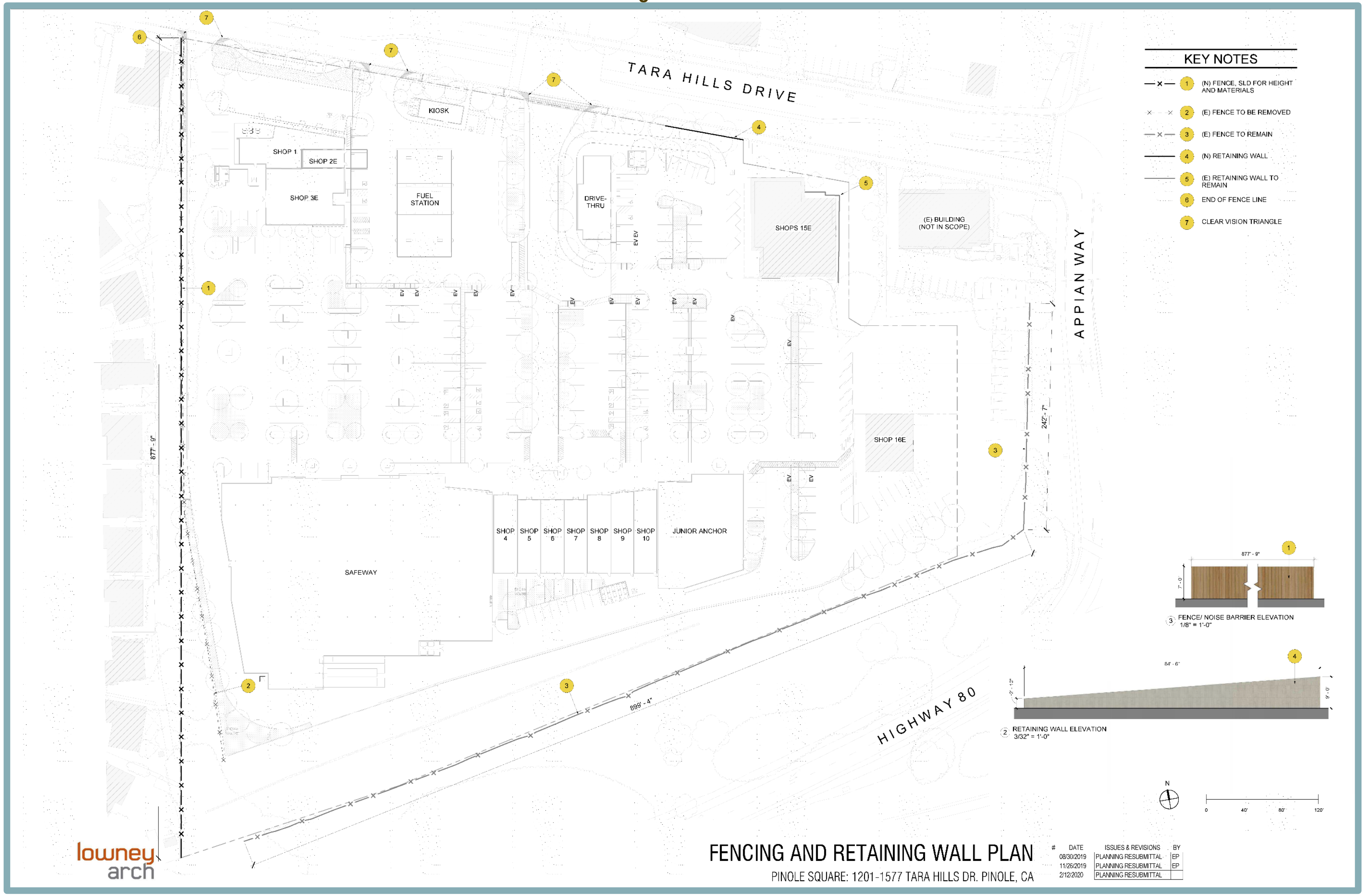


Figure 8
Fencing and Wall Plan



Utilities

Water supply service, wastewater service, and stormwater conveyance for the proposed project would continue to be provided by the City of Pinole through connections to existing utility infrastructure in the project site vicinity. As part of the proposed project, a portion of the existing water lines, water meters, storm drain pipes, and storm drain inlets within the project site would be removed. New eight-inch water mains would be installed, connecting to the City's existing water main located in Tara Hills Drive. In addition, new sanitary sewer cleanouts and grease interceptors would be provided on-site.

Stormwater runoff from impervious surfaces within the project site would sheet flow to a series of new bio-retention basins to be constructed throughout the project site. Each bio-retention basin would provide for treatment of incoming stormwater. Treated runoff would be collected by perforated underdrains in each basin, which would route runoff to an existing 24-inch underground storm drain within the project site before ultimately flowing to the City's existing storm drain located within Tara Hills Drive to the north of the site.

Electricity for the project site would continue to be provided by PG&E. Existing overhead electrical and telephone lines within the project site, as well as existing power poles, would be relocated to accommodate the proposed site layout. Per Section 17.50.030 of the City's Municipal Code, all on-site utilities that would have the capacity to serve the proposed project would be installed underground, as feasible. At the City's discretion, the project may not be required to include undergrounding of the existing electrical equipment within the western portion of the site, provided that the proposed project does not draw any electricity from such facilities.

Phasing

The proposed project is anticipated to be implemented over two phases (see Figure 9). Phase 1 would include construction of the proposed Safeway building, the associated Safeway fuel station and retail kiosk, improvements related to Shop 3E, Shop 2E, and Shop 1 (adjacent to the existing Bank of America building), tree removal, and all parking lot and drive aisle improvements. Phase 2 would include construction of the retail shops and junior anchor to be located directly east of the Safeway store, as well as construction of the drive-through restaurant.

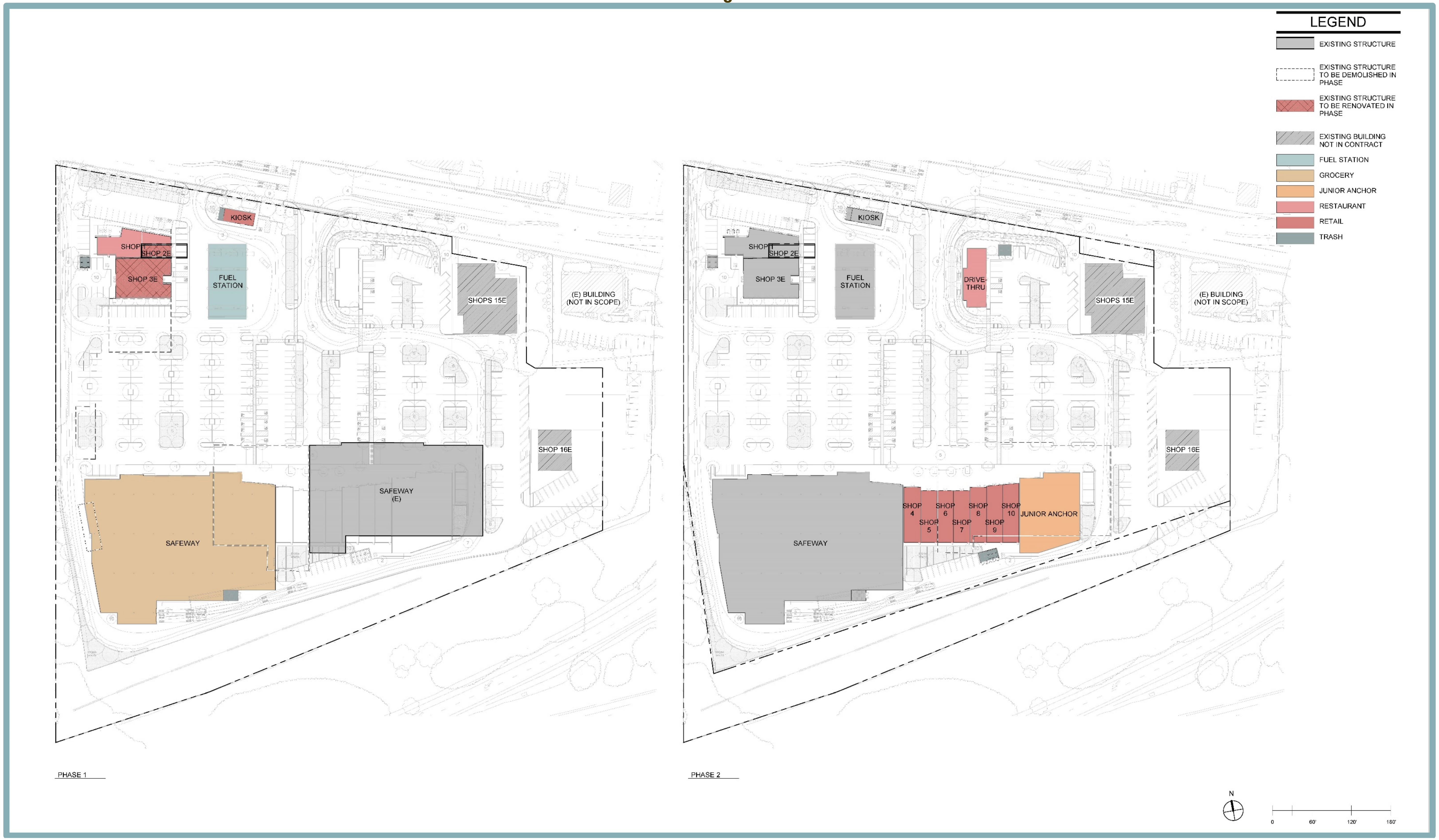
Demolition and Construction Details

As noted previously, the proposed project would include demolition of a portion of the existing on-site buildings, trenching for utility improvements, improvements to the existing parking lot and drive aisles, construction of new buildings, and landscaping improvements. Construction activities are anticipated to begin in 2020 and occur over approximately two years. Generally, substantial grading would not be required, as the site has been leveled as part of prior development activities. However, this IS/MND assumes that the majority of the site could be subject to ground disturbance, including disturbance associated with utility trenching and building foundation construction.

Specific Plan Amendment

According to Table 6.14, Permitted Use Table for Appian Way, of the Three Corridors Specific Plan, drive-in/drive-through sales/services or service stations are not permitted uses within the CMU land use designation. Thus, the proposed project would require an amendment to the Specific Plan in order to allow for the proposed drive-through restaurant and Safeway gas station on the project site.

Figure 9
Phasing Plan



The Specific Plan text amendment would allow for drive-in/drive-through sales/services and service stations land use classifications with a Conditional Use Permit in the Appian Way Service Sub-Area CMU zone, provided that such land uses are a part of a shopping center project (not stand alone) and owned by an on-site major retailer within the shopping center project.

Discretionary Actions

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

- Adoption of the IS/MND;
- Approval of a Mitigation Monitoring and Reporting Program;
- Approval of a Specific Plan Amendment to allow for the proposed drive-through restaurant and gas station on the project site;
- Approval of Design Review pursuant to Section 17.12.150 of the City of Pinole Municipal Code;
- Approval of Variance (Safeway Fuel Station Proximity to Nearest Chevron Station on Appian Way and Tara Hills Drive) pursuant to Section 17.34.040 of the City of Pinole Municipal Code;
- Approval of Variance Wood instead of Masonry Fence between Different Land Uses) pursuant to Section 17.42.050 of the City of Pinole Municipal Code;
- Approval of Conditional Use Permits;
  - CUP (New Safeway Store Alcohol Sales pursuant to Section 17.59.030 of the City of Pinole Municipal Code);
  - CUP (Outdoor Merchandise Sales Safeway pursuant to Sections 17.10.060 and 17.68.020 of the City of Pinole Municipal Code);
  - CUP (Commercial Pad Drive Through [Pad 3] within Appian Service Sub-Area CMU zoning designation pursuant to Section 17.40.030 of the City of Pinole Municipal Code);
  - CUP (Outdoor Dining In Line Shop Space pursuant to Sections 17.10.060 and 17.68.020 of the City of Pinole Municipal Code);
  - CUP (Outdoor Dining [Pad 1] pursuant to Sections 17.10.060 and 17.68.020 of the City of Pinole Municipal Code);
  - CUP (Reduced Parking pursuant to Section 17.48.060 of the City of Pinole Municipal Code) and;
  - CUP (New Safeway Fuel Center Kiosk Alcohol Sales pursuant to Section 17.59.030 of the City of Pinole Municipal Code).
  - CUP (Automobile Service Station)
- Approval of One Lot Parcel Map;

Approval of a Sign Program pursuant to Section 17.12.110(B)(2) of the City of Pinole Municipal Code for the proposed pylon sign would be applied for as a separate application from the above discretionary actions.

G. ENVIRONMENTAL CHECKLIST

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

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

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

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

No Impact: The project would not have any impact.

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

Discussion

a. Examples of typical scenic vistas include mountain ranges, ridgelines, or bodies of water as viewed from a highway, public space, or other area designated for the express purpose of viewing and sightseeing. Views of the San Pablo Bay and surrounding City of Pinole can be seen from nearby ridgelines. However, per the City's General Plan EIR, the City does not have any officially designated scenic vistas within the planning area.[5] Therefore, development of the proposed project would not have a substantial adverse effect on a scenic vista, and a ***less-than-significant*** impact would occur.

b. Per the California Scenic Highway Mapping System, the project site is not located within the vicinity of an officially designated State Scenic Highway.[6] Thus, the proposed project would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State Scenic Highway, and ***no impact*** would occur.

c. The project site is located within an urbanized area of the City and is currently developed with a commercial shopping center. Surrounding land uses include a shopping center to the north, across Tara Hills Drive, a medical office building (Bay Area Laser Cosmetic Surgery Center) to the east, and a single-family residential neighborhood to the west. I-80 is located approximately 150 feet to the south of the site. Public views of the project site include views from I-80 to the south of the site, Tara Hills Drive to the north, Canyon Drive to the northeast, and Appian Way to the east.

The proposed project would include demolition of the existing building housing the Safeway grocery store and vacant CVS pharmacy, the car wash and antique restoration store buildings located within the western portion of the site, and a portion of the existing building housing the former O'Reilly Wheel Works and Pizza Hut. The existing China Delight restaurant building and the dry cleaner/other businesses buildings located within the eastern portion of the site would remain. New structures would be constructed on-site, including, but not limited to, a kiosk, fuel station, and new building space to house the Safeway grocery store and other shops.

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5 City of Pinole. *General Plan Update Draft Environmental Impact Report, SCH #2009022057.* July 2010.

6 California Department of Transportation. *Scenic Highways.* Available at: https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways. Accessed September 2019.

The proposed project would be subject to the City's Design Review process pursuant to Section 17.12.150 of the City of Pinole Municipal Code. The purpose of comprehensive design review is to "provide a process for promoting the orderly and harmonious growth of the City, to encourage development in keeping with the desired character of the City, and to ensure physical and functional compatibility between uses". In addition, the proposed project would require City approval of a Sign Program pursuant to Section 17.12.110 of the Municipal Code for the proposed freestanding pylon sign and the proposed Safeway fuel and tenant monument (see Figure 10). The Sign Program would include criteria for building-attached and freestanding signs for business activities within the site, as well as the integrated development itself, to establish complementary signage, consistency of sign type, location, logo, and/or letter height, lines of copy, illumination, and construction details of signs for the project. Such requirements would ensure that all signage included in the proposed development would not degrade the visual character or quality of the site, as viewed from public areas in the project vicinity.

Figure 11 below provides an overview of key public viewpoints in the project vicinity. Figure 12 through Figure 22 provide examples of existing views of the project site from each viewpoint, along with simulations depicting anticipated views of the project site upon completion of the proposed redevelopment. As shown in the figures, while the proposed project would be visible from public viewpoints in the project area, the project would be of a similar size and scale as the existing development on the project site. In addition, views of the proposed project from I-80, including views of the proposed freestanding pylon sign, would be partially screened by existing vegetation located south of the site, which would be retained as part of the proposed project.

Given that the project site is currently developed with a shopping center, the project would not be considered to substantially degrade the existing visual character or quality of public views in a non-urbanized area. In addition, the proposed project would be consistent with all applicable zoning of the site and other regulations governing scenic quality. Therefore, a ***less-than-significant*** impact would occur.

d. As noted previously, the project site is currently developed with a commercial shopping center and an associated parking lot. In addition, streetlights are provided along Tara Hills Drive and Appian Way to the north and east of the site, respectively. Thus, the project vicinity contains existing sources of light and glare.

The proposed redevelopment would introduce new sources of light and glare to the site in the form of lighting on building exteriors and signage, new lighting fixtures within the on-site parking lot, and lighting associated with the proposed freestanding pylon sign. However, such sources of light and glare would not be substantially more intensive than what currently occurs in the vicinity of the project site, and would be consistent with the type of lighting anticipated for the project site per the City's General Plan land use and zoning designations for the site.

Per the Photometric Analysis prepared for the proposed project (see Figure 23 below), upon implementation of the project, lighting from the project site would not spill onto the adjacent residential properties to the west of the site or Appian Way to the east of the site. Along the project frontage at Tara Hills Drive, lighting would be limited to 2.9 foot-candles (fc) or less. Light levels to the south of the site would be approximately 0.1 fc or less. Therefore, lighting associated with the proposed project would not adversely affect the nighttime lighting environment for sensitive receptors in the project vicinity, including the existing single-family residences located to the west of the site.

Figure 10
Proposed Signage

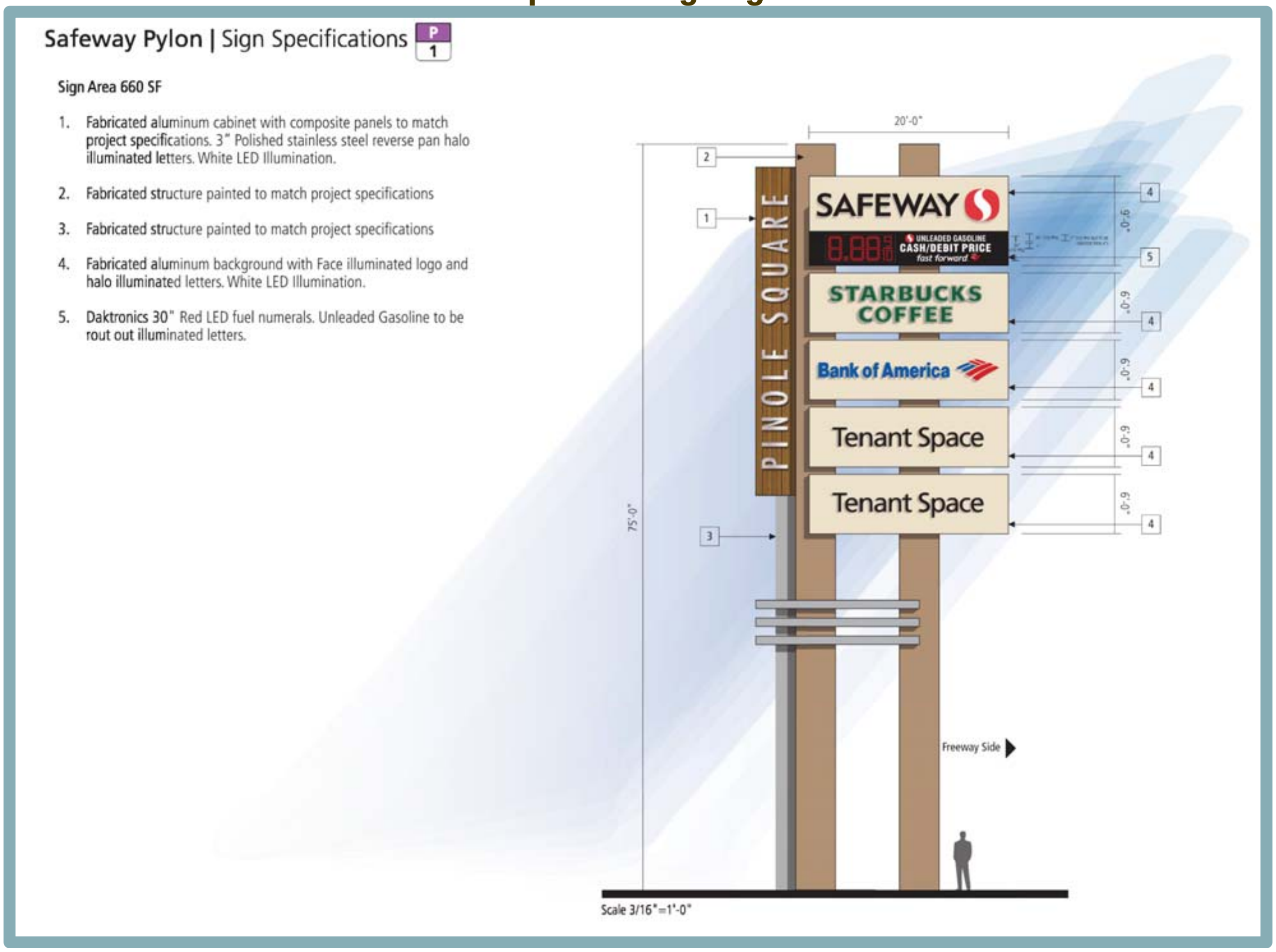


Figure 11
Photo Simulation Locations

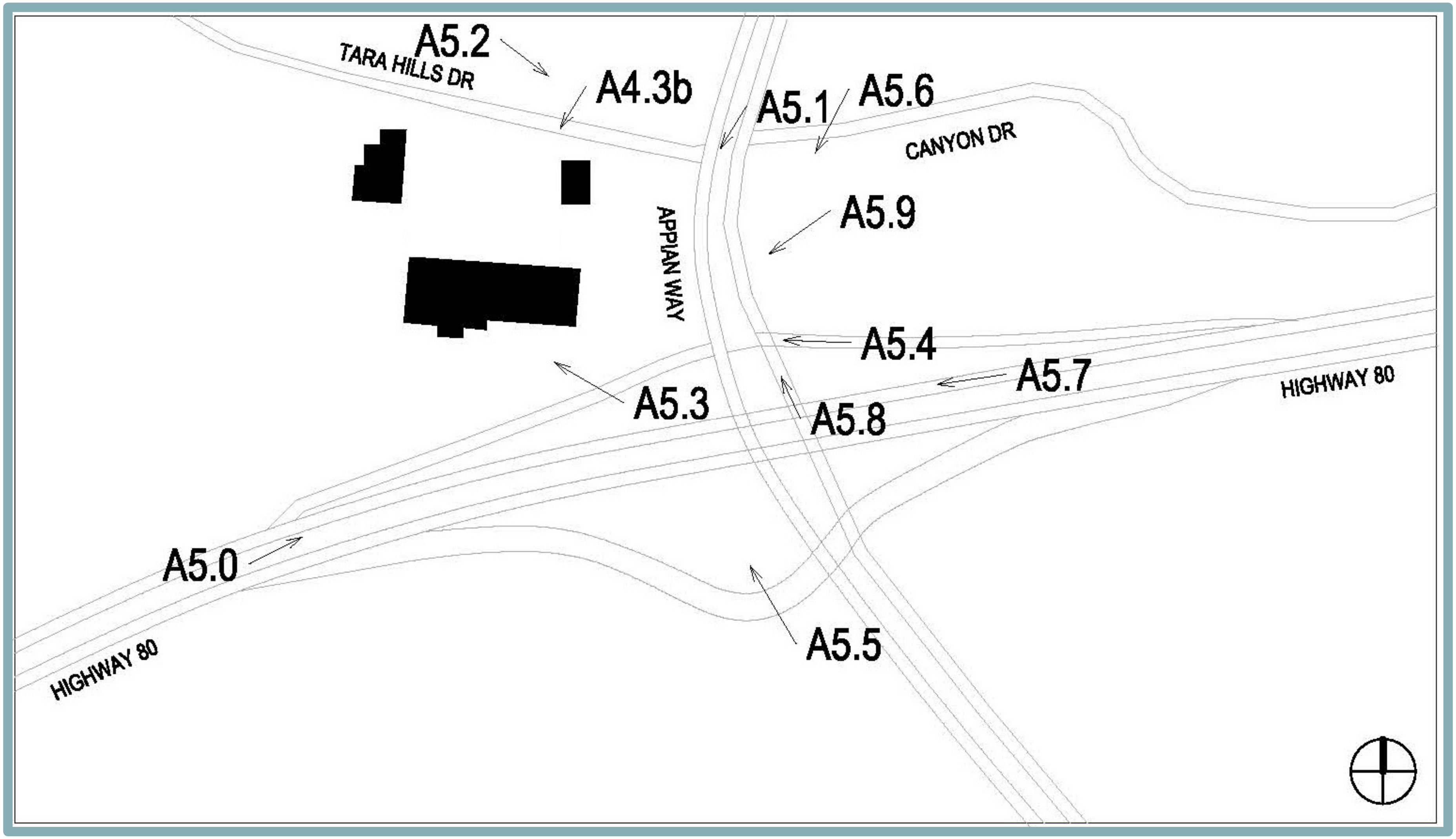


Figure 12
Proposed View from Tara Hills Drive Looking South (A4.3b)

A4.3b - PHOTOSIMULATION

Figure 13
View from I-80 Looking Northeast (A5.0)

BEFORE

INTERSTATE 80 EASTBOUND VIEW OF THE EXISTING CONDITIONS

AFTER

INTERSTATE 80 EASTBOUND VIEW OF THE PROPOSED PROJECT

Figure 14
View from Canyon Drive Looking Southwest (A5.1)

BEFORE

CANYON DRIVE WESTBOUND DIRECTION LOOKING SOUTHWEST TOWARD THE EXISTING PYLON SIGN

AFTER

CANYON DRIVE WESTBOUND DIRECTION LOOKING SOUTHWEST TOWARD THE PROPOSED PYLON SIGN

Figure 15
View from Tara Hills Drive Looking Southeast (A5.2)

BEFORE

TARA HILLS DRIVE EASTBOUND VIEW OF THE EXISTING CONDITIONS

AFTER

TARA HILLS DRIVE EASTBOUND VIEW OF THE PROPOSED PROJECT

Figure 16
View from I-80 On-Ramp Looking Northwest (A5.3)

BEFORE

VIEW FROM WESTBOUND 180 ON RAMP VIEW OF THE EXISTING CONDITIONS

AFTER

VIEW FROM WESTBOUND 180 ON RAMP VIEW OF THE PROPOSED CONDITIONS

Figure 17
View from I-80 Off-Ramp Looking West (A5.4)

BEFORE

180 AND APPIAN WAY INTERCHANGE WESTBOUND OFF RAMP

AFTER

180 AND APPIAN WAY INTERCHANGE WESTBOUND OFF RAMP

Figure 18
View from South of I-80 Looking North (A5.5)

BEFORE

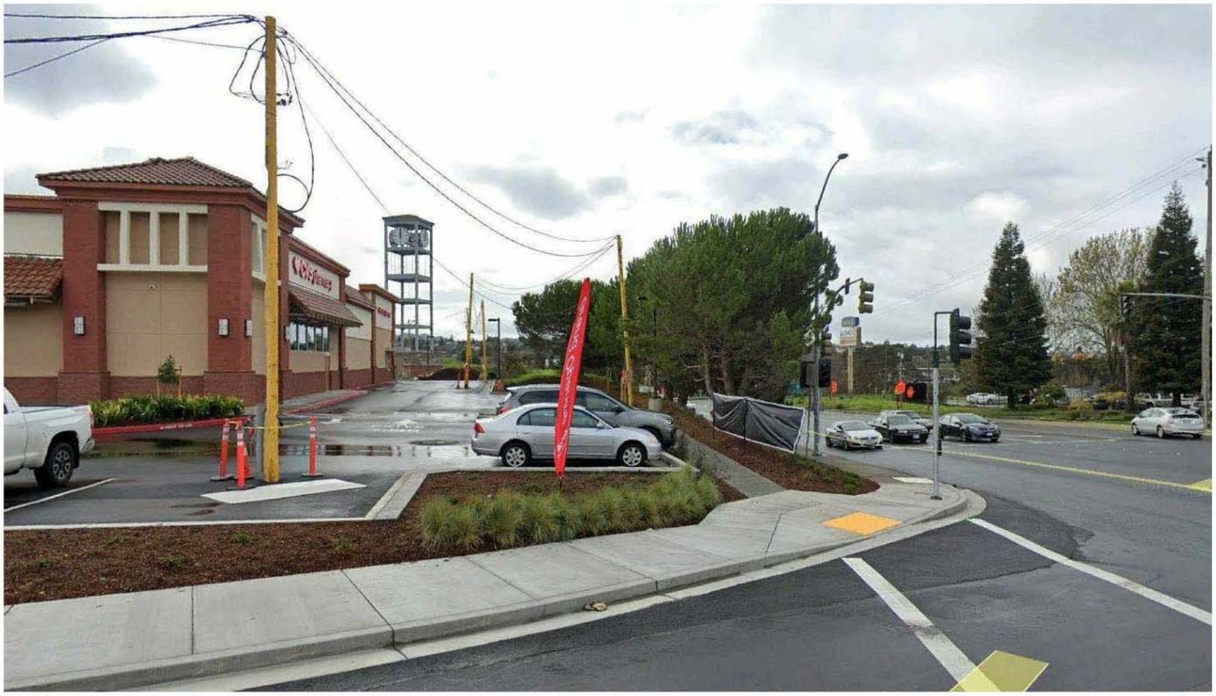
VIEW FROM ACROSS I-80 ACCESS ROAD, NEAR SHOPS BUILDINGS (CURRENTLY BURGER KING, WING STOP)

AFTER

VIEW FROM ACROSS I-80 ACCESS ROAD, NEAR SHOPS BUILDINGS (CURRENTLY BURGER KING, WING STOP)

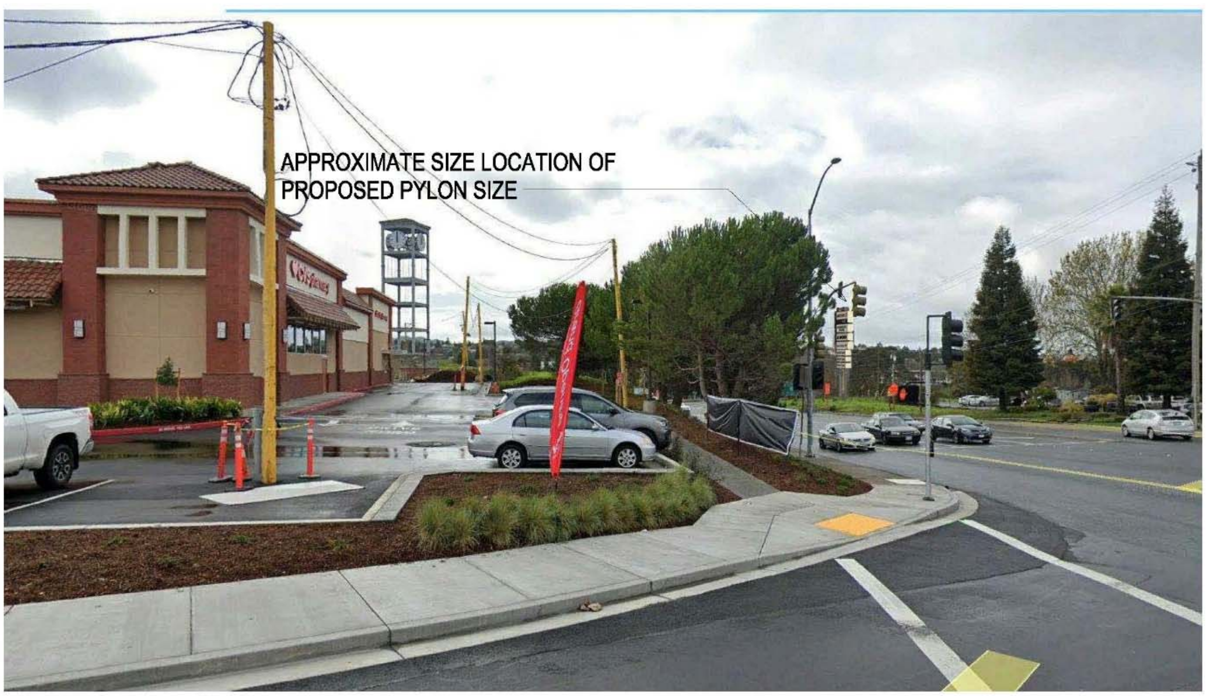
Figure 19
View from Canyon Drive Looking Southwest (A5.6)

BEFORE



CANYON DRIVE LOOKING SW

AFTER



CANYON DRIVE LOOKING SW

Figure 20
View from I-80 Looking West (A5.7)

BEFORE

INTERSTATE 80 WESTBOUND VIEW OF THE EXISTING CONDITIONS

AFTER

INTERSTATE 80 WESTBOUND VIEW OF THE PROPOSED PROJECT

Figure 21
View from Appian Way Looking Northwest (A5.8)

BEFORE

INTERSTATE 80 AND APPIAN WAY INTERCHANGE LOOKING NORTHWEST OF EXISTING CONDITIONS

AFTER

INTERSTATE 80 AND APPIAN WAY INTERCHANGE LOOKING NORTHWEST VIEW OF THE PROPOSED PROJECT

Figure 22
View from Appian Way Looking West (A5.9)

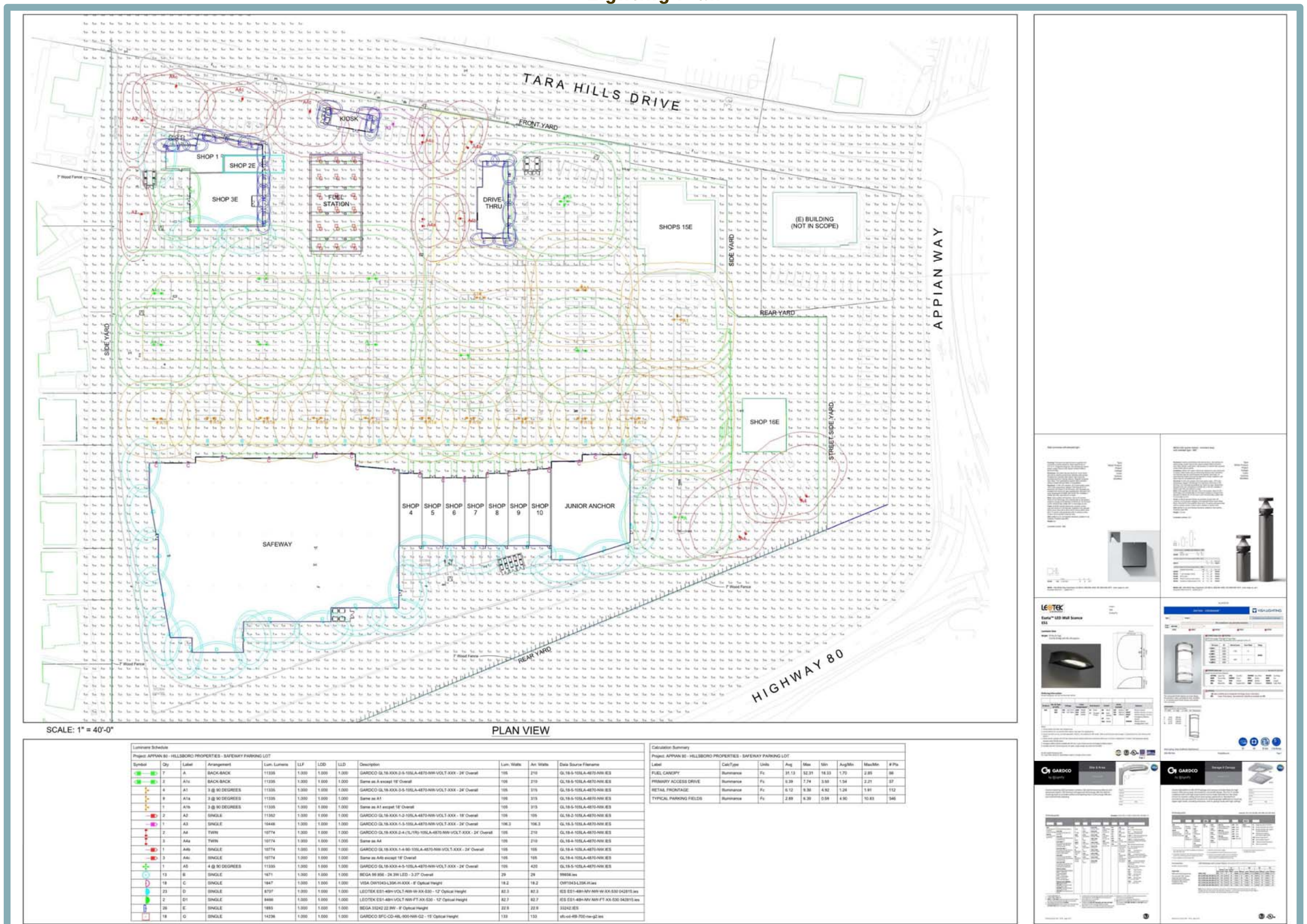
BEFORE

FROM ACROSS THE HIGHWAY

AFTER

FROM ACROSS THE HIGHWAY

Figure 23
Lighting Plan



Furthermore, all on-site lighting fixtures would be subject to the regulations included in Chapter 17.46, Lighting, of the City's Municipal Code. Per Section 17.46.050(A), all outdoor lighting must be "designed, located, installed, directed downward or toward structures, fully shielded, and maintained in order to prevent glare, light trespass, and light pollution". Section 17.46.050(C) requires that all non-exempt outdoor lighting is recessed and/or constructed with full downward shielding to reduce light and glare trespass onto adjoining properties and public rights-of-way. All signage associated with the project would comply with the lighting standards established by Section 17.52.100(B), Sign Illumination, of the City's Municipal Code.

Based on the above, the proposed project would not create a new source of substantial light or glare that would adversely affect day or nighttime views in the area. Thus, a ***less-than-significant*** impact would occur.

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

Discussion

a-e. The project site is currently developed with a commercial shopping center, is surrounded by existing development, and is characterized as "Urban and Built-Up Land" per the California Department of Conservation Farmland Mapping and Monitoring Program.[7] The site is zoned CMU-HDRO, which does not allow for agricultural uses. In addition, the project site is not under a Williamson Act contract. Furthermore, the project site is not considered forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g)), and would not result in the loss or conversion of such land to non-forest use, nor conflict with existing zoning for, or cause for rezoning, of such land. The proposed project would not involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use. Therefore, ***no impact*** to agricultural and forest resources would occur with development of the proposed project.

[7] California Department of Conservation. *California Important Farmland Finder.* Available at: https://maps.conservation.ca.gov/DLRP/CIFF/. Accessed September 2019.

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

Discussion

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

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

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

The aforementioned air quality plans contain mobile source controls, stationary source controls, and transportation control measures to be implemented in the region to attain the State and federal AAQS within the SFBAAB. Adopted BAAQMD rules and regulations, as well as the thresholds of significance, have been developed with the intent to ensure continued attainment of AAQS, or to work towards attainment of AAQS for which the area is currently designated nonattainment, consistent with applicable air quality plans.[8] The BAAQMD's established significance thresholds associated with development projects for emissions of the ozone precursors reactive organic gases (ROG) and oxides of nitrogen (NO_x), as well as for PM_{10} and $PM_{2.5}$, expressed in pounds per day (lbs/day) and tons per year (tons/yr), are listed in Table 2. By exceeding the BAAQMD's mass emission thresholds for emissions of ROG, NO_X, PM_{10}, or $PM_{2.5}$, a project would be considered to conflict with or obstruct implementation of the BAAQMD's air quality planning efforts.

Table 2
BAAQMD Thresholds of Significance

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

Source: BAAQMD, CEQA Guidelines, May 2017.

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

- Construction would occur over an approximately two-year period;
- The project would include demolition of approximately 75,300 sf of building space;[9]
- The project would include import of 550 cubic yards (CY) of material and export of 2,215 CY of material during grading;
- The project would improve pedestrian network connectivity within the project site and by providing sidewalks; and
- Trip generation data was adjusted based on the Transportation Impact Study prepared for the proposed project by TJKM.

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

8 Bay Area Air Quality Management District. *California Environmental Quality Act Air Quality Guidelines*. May 2017.
9 It should be noted that the existing building square footage was further refined since the time the project modeling was conducted. Based on the refinement, the amount of building space anticipated to be demolished has reduced from 75,300 to 75,164 square feet. Because the building space assumed to be demolished in the modeling is greater than what is actually expected, the emissions associated with demolition of such would be similar to or less than what has been estimated and presented in this IS/MND.

Construction Emissions

According to the CalEEMod results, the proposed project would result in maximum unmitigated construction criteria air pollutant emissions as shown in Table 3. As shown in the table, the proposed project's construction emissions would be below the applicable thresholds of significance for ROG, NO_X, PM_{10}, and $PM_{2.5}$.

Table 3
Maximum Unmitigated Construction Emissions (lbs/day)

Pollutant	Proposed Project Emissions	Threshold of Significance	Exceeds Threshold?
ROG	5.71	54	**NO**
NO_X	52.85	54	**NO**
PM_{10} (exhaust)	2.20	82	**NO**
PM_{10} (fugitive)	18.21	None	**N/A**
$PM_{2.5}$ (exhaust)	2.02	54	**NO**
$PM_{2.5}$ (fugitive)	9.97	None	**N/A**

Source: CalEEMod, November 2019 (see Appendix A).

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

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

The proposed project's required implementation of the BAAQMD's Basic Construction Mitigation Measures listed above would help to further minimize construction-related emissions. In particular, implementation of the foregoing measures would reduce fugitive dust emissions resulting from project construction.

Even without consideration of BAAQMD's Basic Construction Mitigation Measures, as shown in Table 3, construction of the proposed project would result in emissions of criteria air pollutants below BAAQMD's thresholds of significance. Consequently, the proposed project would not conflict with air quality plans during project construction.

Operational Emissions

According to the CalEEMod results, the proposed project would result in net maximum unmitigated operational criteria air pollutant emissions as shown in Table 4. As shown in the table, the proposed project's net increase in operational emissions would be below the applicable thresholds of significance. Furthermore, even without accounting for emissions from existing on-site development that would be renovated or demolished as part of the project, total proposed project emissions would remain below the applicable thresholds of significance.

Table 4
Unmitigated Maximum Operational Emissions

Pollutant	Emissions						Threshold of Significance		Exceeds Threshold?
	Existing		Proposed		Net Change				
	lbs/day	tons/yr	lbs/day	tons/yr	lbs/day	tons/yr	lbs/day	tons/yr	
ROG	9.71	1.58	13.35	2.14	*3.64*	*0.56*	54	10	**NO**
NO_X	31.52	5.66	41.14	7.64	*9.62*	*1.98*	54	10	**NO**
PM_{10} (exhaust)	0.22	0.04	0.26	0.05	*0.04*	*0.01*	82	15	**NO**
PM_{10} (fugitive)	19.70	3.45	21.88	3.83	*2.18*	*0.38*	None	None	**N/A**
$PM_{2.5}$ (exhaust)	0.20	0.04	0.24	0.04	*0.04*	*0.00*	54	10	**NO**
$PM_{2.5}$ (fugitive)	5.27	0.93	5.85	1.03	*0.58*	*0.10*	None	None	**N/A**

Note: The above emissions estimates do not include emissions from existing on-site buildings that would not be altered as part of the proposed project.

Source: CalEEMod, November 2019 (see Appendix A).

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

Cumulative Emissions

Past, present, and future development projects contribute to the region's adverse air quality impacts on a cumulative basis. By nature, air pollution is largely a cumulative impact. A single project is not sufficient in size to, by itself, result in nonattainment of AAQS. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's contribution to the cumulative impact is considerable, then the project's impact on air quality would be considered significant. In developing thresholds of significance for air pollutants, BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. The thresholds of significance presented in Table 2 represent the levels at which a project's individual emissions of criteria air pollutants or precursors would result in a cumulatively considerable contribution to the SFBAAB's existing air quality conditions. If a project exceeds the significance thresholds presented in Table 2, the proposed project's emissions would be cumulatively considerable, resulting in significant adverse cumulative air quality impacts to the region's existing air quality conditions. Because the proposed project would not result in emissions above the applicable thresholds of significance for ROG, NO_X, PM_{10}, or $PM_{2.5,}$ the project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or State AAQS.

Conclusion

As stated previously, the applicable regional air quality plans include the 2001 Ozone Attainment Plan and the 2017 CAP. Because the proposed project would not result in construction-related or operational emissions of criteria air pollutants in excess of BAAQMD's thresholds of significance, conflicts with or obstruction of the implementation of the applicable regional air quality plans would not occur. In addition, the project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state AAQS. Thus, a ***less-than-significant*** impact would result.

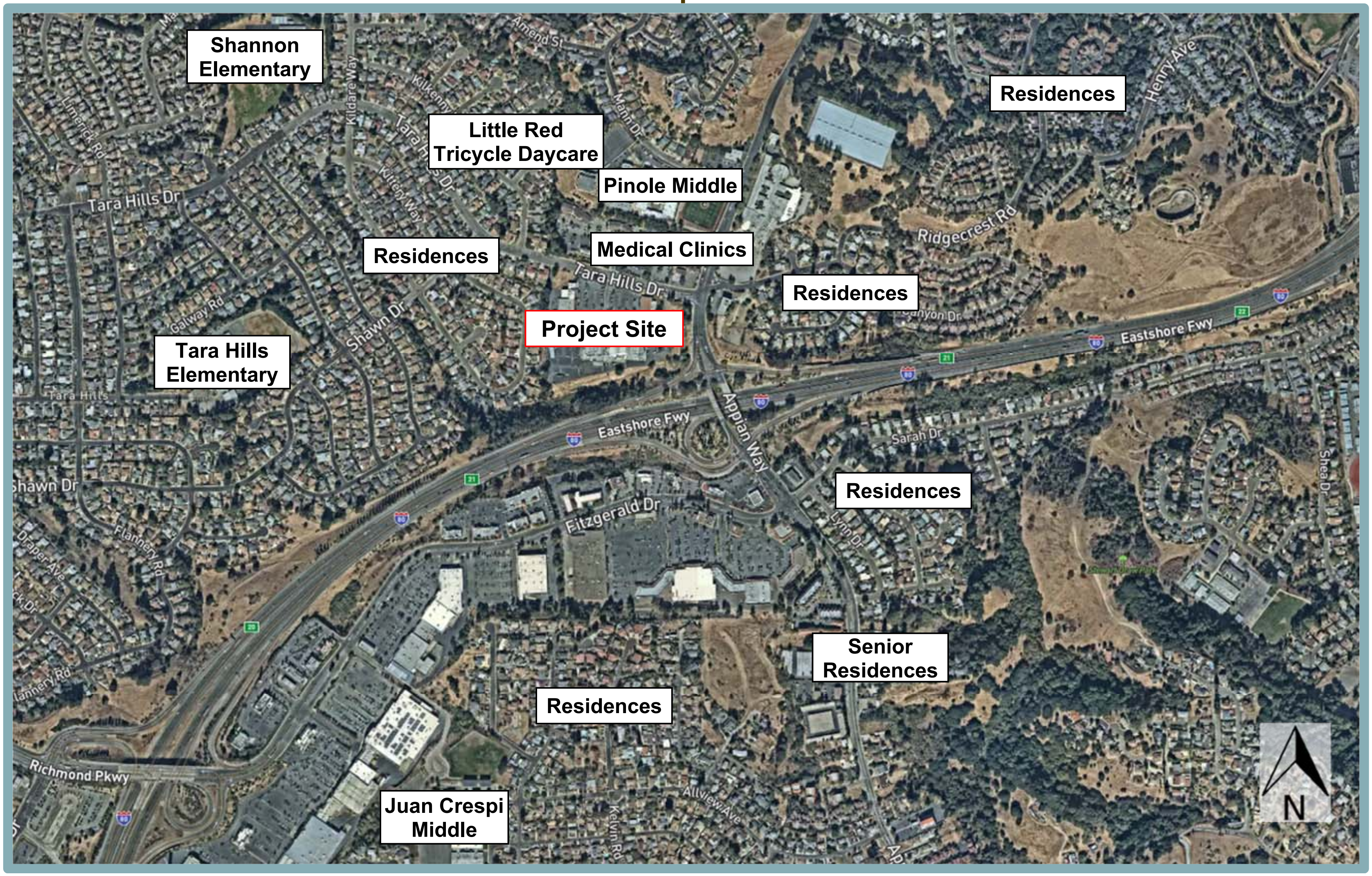
c. Some land uses are considered more sensitive to air pollution than others, due to the types of population groups or activities involved. Heightened sensitivity may be caused by health problems, proximity to the emissions source, and/or duration of exposure to air pollutants. Children, pregnant women, the elderly, and those with existing health problems are especially vulnerable to the effects of air pollution. Sensitive receptors are typically defined as facilities where sensitive receptor population groups (i.e., children, the elderly, the acutely ill, and the chronically ill) are likely to be located. Accordingly, land uses that are typically considered to be sensitive receptors include residences, schools, playgrounds, childcare centers, retirement homes, convalescent homes, hospitals, and medical clinics. The nearest existing sensitive receptors would be the residences located approximately 30 feet from the western edge of the project site (see Figure 24). Additionally, it should be noted that several schools exist within the project area, with Pinole Middle School being the closest, at a distance of approximately 450 feet. Other nearby schools include Tara Hills Elementary School, located over 1,000 feet from the project site, Shannon Elementary School, located over 2,000 feet from the site, and Juan Crespi Middle School, located approximately 2,000 feet from the site. Various medical clinics are located approximately 300 feet northeast of the site, across Tara Hills Drive.

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

Localized CO Emissions

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

Figure 24
Sensitive Receptor Locations



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

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

The proposed project would not conflict with any applicable provisions of the Contra Costa Transportation Authority (CCTA) 2019 Congestion Management Program (CMP). Based on the Transportation Impact Study prepared for the proposed project by TJKM (see Appendix G),[10] with addition of project-related trips, none of the study roadways experience traffic volumes in excess of 44,000 vehicles per hour, or 24,000 vehicles per hour where vertical air mixing is substantially impeded. As such, the proposed project would not be expected to result in substantial levels of localized CO at surrounding intersections or generate localized concentrations of CO that would exceed standards.

TAC Emissions

Another category of environmental concern is TACs. The CARB's *Air Quality and Land Use Handbook: A Community Health Perspective* (Handbook) provides recommended setback distances for sensitive land uses from major sources of TACs, including, but not limited to, freeways and high traffic roads, distribution centers, rail yards, and gas dispensing facilities (GDFs). The CARB has identified diesel particulate matter (DPM) from diesel-fueled engines as a TAC; thus, high volume freeways, stationary diesel engines, and facilities attracting heavy and constant diesel vehicle traffic are identified as having the highest associated health risks from DPM. Gasoline includes multiple TACs, which are released through various processes during the operation of GDFs. Such TACs include benzene, ethyl benzene, toluene, and xylene. Health risks associated with TACs are a function of both the concentration of emissions and the duration of exposure, where the higher the concentration and/or the longer the period of time that a sensitive receptor is exposed to pollutant concentrations would correlate to a higher health risk.

The proposed project would involve several components that would result in emissions of TACs. In particular, implementation of the proposed project would result in emissions related to project-construction, the use of heavy-duty diesel trucks to transport goods to and from the site, and operations of the proposed GDF. Each source of TACs is discussed in further depth in the sections below.

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10 TJKM. *Pinole Square, Transportation Impact Study.* October 31, 2019.

Construction Emissions

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

Because construction equipment on-site would not operate for long periods of time and would be used at varying locations within the site, associated emissions of DPM would not occur at the same location (or be evenly spread throughout the entire project site) for long periods of time. Due to the temporary nature of construction and the relatively short duration of potential exposure to associated emissions, the potential for any one sensitive receptor in the area to be exposed to concentrations of pollutants for a substantially extended period of time would be low.

Heavy-Duty Diesel Trucks On-site

Operation of the proposed retail uses and the GDF would require the movement of goods to and from the project site through the use of trucks, which would likely include heavy-duty diesel trucks. The use of diesel trucks on-site would represent a source of DPM. The CARB considers distribution centers to be significant sources of DPM due to the high volume of heavy-duty diesel vehicles used in the distribution of goods. As defined by CARB, distribution centers are facilities that serve as a distribution point for the transfer of goods. Such facilities include cold storage warehouses, goods transfer facilities, and inter-modal facilities such as ports that attract in excess of 100 heavy-duty trucks per day.

The proposed project would not be considered a distribution center, and, thus, operations of the proposed project would not be considered to involve a substantial amount of DPM emissions from heavy-duty diesel vehicles. Furthermore, the project site is currently developed with commercial retail uses; although the proposed project would result in the introduction of new types of commercial uses, which may slightly increase the number of heavy-duty diesel vehicles accessing the site, the increase would likely be minimal, and operational emissions of DPM from the site are anticipated to remain similar to existing levels of such emissions. Based on a preliminary truck delivery schedule, total daily truck traffic would involve an estimated three Safeway trucks, 10 to 15 small vendor trucks, and one to two fuel tankers. As discussed in Section XIII, Noise, of this IS/MND, worst-case hour truck traffic at the project site would involve up to four heavy-duty trucks and eight medium-duty trucks. Given the anticipated number of truck deliveries per day, operation of the proposed project would not be considered a significant source of DPM from heavy-duty vehicles per the CARB's Handbook.

Considering that the project would not be classified as a distribution center and that the proposed project would not be anticipated to substantially increase the number of heavy-duty vehicles accessing the site, implementation of the proposed project would not result in substantial emissions of DPM. Accordingly, nearby receptors would not be exposed to substantial concentrations of DPM from heavy-duty diesel trucks.

GDF Operations

As noted previously, GDFs are considered sources of various types of TACs. To address potential health impacts that could result from the proposed GDF (i.e., Safeway fueling station) operations upon the nearby residential neighborhood to the west, emissions of pollutants related to gasoline dispensing activities were estimated and the potential health risks were subsequently calculated. The CARB's screening threshold for GDFs is a gasoline throughput of 3.6 million gallons per year. For the purpose of this analysis, the average daily vehicle trips associated with the service station in conjunction with an average fill volume per vehicle were used to estimate an annual gasoline throughput of approximately 4.4 million gallons. Because the proposed GDF would be over the CARB's screening threshold, a detailed health risk assessment was performed, and is discussed in further detail below.

To assess the potential impacts of TACs, the BAAQMD maintains thresholds of significance for the review of local community risk and hazard impacts. The thresholds are designed to assess the impact of new sources of TACs on existing sensitive receptors. Based on the BAAQMD thresholds, the proposed project would result in a significant impact related to TACs if, due to the exposure of sensitive receptors to TACs related to operations of the GDF, nearby sensitive receptors would experience an increased cancer risk of greater than or equal to 10 in one million people, or experience a chronic or acute hazard index of greater than or equal to 1.0.[11]

Following the guidance within the BAAQMD's *Recommended Methods for Screening and Modeling Local Risks and Hazards*,[12] as well as guidance from other air districts within California such as the San Joaquin Valley Air Pollution Control District,[13] the concentrations of pollutants from operation of the GDF were calculated using the American Meteorological Society/Environmental Protection Agency (AMS/EPA) Regulatory Model (AERMOD) dispersion model. The associated cancer risk and non-cancer (chronic and acute) hazard index were calculated using the CARB's Hotspot Analysis and Reporting Program 2 Risk Assessment Standalone Tool (HARP 2 RAST),[14] which calculates the cancer and non-cancer health impacts using the risk assessment guidelines of the 2015 Office of Environmental Health Hazard Assessment (OEHHA) Guidance Manual for Preparation of Health Risk Assessments.[15] In addition to the guidance provided by the BAAQMD, further modeling guidance was obtained through the California Air Pollution Control Officers Association's (CAPCOA) Guidance document, *Gasoline Service Station Industrywide Risk Assessment Guidelines*, as well as the USEPA's *User's Guide for the AMS/EPA Regulatory Model – AERMOD*,[16] and the 2015 OEHHA Guidance Manual.

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

12 Bay Area Air Quality Management District. *Recommended Methods for Screening and Modeling Local Risks and Hazards*. May 2012.

13 San Joaquin Valley Air Pollution Control District. *Guidance for Air Dispersion Modeling*. August 2006.

14 California Air Resources Board. *User Manual for the Hotspots Analysis and Reporting Program Health Risk Assessment Standalone Tool, Version 2*. March 17, 2015.

15 Office of Environmental Health Hazard Assessment. *Air Toxics Hot Spots Program Risk Assessment Guidelines, Guidance Manual for Preparation of Health Risk Assessments* [pg. 8-18]. February 2015.

16 U.S. Environmental Protection Agency. *User's Guide for the AMS/EPA Regulatory Model – AERMOD*. September 2004.

Considering that GDFs result in the emission of various TACs, potential risks related to the exposure of receptors to benzene, ethyl benzene, toluene, and xylene were considered. As shown in Figure 24, the project site is in proximity to various receptors, with the nearest existing sensitive receptor being the residences located approximately 30 feet from the western edge of the project site. Additionally, several schools exist within the project area, with Pinole Middle School being the closest at a distance of approximately 450 feet. Other nearby schools include Tara Hills Elementary School, located over 1,000 feet from the project site, Shannon Elementary School, located over 2,000 feet from the site, and Juan Crespi Middle School, located approximately 2,000 feet from the site. Thus, pollutant concentrations at all nearby receptors were estimated. Although pollutant concentrations at all nearby receptors were estimated, for the purpose of determining potential health risks, only the highest estimated pollutant concentrations were used in calculating cancer risk and hazard indices. The receptor experiencing the highest estimated pollutant concentrations was considered to be the maximally exposed receptor, and would experience the highest potential health risks. Health risks to all other receptors would likely be lower than the health risks to the maximally exposed receptor, because all other receptors would be exposed to lower concentrations of GDF related pollutants as compared to the maximally exposed receptor. Considering that both schools and residences exist in proximity to the project site, the estimation of health risks conservatively assumed that nearby receptors would be continuously exposed to pollutants from the GDF at the maximum estimated concentrations. By using the maximum estimated concentrations and assuming continuous exposure to pollutants, the estimated health risks are considered a worst-case estimate of potential health risks, and actual health risks to receptors in the project area would likely be lower than the levels presented within this analysis.

Table 5 presents the combined cancer risks and non-cancer hazard indexes for the foregoing pollutants. It should be noted that the cancer risks and non-cancer hazard indexes presented in Table 5 represent the risks over a 30-year exposure period.

Table 5
Maximum Cancer Risk and Hazard Index Associated with the Proposed GDF Operations

	Cancer Risk (per million persons)	Acute Hazard Index	Chronic Hazard Index
At Maximally Exposed Receptor	3.29	0.12	0.02
Thresholds of Significance	*10*	*1.0*	*1.0*
Exceed Thresholds?	**NO**	**NO**	**NO**

Sources: AERMOD and HARP 2 RAST, December 2019 (see Appendix B).

As shown in Table 5 above, TAC emissions related to the operation of the proposed GDF would not result in health risks to the maximally exposed receptor in excess of the BAAQMD's thresholds for cancer risk and/or non-cancer hazard index.

Criteria Pollutants

The BAAQMD thresholds of significance were established with consideration given to the health-based air quality standards established by the NAAQS and CAAQS, and are designed to aid the district in achieving attainment of the NAAQS and CAAQS.[17] Although the BAAQMD's thresholds of significance are intended to aid achievement of the NAAQS and CAAQS for which the SFBAAB is in nonattainment, the thresholds of significance do not represent a level above which individual project-level emissions would directly result in public health impacts. Nevertheless, a project's compliance with BAAQMD's thresholds of significance provides an indication that criteria pollutants released as a result of project implementation would not inhibit attainment of the health-based regional NAAQS and CAAQS. Because project-related emissions would not exceed the BAAQMD's thresholds, and, thus, would not inhibit attainment of regional NAAQS and CAAQS, the criteria pollutants emitted during project implementation would not be anticipated to result in measurable health impacts to sensitive receptors. Accordingly, the proposed project would not expose sensitive receptors to excess concentrations of criteria pollutants.

Conclusion

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

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

Per the BAAQMD CEQA Guidelines, odors are generally regarded as an annoyance rather than a health hazard.[18] Manifestations of a person's reaction to odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache). The presence of an odor impact is dependent on a number of variables including: the nature of the odor source; the frequency of odor generation; the intensity of odor; the distance of odor source to sensitive receptors; wind direction; and sensitivity of the receptor.

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

Construction activities often include diesel-fueled equipment and heavy-duty trucks, which could create odors associated with diesel fumes that may be considered objectionable. However, construction activities would be temporary, and hours of operation for construction equipment would be restricted to the hours of 7:00 AM and 5:00 PM Monday through Friday on non-federal holidays, and 9:00 AM to 6:00 PM on Saturdays as long as it is interior work and does not generate significant noise per Section 15.02.070 of the City of Pinole Municipal Code. Project construction would also be required to comply with all applicable BAAQMD rules and regulations, particularly associated with permitting of air

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17 Bay Area Air Quality Management District. *California Environmental Quality Act Air Quality Guidelines*. May 2017.
18 *Ibid.*

pollutant sources. The aforementioned regulations would help to minimize emissions, including emissions leading to odors. Accordingly, substantial objectionable odors would not be expected to occur during construction activities.

Operations of the proposed restaurant uses would have the potential to result in emissions of odors related food preparation and disposal. In particular, preparation of oily food, some baking processes, and cooking using charbroiling grills may create odorous emissions. However, commercial kitchens and cooking areas are required to comply with state and local regulations associated with cooking equipment and controls, such as grease filtration and removal systems, exhaust hood systems, and blowers to move air into the hood systems, through air cleaning equipment, and then outdoors. Such equipment would ensure that pollutants associated with smoke and exhaust from cooking surfaces would be captured and filtered, allowing only filtered air to be released into the atmosphere. In addition, the disposal of solid waste, including putrescible waste, such as food waste, is regulated under Chapter 8.08, Solid Waste, of the City's Municipal Code. Section 8.08.040 of the Municipal Code requires that waste be collected and properly disposed of at least as frequently as every seven days. The collection of such waste in a timely manner would ensure that food waste does not decompose and create substantial objectionable odors. In addition, Section 8.08.080 requires property owners to maintain sanitary solid waste receptacles, and Section 8.08.090 requires the property owners to subscribe to and pay for necessary solid waste collection service.

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

As noted previously, all projects under the jurisdiction of BAAQMD are required to implement the BAAQMD's Basic Construction Mitigation Measures. Such measures would act to reduce construction-related dust by ensuring that haul trucks with loose material are covered, reducing vehicle dirt track-out, and limiting vehicle speeds within project site, among other methods, which would ensure that construction of the proposed project does not result in substantial emissions of dust. Following project construction, vehicles operating within the project site would be limited to paved areas of the site, and non-paved areas would be landscaped. Thus, project operations would not include sources of dust that could adversely affect a substantial number of people.

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

IV. BIOLOGICAL RESOURCES. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	✖	☐	☐
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	✖	☐
c. Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	✖	☐
d. Interfere substantially with the movement of any resident or migratory fish or wildlife species or with established resident or migratory wildlife corridors, or impede the use of wildlife nursery sites?	☐	☐	✖	☐
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	✖	☐	☐
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	✖

Discussion

a. Currently, the project site consists of a commercial shopping center. With the exception of a 15,214-sf parcel located to the northwest of the existing Bank of America Building (1201 Tara Hills Drive) and a rectangular area located directly to the north of the existing China Delight restaurant, the project site is developed with impervious surfaces and landscaping features. The undeveloped areas have both been subject to prior grading and, thus, are heavily disturbed. As part of Phase I, the proposed project would include removal of 44 of the 45 existing on-site trees, construction of parking lot improvements throughout the project site, and demolition of a portion of the existing on-site buildings. The unimproved 15,214-sf parcel within the northern portion of the site would be developed with parking spaces, landscaping and hardscape features, and a bus pocket. Upon completion of Phases I and II, the rectangular parcel located north of the existing China Delight restaurant would remain vacant and undeveloped.

Special-status species include plant and wildlife species that are listed as endangered or threatened, or are candidates for this listing under the Federal and State Endangered Species Acts. 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 (FESA);
- Species that are listed, or designated as candidates for listing, as rare, threatened, or endangered under the California Endangered Species Act (CESA);
- Plant species that are on the California Rare Plant Society (CNPS) Rank 1 and 2;

- Animal species that are designated as Species of Special Concern or Fully Protected by the California Department of Fish and Wildlife (CDFW); and
- Species that meet the definition of rare, threatened, or endangered under Section 15380 of the CEQA guidelines.

In addition to regulations for special-status species, most birds in the U.S., including non-status species, are protected by the Migratory Bird Treaty Act (MBTA) of 1918. Under the MBTA, destroying active nests, eggs, and young is illegal.

As noted above, the project site is currently developed with a shopping center. Thus, the potential for special-status species to occur on-site is very low. Nonetheless, given that the site contains two areas that are not currently developed with impervious surfaces, Raney Planning & Management, Inc. conducted a search of the California Natural Diversity Database (CNDDB) maintained by the CDFW for the project site quadrangle, the Richmond quadrangle, in order to identify documented occurrences of special-status species in the vicinity of the project area. Each species identified by CNDDB within the Richmond quadrangle was evaluated to determine the location of the species relative to the project site, as well as whether the site meets the habitat requirements of each species. Based on the results of the CNDDB search, a total of 13 special-status plant species and 19 special-status wildlife species are known to occur within the project region.

Of the 13 special-status plant species, none are likely to occur on the project site due to the developed/disturbed nature of the site and area, as well as habitat requirements that are not present on-site (i.e., salt marshes, woodland, forest, chaparral, etc.). It should be noted that Santa Cruz tarplant has been documented to the south of the site across I-80 (approximately 0.11-mile from the site boundary) and approximately 1.2 miles west of the site near Crestwood Drive. However, such occurrences are from 1982 and 1993, respectively, and predate extensive development that has since occurred in both areas. Due to the disturbed nature of the site and the absence of potentially suitable habitat, special-status plants are not anticipated to be present on the site. Thus, the proposed project would not result in substantial adverse effects to special-status plant species.

Of the 19 special-status wildlife species, 16 are unlikely to occur on the project site due to habitat requirements, including, but not limited to, aquatic features, forest, marsh, and chaparral. However, the existing on-site trees, as well as brush within the unimproved parcel located within the northern portions of the site, could provide potential nesting habitat for white-tailed kite, as well as nesting and migratory birds protected by the MBTA. In addition, pallid bat and Townsend's big-eared bat have the potential to roost in on-site tree cavities or within existing on-site buildings proposed for demolition as part of the project.

Based on the above, the proposed project would not result in any impacts to special-status plant species. However, the potential exists for construction activities to result in adverse effects to select special-status wildlife species. Therefore, the proposed project could result in a ***potentially significant*** impact related to species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW or U.S. Fish and Wildlife Service.

Mitigation Measure(s)

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

White-Tailed Kite and Nesting and Migratory Birds

IV-1 *The project applicant shall implement the following measures prior to initiation of demolition activities, tree removal, or other ground-disturbing activities:*

- *If any site disturbance or construction activity for any phase of development begins outside the February 1 to August 31 breeding season, a preconstruction survey for active nests shall not be required.*
- *If any site disturbance or construction activity for any phase of development is scheduled to begin between February 1 and August 31, a qualified biologist shall conduct a preconstruction survey for active nests from publicly accessible areas within 14 days prior to site disturbance or construction activity for any phase of development. The survey area shall cover the construction site and the area surrounding the construction site, including a 50- to 100-foot radius for MBTA birds, and a 250-foot radius for birds of prey, if accessible. If an active nest of a bird of prey, MBTA bird, or other protected bird is not found, then further mitigation measures shall not be necessary. The results of the preconstruction survey shall be submitted to the City of Pinole Community Development Department for review.*
- *If an active nest of a bird of prey, MBTA bird, or other protected bird is discovered that may be adversely affected by any site disturbance or construction, or an injured or killed bird is found, the project applicant shall comply with the following measures:*
    - *Notify the City of Pinole Community Development Department.*
    - *The biologist shall establish a minimum 250-foot Environmentally Sensitive Area (ESA) around the nest if the nest is of a bird of prey, and a 50- to 100-foot ESA around the nest if the nest is of an MBTA bird other than a bird of prey. The ESA may be reduced if the biologist determines that a smaller ESA would still adequately protect the active nest. Work may not occur within the ESA until the biologist determines that the nest is no longer active.*

Roosting Bats

IV-2 *The project applicant shall implement the following measures prior to initiation of demolition activities or tree removal:*

- *A qualified biologist shall conduct a pre-construction survey for roosting bats at the project site within 14 days prior to initiation of building demolition or tree removal at the project site.*

- *Survey results shall be submitted to the City of Pinole. If active maternity bat roosts are not found within the survey area, further mitigation is not required.*
- *If active bat roosts are found, the biologist shall identify a suitable construction-free buffer around the maternity roost. An example of a suitable construction free buffer is 50 feet; however, each buffer distance should be determined on a case-by-case basis by the qualified biologist. The buffer shall be identified on the ground with flagging or fencing, and shall be maintained until a qualified biologist has determined that the tree and snag impacts would not adversely affect bat survival or survival of their young.*

b,c Currently, the project site is developed with a commercial shopping center. The project site does not include any existing wetlands, waterways, or other sensitive habitat. It should be noted that an existing gully is located to the south of the site, between the southern site boundary and I-80. However, while the proposed on-site renovations would include paving activities uphill from the gully, the project would be required to comply with various Best Management Practices to be described in the Storm Water Pollution Prevention Plan (SWPPP) to be prepared for the site, as discussed in Section X of this IS/MND. Such Best Management Practices would prevent the discharge of polluted runoff to the gully. Therefore, the proposed project would not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFW or U.S. Fish and Wildlife Service, or on State or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.). Thus, a ***less-than-significant*** impact would occur.

d. The project site is currently developed with commercial buildings, a parking lot, and associated improvements. In addition, the site is bordered by existing development to the north, east, and west. I-80 is located approximately 150 feet to the south of the site. Thus, the project site does not support any substantial wildlife movement corridors. The project site does not contain streams or other waterways that could be used by migratory fish or as a wildlife corridor for other wildlife species. While an existing gully is located to the south of the site, the proposed on-site renovations would not include any construction activities within close proximity to the gully. Thus, the proposed project would not result in any effects related to wildlife movement associated with the feature. As such, the project would not interfere substantially with the movement of any resident or migratory fish or wildlife species or with established resident or migratory wildlife corridors, or impede the use of wildlife nursery sites, and a ***less-than-significant*** impact would occur.

e. Per the City of Pinole's Tree Removal Ordinance, as included in Chapter 17.96 of the Municipal Code, trees that are considered "protected" are defined as follows:

- Trees with a single perennial stem of 12 inches or larger in circumference (four inches in diameter) measured at 4.5 feet above grade, of the following species: Coast live oak, Madrone, Buckeye, Black Walnut, Redwood, Big Leafed Maple, Redbud, California Bay, Toyon; and
- Any other tree with a single stem greater than 56" or larger in circumference (18" in diameter) and 4.5 feet above the natural grade; nut and fruit trees, palms, and eucalyptus are not protected.

In order to evaluate the eligibility of the existing on-site trees for protection under the Tree Removal Ordinance, an Arborist Report was prepared for the proposed project by HortScience, Inc. (see Appendix B).[19] As part of the Arborist Report, all on-site trees with diameters measuring six inches or greater at 4.5 feet above grade, or four inches or greater for native species, were surveyed, tagged with an identifying number, and evaluated for health and structural condition.

A total of 70 trees were assessed, including 45 on-site trees and 25 off-site trees, representing 25 species. All on-site trees were determined to be planted as landscaping features, rather than indigenous to the site. A total of 61 of the 70 trees were rated as “fair” condition; three were rated as “poor”, and six were rated as “good”. HortScience, Inc. determined that 42 of the 70 surveyed trees are protected by the City’s Municipal Code. Of the 42 protected trees, 23 are located off-site.

As part of the proposed project, removal of 44 of the 45 existing on-site trees sized six inches or larger (four inches or larger for native trees) would be required in order to accommodate the proposed renovations; 19 of the trees proposed for removal are considered protected. The 23 protected trees located off-site, adjacent to the western site boundary, would be retained, as well as one existing on-site protected tree located along the eastern site frontage at Tara Hills Drive. Chapter 17.96 of the City’s Municipal Code requires a tree removal permit be obtained prior to removal of any protected trees, as well as tree replacement at a ratio of 1:1.

Considering the above, the proposed project could conflict with the City’s Tree Protection Ordinance, which would be considered a ***potentially significant*** impact.

Mitigation Measures

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

IV-3 *Removal of protected trees shall comply with the tree removal permit requirements outlined in Section 17.96.060 of the Pinole Municipal Code, as follows:*

1. *The project applicant shall file an application for a tree removal permit with the Development Services Department for all 19 protected trees proposed for removal as part of the proposed project. The applicant shall file the application concurrently with submittal of final construction drawings.*

2. *The application shall contain the precise number, species, size and location of the protected tree(s) to be cut down, destroyed, or removed and a statement of the reason for removal, the signature of the property owner authorizing such removal, the signature of the person actually performing the work if different than the property owner and if known at the time of the application, as well as any other pertinent information the Development Services Department may require. The applicant shall submit five copies of drawing and*

[19] HortScience, Inc. *Arborist Report, Pinole Square, CA.* October 2017.

a fee prescribed by City Council resolution to cover the cost of investigation and processing.

3. *Any tree removed shall be replaced in accordance with Section 17.44.070 of the City's Zoning Ordinance, at the expense of the project applicant.*

4. *The project applicant shall provide a tree survey plan specifying the precise location and dripline of all existing trees (protected trees and non-protected trees) on the property.*

For the single protected tree to be retained (identified as Tree #3 in the 2017 Arborist Report prepared for the proposed project by HortScience, Inc.), ongoing maintenance of the tree shall comply with the tree preservation requirements outlined in Section 17.96.070 of the Pinole Municipal Code, as follows:

1. *Prior to and during any demolition, grading or construction, all protected trees within a development area shall be protected by a six (6) foot high chain link (or other material approved by the Development Services Department) fence installed around the outside of the dripline of each tree.*

2. *No oils, gas, chemicals, liquid waste, solid waste, heavy construction machinery or other construction materials shall be stored or allowed to stand within the dripline of any tree.*

3. *No equipment washout will be allowed to occur within the dripline of any tree.*

4. *No signs or wires, except those needed for support of the tree, shall be attached to any tree. Should protected trees be damaged, the developer, contractor, or any agent thereof shall comply with the requirements outlined in Section 17.96.090 of the Pinole Municipal Code, as described below.*

5. *If any damage occurs to a protected tree during construction, the developer, contractor, or any agent thereof shall immediately notify the Development Services Department so that professional methods of treatment accepted by the Development Services Department may be administered. The repair of the damage shall be at the expense of the responsible party and shall be by professional standards, approved by the Development Services Department. Failure to comply shall result in a stop work order.*

f. The project site is not located within an area that is subject to an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan. Therefore, the proposed project would have ***no impact*** related to a conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan.

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

Discussion

a. Historical resources are features that are associated with the lives of those of historical significance and/or particular significant events. Various characteristics of the type of significance, or method of construction may be likely to yield important information about the history of the local area. The City's General Plan and the General Plan EIR provide a list of historic buildings in the City of Pinole.[20] In addition, The National Register of Historic Places (NRHP) lists multiple historic buildings, districts, events, and artifacts found in Contra Costa County. Examples of structures having identified cultural significance in the City of Pinole are the Bank of Pinole and the Fernandez Mansion. The Bank of Pinole is located approximately one mile east and the Fernandez Mansion is located approximately one-mile northeast of the proposed project site.

A records search of the California Historic Resources Information System (CHRIS) was performed by the Northwest Information Center for cultural resource site records and survey reports within the project area.[21] Based on the results of the CHRIS search, per the State Office of Historic Preservation Directory (which includes listings of the California Register of Historical Resources, California State Historical Landmarks, California State Points of Historical Interest, and the National Register of Historic Places), listed recorded buildings or structures do not occur in or adjacent to the project site.

The project site is currently developed with the Appian 80 Shopping Center, which includes a Safeway grocery store, a vacant CVS pharmacy, and various other smaller businesses. The structures were developed between 1968 and 1993, with various renovations and demolition activities occurring up to 1998. Structures that are 50 years of age or older may be eligible for consideration as historic resources under the California Register of Historic Places (CRHP). The CRHR eligibility criteria include the following per CEQA Guidelines Section 15064.5(a)(3):

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

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20 City of Pinole. *General Plan Update Draft Environmental Impact Report, SCH #2009022057.* July 2010.

21 Northwestern Information Center. *Record search results for the proposed Pinole Square Project at 1200-1577 Tara Hills Drive, Pinole, CA.* August 20, 2019.

In addition, the resource must retain integrity. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association.

While a portion of the on-site structures may be at least 50 years old, none of the existing structures are known to be associated with any significant historical events in the project region or California, and the structures are not likely to yield information important to the prehistory or history of the local area, California, or the nation. In addition, the structures have not been occupied or owned by any persons important to local, State, or national history, and do not possess any unique architectural elements. Many of the structures are vacant and dilapidated. Therefore, the existing on-site structures are not eligible for consideration as historical resources per the CRHR eligibility criteria, and, thus, would not be considered historical resources.

Based on the above, the proposed project would not cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5, and a ***less-than-significant*** impact would occur.

b,c. According to the CHRIS search, the project site has been subject to one cultural resource study, conducted in 2011, that covered approximately half of the site. The study did not identify any recorded archaeological resources within the project site. In addition, a search of the Native American Heritage Commission (NAHC) Sacred Lands File yielded negative results.[22] The site has been subject to extensive disturbance associated with development of the existing on-site structures, parking areas, and associated improvements. However, per the CHRIS search, a moderate potential exists for unrecorded archaeological resources or Native American tribal cultural resources to occur within the project area.

Based on the above, unknown archaeological resources, including human remains, have the potential to be uncovered during ground-disturbing construction and excavation activities at the project site. If previously unknown resources are encountered during construction activities, the proposed project could cause a substantial adverse change in the significance of a unique archaeological resource pursuant to CEQA Guidelines Section 15064.5 and/or disturb human remains, including those interred outside of dedicated cemeteries, during construction. Therefore, impacts could be considered ***potentially significant***.

Mitigation Measure(s)

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

V-1 *In the event a potentially significant cultural resource is encountered during subsurface earthwork activities, all construction activities within a 100-foot radius of the find shall cease and workers should avoid altering the materials until an archaeologist who meets the Secretary of Interior's Professional Qualification Standards for archaeology has evaluated the find. The Applicant shall include a standard inadvertent discovery clause in every construction contract to inform contractors of this requirement. The qualified archeologist shall make recommendations to the Lead Agency on the measures that shall be implemented to protect the discovered*

22 Native American Heritage Commission. *Pinole Square Project, City of Pinole; Richmond USGS Quadrangle, Contra Costa County, California.* July 30, 2019.

resources, including but not limited to, culturally appropriate temporary and permanent treatment, which may include avoidance of cultural resources, in-place preservation, and/or re-burial on project property so the resource(s) are not subject to further disturbance in perpetuity. If avoidance is determined to be infeasible, pursuant to CEQA Guidelines Section 15126.4(b)(3)(C), a data recovery plan, which makes provisions for adequately recovering the scientifically consequential information from and about the historical resource, shall be prepared and adopted prior to any excavation being undertaken. Such studies shall be deposited with the California Historical Resources Regional Information Center. If necessary, excavation and evaluation of the finds shall comply with Section 15064.5 of the CEQA Guidelines.

Potentially significant cultural resources include, but are not limited to, stone, bone, glass, wood, or shell artifacts or features, including hearths, structural remains, or historic dumpsites. Any previously undiscovered resources found during construction within the project site shall be recorded on appropriate Department of Parks and Recreation (DPR) 523 forms and will be submitted to the City of Pinole, the Northwest Information Center, and the State Historic Preservation Office (SHPO), as required.

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

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

Discussion

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

California Green Building Standards Code

The 2019 CBSC, otherwise known as the CAL Green Code (CCR Title 24, Part 11), became effective on January 1, 2020.[23] The purpose of the CAL Green Code is to improve public health, safety, and general welfare by enhancing the design and construction of buildings through the use of building concepts having a reduced negative impact or positive environmental impact and encouraging sustainable construction practices. The CBSC standards regulate the method of use, properties, performance, types of materials used in construction, alteration repair, improvement and rehabilitation of a structure or improvement to property. The provisions of the code apply to the planning, design, operation, construction, use, and occupancy of every newly constructed building or structure throughout California. Requirements of the CALGreen Code include, but are not limited to, the following measures:

- Compliance with relevant regulations related to future installation of Electric Vehicle charging infrastructure in non-residential structures;
- Indoor water use consumption is reduced through the establishment of maximum fixture water use rates;
- Outdoor landscaping must comply with the California Department of Water Resources' Model Water Efficient Landscape Ordinance (MWELO), or a local ordinance, whichever is more stringent, to reduce outdoor water use;
- Diversion of 65 percent of construction and demolition waste from landfills;
- Mandatory periodic inspections of energy systems (i.e., heat furnace, air conditioner, mechanical equipment) for nonresidential buildings over 10,000 sf to ensure that all are working at their maximum capacity according to their design efficiencies; and
- Mandatory use of low-pollutant emitting interior finish materials such as paints, carpet, vinyl flooring, and particle board.

Building Energy Efficiency Standards

The 2019 Building Energy Efficiency Standards were implemented as the new standard for all development on January 1, 2020. The new non-residential building standards

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

enable the use of highly efficient air filters and improve ventilation systems, as well as lighting improvements, requiring approximately 30 percent less energy than those built under the previous 2016 standards.

Construction Energy Use

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

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

The CARB has prepared the 2017 Climate Change Scoping Plan Update (2017 Scoping Plan),[24] which builds upon previous efforts to reduce GHG emissions and is designed to continue to shift the California economy away from dependence on fossil fuels. Appendix B of the 2017 Scoping Plan includes examples of local actions (municipal code changes, zoning changes, policy directions, and mitigation measures) that would support the State's climate goals. The examples provided include, but are not limited to, enforcing idling time restrictions for construction vehicles, utilizing existing grid power for electric energy rather than operating temporary gasoline/diesel-powered generators, and increasing use of electric and renewable fuel-powered construction equipment. The In-Use Off Road regulation described in the Air Quality section of this IS/MND, with which the proposed project must comply, would be consistent with the intention of the 2017 Scoping Plan and the recommended actions included in Appendix B of the 2017 Scoping Plan.

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

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[24] California Air Resources Board. *The 2017 Climate Change Scoping Plan Update.* November, 2017.

Operational Energy Use

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

The proposed project would be subject to all relevant provisions of the most recent update of the CBSC, including the Building Energy Efficiency Standards. Adherence to the most recent CALGreen Code and the Building Energy Efficiency Standards would ensure that the proposed structures would consume energy efficiently through the incorporation of such features as door and window interlocks, direct digital controls for HVAC systems, and high efficiency outdoor lighting. For example, all lighting fixtures to be included in the project would be high-efficiency LED. Required compliance with the CBSC would ensure that the building energy use associated with the proposed project would not be wasteful, inefficient, or unnecessary. In addition, electricity supplied to the project by PG&E would comply with the State's Renewable Portfolio Standard (RPS), which requires investor-owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources to 33 percent of total procurement by 2020 and to 60 percent by 2030. Thus, a portion of the energy consumed during project operations would originate from renewable sources.

Due to the age of the existing buildings, redevelopment of the site and compliance with the more stringent Building Energy Efficiency Standards currently in place would result in less energy consumption than what currently occurs on the site.

Conclusion

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

VII. GEOLOGY AND SOILS. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	✖	☐
ii. Strong seismic ground shaking?	☐	☐	✖	☐
iii. Seismic-related ground failure, including liquefaction?	☐	☐	✖	☐
iv. Landslides?	☐	☐	✖	☐
b. Result in substantial soil erosion or the loss of topsoil?	☐	☐	✖	☐
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	✖	☐	☐
d. Be located on expansive soil, as defined in Table 18-1B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	✖	☐	☐
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	✖
f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	✖	☐	☐

Discussion

ai-ii. As noted in the City of Pinole General Plan EIR, sufficiently active faults are defined as faults that have evidence of surface displacement within the last 10,000 years.[25] The nearest active faults relative to the City's Planning Area are the Pinole Fault, located approximately 0.9-mile east of the project site, and the Hayward Fault, located approximately 1.5 to 3.9 miles west of the City.[26] Known active or potentially active faults do not exist on the project site. In addition, per the City of Pinole General Plan, the City is not located within a State-designated Alquist-Priolo Fault Zone. Thus, the potential for fault rupture risk at the project site is relatively low.

Earthquakes of moderate to high magnitude generated by the above faults could cause considerable ground shaking at the project site. However, proper engineering of the proposed buildings in compliance with the standards included in the 2019 CBSC would ensure that the project would not be subject to substantial risks related to seismic ground shaking. Conformance with the design standards is enforced through building plan review and approval by the City to ensure proper engineering of the buildings to reduce the risks related to seismic ground shaking to the extent feasible. Based on the above, a ***less-than-significant*** impact would occur related to seismic surface rupture and strong seismic ground shaking.

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25 City of Pinole. *General Plan Update Draft Environmental Impact Report, SCH #2009022057.* July 2010.
26 City of Pinole. *General Plan Update, Draft Environmental Impact Report* [Figure 4.8-2]. 2010.

aiii-aiv. Liquefaction is a phenomenon in which granular material is transformed from a solid state to a liquefied state as a consequence of increased pore-water pressure and reduced effective stress. Increased pore-water pressure is induced by the tendency of granular materials to densify when subjected to cyclic shear stresses associated with earthquakes. Per the General Plan EIR, based upon known soil, groundwater, and ground shaking conditions within the City's Planning Area, the potential for liquefaction within the Planning Area is considered low.[27]

As part of a Geotechnical Investigation prepared for the proposed project by Cornerstone Earth Group (see Appendix C), the project site was screened for liquefaction potential by retrieving samples from the site, performing visual classification of sampled materials, and performing various tests to further classify soil properties.[28] Based on the results of the screening analysis, the soils within the project site have a low potential for liquefaction. Thus, the proposed structures would not be subject to substantial risk from seismically induced liquefaction.

Seismically-induced landslides may be triggered by both natural and human induced changes to the environment, which can create slope instability. The risk of landslide hazard is greatest in areas with steep, unstable slopes. South of the southern site boundary, the ground surface slopes downward, creating a wide gully between the project site and I-80. However, the proposed project would not involve any work within the southern slope areas. In addition, the site has been subject to prior grading and development associated with the Appian 80 Shopping Center. The proposed project would not include any modifications that would result in substantially increased landslide risk relative to existing conditions.

Based on the above, seismically induced landslides and liquefaction would not be likely to pose a risk to the proposed project. Thus, a ***less-than-significant*** impact would occur.

b. Issues related to erosion are discussed in Section X, Hydrology and Water Quality, of this IS/MND. As noted therein, with implementation of Mitigation Measure X-1 the proposed project would not result in substantial soil erosion or the loss of topsoil. Thus, a ***less-than-significant*** impact would occur.

c,d. As noted above, the proposed project would not be subject to substantial risks related to landslide or liquefaction. Issues related to lateral spreading, subsidence, collapse, and expansive soils are discussed below.

Lateral spreading is horizontal/lateral ground movement of relatively flat-lying soil deposits towards a free face such as an excavation, channel, or open body of water; typically, lateral spreading is associated with liquefaction of one or more subsurface layers near the bottom of the exposed slope. Per the Geotechnical Investigation, given that the potential for liquefaction at the project site is relatively low, the potential for lateral spreading to affect the proposed project is also low.

As noted in the Geotechnical Investigation, loose, unsaturated, sandy soils have the potential to settle during strong seismic shaking. Based on the stiff to very stiff clays and

27 City of Pinole. *General Plan Update Draft Environmental Impact Report, SCH #2009022057.* July 2010.

28 Cornerstone Earth Group. *Design-Level Geotechnical Investigation, Pinole Square Shopping Center, 1421 Tara Hills Drive, Pinole, California.* October 31, 2019.

medium dense to dense sands encountered on-site by Cornerstone Earth Group, the potential for substantial differential seismic settlement to affect the proposed improvements is low. However, as discussed in greater detail in Section IX, Hazards and Hazardous Materials, former Underground Storage Tank (UST) locations on the project site have been subject to prior backfilling associated with UST removal. Such fill is considered undocumented and may be susceptible to densification following potential future strong ground shaking in the project region. Such undocumented soils would require removal and replacement with compacted fill.

Expansive soils can undergo significant volume change with changes in moisture content. Specifically, such soils shrink and harden when dried and expand and soften when wetted. Per the Geotechnical Investigation, moderately expansive to highly expansive surficial soils were encountered at varying depths throughout the project site. To reduce the potential for damage of the proposed structures, slabs-on-grade would require sufficient reinforcement and support by a layer of non-expansive fill, with footings extending below the zone of seasonal moisture fluctuation. In the absence of project-specific design considerations, a potentially significant impact could occur related to expansive soils.

Based on the above, the proposed project could be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and could be located on expansive soil, as defined in Table 18-1B of the Uniform Building Code. Thus, a ***potentially significant*** impact could occur.

Mitigation Measure(s)

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

VII-1 *All grading and foundation plans for the proposed project shall be designed by a Civil and Structural Engineer and reviewed and approved by the Director of Public Works/City Engineer, Chief Building Official, and a qualified Geotechnical Engineer prior to issuance of grading and building permits to ensure that all geotechnical recommendations specified in the Geotechnical Investigation are properly incorporated and utilized in the project design, including recommendations related to undocumented fill, and expansive soils.*

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

f. The City's General Plan does not note the existence of any unique geologic features within the City. Consequently, implementation of the proposed project would not be anticipated to have the potential to result in direct or indirect destruction of unique geologic features.

The City's General Plan indicates that known paleontological resources do not exist within the City Planning Area. However, development allowed under the General Plan could result in the discovery and disturbance of previously unknown or undiscovered paleontological resources. As noted in the City's General Plan EIR,[29] paleontological resources include fossilized remains of vertebrate and invertebrate organisms, fossil tracks and trackways, and plant fossils. A unique paleontological site would include a known area of fossil bearing rock strata.

Although the proposed project is not anticipated to have the potential to result in the destruction of unique geologic features, previously unknown paleontological resources could exist within the project site. Thus, ground-disturbing activity associated with the proposed project, including grading and trenching, would have the potential to disturb or destroy such resources if present. Therefore, the proposed project could result in the direct or indirect destruction of a unique paleontological resource, and a ***potentially significant*** impact could occur.

Mitigation Measure(s)

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

VII-2 *Should construction or grading activities result in the discovery of unique paleontological resources, all work within 100 feet of the discovery shall cease. Examples of paleontological resources can include, but are not limited to, vertebrate fossils (e.g., teeth, bones), unusually large or dense accumulations of intact invertebrates, and well-preserved plant material (e.g., leaves). The Community Development Department shall be notified, and the resources shall be examined by a qualified archaeologist, paleontologist, or historian, at the developer's expense, for the purpose of recording, protecting, or curating the discovery as appropriate. The archaeologist, paleontologist, or historian shall submit to the Community Development Department for review and approval a report of the findings and method of curation or protection of the resources. Work may only resume in the area of discovery when the preceding work has occurred.*

29 City of Pinole. *General Plan Update Draft Environmental Impact Report, SCH #2009022057.* July 2010.

VIII. GREENHOUSE GAS EMISSIONS. *Would the project:*	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	✖	☐	☐
b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gasses?	☐	✖	☐	☐

Discussion

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

Implementation of the proposed project would cumulatively contribute to increases of GHG emissions. Estimated GHG emissions attributable to future development would be primarily associated with increases of carbon dioxide (CO_2) and, to a lesser extent, other GHG pollutants, such as methane (CH_4) and nitrous oxide (N_2O) associated with area sources, mobile sources or vehicles, utilities (electricity and natural gas), water usage, wastewater generation, and the generation of solid waste. The primary source of GHG emissions for the project would be mobile source emissions. The common unit of measurement for GHG is expressed in terms of annual metric tons of CO_2 equivalents (MTCO$_2$*e*/yr).

The BAAQMD developed a threshold of significance for project-level GHG emissions in 2009. The District's approach to developing the threshold was to identify a threshold level of GHG emissions for which a project would not be expected to substantially conflict with existing California legislation. At the time that the thresholds were developed, the foremost legislation regarding GHG emissions was AB 32, which established an emissions reductions goal of reducing statewide emissions to 1990 levels by 2020.[30] The GHG emissions threshold of significance recommended by BAAQMD to determine compliance with AB 32 is 1,100 MTCO$_2$*e*/yr. If a project generates GHG emissions above the BAAQMD's adopted threshold level, the project is considered to generate significant GHG emissions and conflict with AB 32.

It should be noted that the foregoing threshold is intended for use in assessing operational GHG emissions only. Construction of a proposed project would result in GHG emissions over a short-period of time in comparison to the operational lifetime of the project. To capture the construction-related GHG emissions due to buildout of the proposed project, such emissions are amortized over the duration of the construction period and added to the operational GHG emissions. Given that construction-related GHG emissions would

30 Bay Area Air Quality Management District. *California Environmental Quality Act Guidelines Update: Proposed Thresholds of Significance*. December 7, 2009.

not occur concurrently with operational emissions and would cease upon completion of construction activities, combining the two emissions sources represents a conservative estimate of total project GHG emissions.

Since the adoption of BAAQMD's GHG thresholds of significance, the State legislature has passed SB 32, which builds upon AB 32 and establishes a statewide GHG reduction target of 40 percent below 1990 levels by 2030. Considering the legislative progress that has occurred regarding statewide reduction goals since the adoption of BAAQMD's standards, the emissions thresholds presented above would determine whether a proposed project would be in compliance with the 2020 emissions reductions goals of AB 32, but would not necessarily demonstrate whether a project would be in compliance with SB 32. In accordance with the changing legislative environment, the BAAQMD has begun the process of updating their CEQA Guidelines; however, updated GHG thresholds of significance have not yet been adopted. Consequently, the GHG emissions resulting from the proposed project have been assessed in relation to other existing statewide, regional, and Citywide plans related to climate change, including the 2017 Scoping Plan, Plan Bay Area 2040, and applicable City General Plan goals and policies.

Based on the above, project-related GHG emissions have been quantitatively assessed in comparison to BAAQMD's adopted emissions thresholds for compliance with AB 32, and qualitatively assessed in comparison with the recommended mitigation measures in the 2017 Scoping Plan for compliance with SB 32. In addition, the project's consistency with the goals of the Plan Bay Area 2040 and applicable goals and policies of the City's General Plan is discussed.

BAAQMD Thresholds

Construction GHG emissions are a one-time release and are, therefore, not typically expected to generate a significant contribution to global climate change. Neither the City nor BAAQMD has an adopted threshold of significance for construction-related GHG emissions and does not require quantification. Nonetheless, the proposed project's construction GHG emissions have been estimated. The proposed project's construction-related and operational GHG emission estimations were conducted using CalEEMod and the same assumptions discussed in Section III, Air Quality, of this IS/MND, and are included in Appendix A. In addition, compliance with the State's RPS was assumed in the modeling. The emissions estimates prepared for the proposed project determined that unmitigated project construction would result in total GHG emissions of 1,093.46 MTCO$_2$*e* over the course of approximately two years.

As discussed above, the total construction GHG emissions were amortized and included in the annual operational GHG emissions. Amortizing the construction GHG emissions (a one-time release that would occur only during construction of the project) and including them in the annual operational emissions (which would occur every year over the lifetime of the entire project) represents a conservative analysis for the annual operational GHG emissions. For the purpose of this analysis, project construction emissions were amortized over the two-year period that would include the construction phase, resulting in annual construction emissions of 546.73 MTCO$_2$*e*/yr.

As shown in Table 6, the existing on-site development results in annual GHG emissions of approximately 3,946.04 MTCO2e/yr. With implementation of the proposed project, operational GHG emissions associated with operations on the project site would be approximately 4,582.16 MTCO$_2$*e*/yr, for a net project increase of 636.12 MTCO$_2$*e*/yr relative to existing conditions. The project's total unmitigated annual GHG emissions in the first year of project operation, 2022, including amortized construction-related emissions, were estimated to be approximately 1,182.85 $MTCO_2e$/yr, which is above BAAQMD's 1,100 $MTCO_2e$/yr threshold of significance for GHG emissions. Thus, the proposed project could conflict with the emissions reductions targets of AB 32.

Table 6
Unmitigated Annual Project GHG Emissions

		Annual GHG Emissions
Construction-Related GHG Emissions		546.73 $MTCO_2e$/yr
Operational GHG Emissions	Existing	3,946.04 $MTCO_2e$/yr
	Proposed	4,582.16 $MTCO_2e$/yr
	Net Change	*+636.12 $MTCO_2e$/yr*
Total Annual GHG Emissions		**1,182.85 $MTCO_2e$/yr**
BAAQMD Threshold		**1,100 $MTCO_2e$/yr**
Source: CalEEMod, November 2019 (see Appendix A).		

Consistency with 2017 Scoping Plan

In the absence of adopted GHG emissions thresholds to assess compliance with SB 32, the BAAQMD has directed jurisdictions to qualitatively assess a project's compliance with the recommended mitigation measures within the *California's 2017 Climate Change Scoping Plan* (2017 Scoping Plan) as an alternative means of assessing a project's potential impacts related to GHG emissions.[31]

Appendix B to the CARB's 2017 Scoping Plan provides examples of potentially feasible mitigation measures that could be considered to assess a project's compliance with the State's 2030 GHG emissions reductions goals. Thus, general compliance with the Local Actions within the 2017 Scoping Plan could be considered to demonstrate the project's compliance with SB 32. The project's consistency with the applicable Local Actions within the 2017 Scoping Plan is assessed in Table 7 below.

Table 7
Project Consistency with the 2017 Scoping Plan

Suggested Measure	Consistency Discussion
Construction	
Enforce idling time restrictions for construction vehicles.	As required by CARB standards, idling times for on-road and off-road construction vehicles associated with the proposed project would be limited to five minutes or less. Thus, the proposed project would comply with the suggested measure.
Require construction vehicles to operate with the highest tier engines commercially available.	Mitigation Measure VIII-1 requires use of off-road heavy-duty construction equipment meeting CARB's Tier 4 emissions standards (or cleaner), to the extent feasible. Thus, with implementation of mitigation, the proposed project would comply with the suggested measure.
Divert and recycle construction and demolition waste, and use locally-sourced building materials with a high	The CALGreen Code requires the diversion of construction and demolition waste, and the proposed project would be required to comply with the

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31 Flores, Areana. Environmental Planner, Planning and Climate Protection. Personal communication [phone] with Jacob Byrne, Senior Associate/Air Quality Technician, Raney Planning and Management, Inc. September 17, 2019.

Table 7
Project Consistency with the 2017 Scoping Plan

Suggested Measure	Consistency Discussion
recycled material content to the greatest extent feasible.	requirements within the most up-to-date CALGreen Code. Thus, the project would be considered to comply with the suggested measure.
Minimize tree removal, and mitigate indirect GHG emissions increases that occur due to vegetation removal, loss of sequestration, and soil disturbance.	As part of the proposed project, removal of a total of 44 existing on-site trees would be required in order to accommodate the proposed renovations. The existing off-site trees located adjacent to the western site boundary would be retained, along with one existing on-site tree located along the eastern site frontage at Tara Hills Drive. In addition, the project would include planting of approximately 200 evergreen and deciduous trees throughout the on-site parking lot and drive aisles. Given that the project site has been subject to previous grading and is currently developed with a commercial shopping center, soil disturbance associated with the proposed project would be relatively limited. Consequently, the project would generally comply with the suggested measure.
Utilize existing grid power for electric energy rather than operating temporary gasoline/diesel powered generators.	The project applicant has not committed to the use of grid power for electric energy rather than operating temporary power generators; however, Mitigation Measure VIII-1 would require the project contractor to use grid power to the maximum extent feasible. Accordingly, with implementation of mitigation, the project would comply with the suggested measure.
Increase use of electric and renewable fuel powered construction equipment and require renewable diesel fuel where commercially available.	The project applicant has not committed to the use of alternatively fueled construction equipment. Furthermore, the commercial availability of renewable diesel in the project area is currently unknown. Mitigation Measure VIII-1 would require the use of alternatively fueled construction equipment and renewable diesel where commercially available. Thus, with implementation of mitigation, the proposed project would comply with the suggested measure.
Require diesel equipment fleets to be lower emitting than any current emission standard.	Mitigation Measure VIII-1 requires the use of off-road heavy-duty construction equipment meeting CARB's Tier 4 emissions standards (or cleaner), to the extent feasible. Thus, with implementation of mitigation, the proposed project would comply with the suggested measure.
Operations	
Comply with lead agency's standards for mitigating transportation impacts under SB 743.	The provisions of SB 743, as implemented by CEQA Section 15064.3, apply only prospectively; determination of impacts based on VMT is not required statewide until July 1, 2020. The City of Pinole has not yet adopted standards for analyzing or mitigating transportation impacts under SB 743. In addition, per the Office and Planning and Research (OPR) Technical Advisory On Evaluating Transportation Impacts in CEQA, if a redevelopment project "[…] leads to a net increase in provision of locally-serving retail, transportation impacts from the retail portion of the

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Table 7
Project Consistency with the 2017 Scoping Plan

Suggested Measure	Consistency Discussion
	development should be presumed to be less than significant."[32] Given that the project would be anchored by a major grocery store, the project would be considered to provide locally-serving retail and, thus, the aforementioned OPR guidance is applicable to the proposed project. Thus, the project is considered to comply with the suggested measure. Additional discussion of VMT is provided in Section XVII, Transportation, of this IS/MND.
Require on-site EV charging capabilities for parking spaces serving the project to meet jurisdiction-wide EV proliferation goals.	The proposed project would provide a total of 22 EV charging spaces on-site. Thus, the project would comply with the suggested measure.
Dedicate on-site parking for shared vehicles.	Given that the proposed project includes a CUP to allow for a reduction in on-site parking spaces, per Section 17.48.060 of the City's Municipal Code, the project applicant would be required to provide on-site shared parking. Thus, the project would comply with the suggested measure.
Provide adequate, safe, convenient, and secure on-site bicycle parking and storage in multi-family residential projects and in non-residential projects.	The proposed project would provide for on-site bicycle parking consistent with the ratios established by Section 17.48.120 of the City's Municipal Code. Accordingly, the project would comply with the suggested measure.
Provide on- and off-site safety improvements for bike, pedestrian, and transit connections, and/or implement relevant improvements identified in an applicable bicycle and/or pedestrian master plan.	As part of the project, new pedestrian walkways would be constructed throughout the site to provide continuous pedestrian connectivity between the proposed buildings, parking areas, and the existing sidewalk along Tara Hills Drive. Consequently, the project would comply with the suggested measure. Additional discussion of bicycle, pedestrian, and transit facilities is provided in Section XVII, Transportation, of this IS/MND.
Require on-site renewable energy generation.	The proposed project would not include on-site renewable energy generation. However, the roofs of the proposed buildings would be wired to be solar-ready. Consequently, the project would partially comply with the suggested measure.
Prohibit wood-burning fireplaces in new development, and require replacement of wood-burning fireplaces for renovations over a certain size development.	The proposed project would not include wood-burning fireplaces. Thus, the proposed project would comply with the suggested measure.
Require cool roofs and "cool parking" that promotes cool surface treatment for new parking facilities as well as existing surface lots undergoing resurfacing.	The 2019 Building Energy Efficiency Standards contain requirements for the thermal emittance, three-year aged reflectance, and Solar Reflectance Index (SRI) of roofing materials used in new construction and re-roofing projects. Such standards, with which the project would be required to comply, would help to reduce

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[32] Office of Planning and Research. *Technical Advisory on Evaluating Transportation Impacts in CEQA.* December 2018.

Table 7
Project Consistency with the 2017 Scoping Plan

Suggested Measure	Consistency Discussion
	heating and cooling costs associated with the proposed project. Therefore, the proposed project would generally comply with the suggested measure.
Require solar-ready roofs.	Consistent with the requirements of the 2019 Building Energy Efficiency Standards, as noted in Chapter 9 of the 2019 Nonresidential Compliance Manual, all of the proposed buildings would include solar-ready roofs. Consequently, the project would comply with the suggested measure.
Require organic collection in new developments.	Within the City of Pinole, Republic Services provides collection or organic waste for commercial uses. Consistent with AB 1826, all businesses within the City that generate four CY of waste or more each week are required to arrange for organic waste collection. Thus, the proposed project would include organic collection and the project would comply with the suggested measure.
Require low-water landscaping in new developments (see CALGreen Divisions 4.3 and 5.3 and the Model Water Efficient Landscape Ordinance [MWELO], which is referenced in CALGreen). Require water efficient landscape maintenance to conserve water and reduce landscape waste.	Project landscaping has been designed to integrate very low, low, and moderate water use plants to the maximum extent feasible. The project would be required to comply with the MWELO and, consequently, the proposed project would include low-water use landscaping in compliance with the suggested measure.
Achieve Zero Net Energy performance building standards prior to dates required by the Energy Code.	The project applicant has not committed to achieving Zero Net Energy. Thus, compliance with the suggested measure is uncertain at this time. It should be noted that the CBSC does not require new commercial development to achieve Zero Net Energy at this time.
Encourage new construction, including municipal building construction, to achieve third-party green building certifications, such as the GreenPoint Rated program, LEED rating system, or Living Building Challenge.	The project applicant has not committed to achieving third-party green building certification. Consequently, compliance with the suggested measure is uncertain at this time.
Require the design of bike lanes to connect to the regional bicycle network.	Appian Way does not include any dedicated bicycle facilities within the project vicinity. The nearest bicycle infrastructure in the vicinity of the project site is a Class II bike lane that begins 200 feet south of Appian Way and Mann Drive and continues north without providing any connection to the project site. Per the Circulation Element of the City's General Plan, Class I and Class II bicycle facilities are planned in the vicinity of the project area on Appian Way. The addition of two right-in, right-out driveways at the project site would offer bicyclists the opportunity to safely access the proposed development. The project would not include any new bicycle lanes on-site, as on-site vehicle circulation would be limited primarily to

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Table 7
Project Consistency with the 2017 Scoping Plan

Suggested Measure	Consistency Discussion
	parking areas. Given that the project would not conflict with existing or planned bicycle facilities, the project would comply with the suggested measure.
Expand urban forestry and green infrastructure in new land development.	The project would include landscaping throughout the site, which would result in an increase in the total number of trees on-site, compared to the existing site conditions. Therefore, the project would expand urban forestry and comply with the suggested measure.
Require preferential parking spaces for park and ride to incentivize carpooling, vanpooling, commuter bus, electric vehicles, and rail service use.	The proposed project would include 22 EV charging spaces, but would not include dedicated vanpool or carpool spaces. Thus, the project would partially comply with the suggested measure. It should be noted that carpool spaces are typically more effective for high employment-generating uses, such as office complexes, and are not necessarily appropriate for local-serving retail/commercial centers such as the proposed project.
Require the installation of energy conserving appliances such as on-demand tank-less water heaters and whole-house fans.	The proposed project would be required to comply with the 2019 Building Energy Efficiency Standards, a component of the CBSC, which includes standards related to installation of energy-efficient appliances. Thus, the project would generally comply with the suggested measure.
Require each residential and commercial building equip buildings [sic] with energy efficient AC units and heating systems with programmable thermostats/timers.	The proposed project would be required to comply with the 2019 Building Energy Efficiency Standards, a component of the CBSC, which includes standards related to energy-efficient heating and cooling systems. Thus, the project would generally comply with the suggested measure.
Require large-scale residential developments and commercial buildings to report energy use, and set specific targets for per-capita energy use.	The proposed project would not necessarily be considered to include large-scale commercial buildings. The project applicant has not committed to reporting energy use or setting specific energy use targets. Accordingly, compliance with the suggested measure is uncertain at this time.
Require each residential and commercial building to utilize low flow water fixtures such as low flow toilets and faucets (see CALGreen Divisions 4.3 and 5.3 as well as Appendices A4.3 and A5.3).	The proposed project would be required to comply with the non-residential water efficiency regulations within the CALGreen Code. Thus, the proposed project would comply with the suggested measure.
Require the use of energy-efficient lighting for all street, parking, and area lighting.	All proposed exterior lighting would be LED type, consistent with the 2019 Building Energy Efficiency Standards. Thus, the proposed project would comply with the suggested measure.
Require the landscaping design for parking lots to utilize tree cover and compost/mulch.	The proposed landscaping plans include tree planting throughout the proposed parking areas. As shown in Figure 5, the project would include a total parking lot area of approximately 60,142 sf. The estimated shade coverage after 15 years of receiving building permits would exceed 50 percent. The shade trees would achieve over 85 percent coverage of the parking area at

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Table 7
Project Consistency with the 2017 Scoping Plan

Suggested Measure	Consistency Discussion
	full maturity. In addition, the pedestrian pathways within the project site would include shade trees capable of providing over 60 percent canopy coverage at 15 years. Consistent with Section 15.54.026 of the City's Municipal Code, a minimum two-inch layer of mulch would be applied on all exposed soil surfaces of planting areas except in turf areas, creeping or rooting groundcovers, or direct seeding applications where mulch is contradicted. Thus, the proposed project would comply with the suggested measure.
Incorporate water retention in the design of parking lots and landscaping, including using compost/mulch.	The proposed project would include use of mulch within all non-lawn landscape areas to aid in water retention. In addition, all stormwater runoff from parking areas would be routed to bio-retention basins, which would allow stormwater to infiltrate underlying soils. Thus, the proposed project would comply with the suggested measure.
Require the development project to propose an off-site mitigation project which should generate carbon credits equivalent to the anticipated GHG emission reductions. This would be implemented via an approved protocol for carbon credits from California Air Pollution Control Officers Association (CAPCOA), the California Air Resources Board, or other similar entities determined acceptable by the local air district. The project may alternatively purchase carbon credits from the CAPCOA GHG Reduction Exchange Program, American Carbon Registry (ACR), Climate Action Reserve (CAR) or other similar carbon credit registry determined to be acceptable by the local air district.	The suggested mitigation measures included in the 2017 Scoping Plan are not considered to be requirements for local projects under CEQA, but instead represent options for projects to demonstrate compliance with the 2017 Scoping Plan. The inclusion of GHG off-set mitigation projects or the purchase of carbon credits is typically dependent on a project's exceedance of previously identified quantitative GHG thresholds. Considering that the project is expected to exceed BAAQMD's GHG emissions threshold, the City has chosen to require the project to purchase GHG reduction credits. As such, the proposed project would comply with the suggested measure.
Source: *California Air Resources Board. AB 32 Scoping Plan [Appendix B]. Accessible at: https://www.arb.ca.gov/cc/scopingplan/scopingplan.htm. Accessed September 2019.*	

As shown in Table 7, the proposed project would generally comply with many of the suggested measures. However, in the absence of mitigation, the project's compliance with the construction-related and operational measures in the 2017 Scoping Plan cannot be ensured. Because the 2017 Scoping Plan is the CARB's strategy for meeting the State's 2030 emissions goals established by SB 32, the project would be considered to potentially conflict with SB 32.

Consistency with Plan Bay Area 2040

The San Francisco Bay area's Plan Bay Area 2040 has been prepared jointly by the San Francisco Bay Area Metropolitan Transportation Commission (MTC) and the ABAG. Plan

Bay Area 2040 is a regional plan intended to provide a strategy for the reduction of GHG emissions and air pollutants within the San Francisco Bay Area. The Plan Bay Area 2040 is a long-range plan that serves as a Regional Transportation Plan and Sustainable Communities Strategy (SCS). As an SCS, the Plan Bay Area 2040 is required to comply with regional targets for reducing GHG emissions through the integration of transportation and land use planning. ABAG has not provided a specified means of identifying an individual development project's compliance with the Plan Bay Area 2040; however, for the purposes of this analysis, the conformance of the proposed project with the overall goal of the Plan Bay Area 2040 to reduce regional GHG emissions is generally considered.

Overall, the Plan Bay Area 2040 supports further growth in the region's housing stock and increases in employment opportunities in the area. In order to achieve the identified GHG reduction targets for the region while still accommodating such growth, the Plan Bay Area 2040 identifies Priority Development Areas (PDAs), where existing public transit and neighborhoods make compact development desirable. Compact development within PDAs allows for decreases in VMT as residents of existing areas can use alternative means of transportation to access new development. The project site is within a PDA identified in the Plan Bay Area 2040, and would result in an increased intensity of use within the project site, as compared to the existing conditions.

The level of growth anticipated in the PDAs was determined by considering various factors, including the existing land use and zoning designations implemented by local jurisdictions. Consequently, a project's compliance with the existing land use and zoning designations for a project site is an indication that a project would be within the growth assumptions used in the Plan Bay Area 2040. As discussed throughout this IS/MND, the project would be consistent with the intensity of development anticipated for the project site per the site's land use and zoning designations, and, as such, development of the project was generally included in the growth estimates for the region used as the basis of analysis in the Plan Bay Area 2040.

In addition, as discussed in Section XVII, Transportation, of this IS/MND, most of the vehicle trips associated with the proposed project would be made by customers and shoppers. To the extent that the project grows in daily and peak hour traffic, a commensurate reduction in traffic in other similar locations in the region is assumed to occur, either due to the project being located closer for new customers or because the project has newer and more attractive facilities. The redevelopment of the existing on-site shopping center with the convenience of a major grocery store, several restaurants and other retail facilities would discourage such extra miles travelled to access grocery stores and retail facilities far off, and help reduce the VMT in the area. Furthermore, the proposed project would include access to public transit and pedestrian facilities, and would include on-site bike racks to encourage increased mode sharing.

Because the project would support compact development within a PDA, which could contribute to reduced regional VMT, the proposed project would be considered consistent with the Plan Bay Area 2040, and would not conflict with the regional GHG reduction targets therein.

City of Pinole General Plan

The Sustainability Element of the City's General Plan includes goals, policies, and actions related to GHG emissions reductions and climate change. The project's consistency with the applicable goals and policies is assessed in Table 8 below. As shown in the table, the proposed project would be generally consistent with the City's Sustainability Element.

Table 8
Project Consistency with the Sustainability Element of the City of Pinole General Plan

Policy	Consistency Discussion
Operation	
Policy SE.1.4 Require all newly constructed, purchased, or leased municipal buildings or facilities to meet minimum standards for green building as appropriate.	The proposed project would be required to comply with the 2019 Building Energy Efficiency Standards, a component of the CBSC, which includes standards related to green building. Thus, the project would generally comply with Policy SE.1.4.
Policy SE.3.1 Reduce greenhouse gas emissions from City operations and community sources by a minimum of 15 percent below current or baseline levels by the year 2020.	Operations of the proposed project would not occur until the year 2022. Nonetheless, as discussed above, the project site is currently developed with commercial uses and the proposed project would not substantially increase on-site development. In addition, the project would involve improvements to the existing buildings to meet the 2019 Building Energy Efficiency Standards. The required compliance with such standards would include GHG emissions reduction measures sufficient to meet Policy SE.3.1.
Policy SE.3.3 Pinole will mitigate climate change by decreasing heat gain from pavement and other hard surfaces associated with infrastructure (i.e. heat island effect).	The project site is currently developed with commercial buildings, and the number of on-site trees would increase as a result of the proposed project. Per Section 17.44.050 of the City's Municipal Code, light-colored, high-albedo materials or vegetation would be installed for at least 50 percent of all sidewalks, patios, and driveways. In addition, the project would include planting approximately 200 evergreen and deciduous trees throughout the on-site parking lot and drive aisles. Overall, the project proposes 43,160 sf of landscape area and 28,550 sf of high-albedo paving. The total parking space area is 60,142 sf. Thus, the proposed project would provide shade and decrease heat gain from pavement to mitigate climate change, and thus, comply with Policy SE.3.3.
Policy SE.3.4 Reduce GHG emissions by reducing vehicle miles traveled and by increasing or encouraging the use of alternative fuels and transportation technologies.	The project would include a major grocery store, several restaurants and other retail facilities that would discourage extra miles travelled to access grocery stores and retail facilities far off, and therefore help reduce the VMT in the area. Furthermore, the proposed project would include access to public transit and pedestrian facilities, and would include on-site bike racks to encourage increased mode sharing. In addition, the proposed project would include EV charging spaces that would encourage the use of alternative fuels. As such, the project would comply with the Policy.

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Table 8
Project Consistency with the Sustainability Element of the City of Pinole General Plan

Policy	Consistency Discussion
Goal SE.4 Optimize energy efficiency and renewable energy.	The proposed project would not include on-site renewable energy generation. However, the 2019 CBSC includes standards for energy efficiency that would be required as part of the proposed project. Consequently, the project would generally comply with Goal SE.4.
Policy SE.4.3 Pinole will promote and require renewable energy generation and cogeneration where feasible and appropriate.	The proposed project would not include on-site renewable energy generation. However, consistent with the requirements of the 2019 Building Energy Efficiency Standards, all of the proposed buildings would include solar-ready roofs, which would allow an opportunity for future on-site renewable energy generation. Thus, the project would generally comply with the Policy.
Goal SE.5 Achieve a solid waste diversion of 75% of the waste stream by 2020.	Operations of the proposed project would not occur until the year 2022. The project applicant has not yet committed to a solid waste diversion plan. However, the project would be required to comply with Section 5.408 of the CALGreen Code, which mandates that over 65 percent of construction waste must be diverted and includes measures to limit waste generation. Therefore, the project would generally comply with Goal SE.5.
Goal SE.6 Integrate green building standards into all new and rehabilitated development.	The proposed project would be required to comply with the 2019 Building Energy Efficiency Standards, a component of the CBSC, which includes standards related to green building. As such, the project would comply with Goal SE.6.
Goal SE.8 Utilize transit options and reduce vehicle miles traveled and single-occupancy vehicle use.	The proposed project would help reduce VMT by providing a local-serving grocery store, restaurants, and retail stores that would thereby reduce the need for nearby residents to travel far for such amenities. Furthermore, the proposed project would include access to public transit and pedestrian facilities, and would include on-site bike racks to encourage increased mode sharing. As such, the project would comply with Goal SE.8.
Source: City of Pinole, 2010.	

Conclusion

Based on the above, the proposed project would not conflict with the Plan Bay Area 2040 or the Sustainability Element of the City's General Plan. While the project generally complies with most applicable measures included in Appendix B to the CARB's 2017 Scoping Plan, compliance with a few measures would require mitigation. In addition, the project is expected to exceed BAAQMD's adopted GHG threshold, and a conflict with AB 32 could occur. Thus, the project could generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, and could conflict with applicable plans, policies, and regulations adopted for the purpose of reducing the emissions of GHGs. Therefore, a ***potentially significant*** impact could occur.

Mitigation Measure(s)

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

VIII-1 *Prior to issuance of a grading permit, the project applicant shall show on the grading plans via notation that the contractor will comply with the following requirements, to the maximum extent feasible:*

- *Off-road heavy-duty diesel-powered equipment (e.g., rubber-tired dozers, excavators, graders, scrapers, pavers, paving equipment, and cranes) to be used for each phase of construction of the project (i.e., owned, leased, and subcontractor vehicles) shall meet CARB Tier 4 emissions standards or cleaner;*
- *Temporary power necessary for construction activities shall be supplied by the existing power grid, as opposed to portable generators;*
- *Alternatively-fueled construction equipment and renewable diesel shall be used for on-site construction, if such equipment is commercially available; and*
- *A construction waste management/diversion plan shall be followed.*

VII-2 *Prior to issuance of a grading permit, the project applicant shall provide proof of purchase of GHG reduction credits to mitigate for the project's threshold exceedance of 82.85 $MTCO_2e$. The project applicant may purchase carbon credits from a verified carbon credit registry that has been approved by the CAPCOA GHG Reduction Exchange Program, the American Carbon Registry (ACR), Climate Action Reserve (CAR), and/or the Verified Carbon Standard and meets the requirements of the CARB.*[33] *The purchase of off-site credits shall be negotiated with the City and BAAQMD at the time that credits are sought.*

[33] Off-set credits are purchased on a per metric tonne basis. Many carbon credit registries offer multiple options in the type of off-sets offered. For example, many carbon credit registries offer ongoing contracts (e.g., five-year contracts or longer) or one-time, single purchases. In addition, the credits go towards varying types of projects. Project applicants can elect to purchase off-sets from non-region/non-project-specific portfolios, where the carbon credit registry uses the monies towards any type of project in any location. Whereas, project applicants also have the option to purchase off-set credits towards specific projects or projects in specific areas. For example, a project applicant may prefer that their payment contribute towards a specific forestry or landfill gas capture project in California. Typically, increased specificity in projects correlates to higher costs per off-set. Most registries offer online access, where a quote can be requested and final purchase can be made. Worldwide, the range of carbon off-set prices in the voluntary off-set market can be anywhere from $0.10 per tonne to $44.80 per tonne.

IX. HAZARDS AND HAZARDOUS MATERIALS. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	✖	☐
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment?	☐	✖	☐	☐
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	✖	☐
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	✖	☐
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	✖
f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	✖	☐
g. Expose people or structures, either directly or indirectly, to the risk of loss, injury or death involving wildland fires?	☐	☐	✖	☐

Discussion

a. The proposed project would include a variety of uses, including, but not limited to, a kiosk, fuel station, and new building space to house the Safeway grocery store and other shops. Retail uses are not typically associated with the transport, use, or disposal of hazardous materials. With regard to the proposed fuel station, the project would be required to obtain a Variance and adhere to all requirements set forth by the City in the permit related to operational use. Fuel would be stored on-site in two new 30,000-gallon Xerxes underground storage tanks (USTs), which would dispense fuels through a total of 16 pumps. The USTs would be equipped with leak detection alarm systems and emergency shut off capabilities.

It should be noted that the underground storage of hazardous materials is subject to the provisions of the California Health and Safety Code and Title 23 of the California Code of Regulations. The Contra Costa Health Services Hazardous Materials Programs (CCHSHM) is the designated local agency assigned to implement the program to protect the public health from exposure to hazardous materials stored in USTs, including the protection of groundwater from contamination. In order to meet the requirements of the CCHSHM, the project would be subject to annual inspections and the issuance of operating permits, which are issued for UST system installation, removals, upgrades, and repairs. CCHSHM personnel would witness specified phases of the work being conducted on the UST system to ensure that the work is conforming to plans approved by the CCHSHM. Furthermore, transport of fuels to the project site would be required to adhere to the Hazardous Materials Regulations stipulated in the Code of Federal Regulations, Title 49, Parts 100-185, which regulate the transportation of hazardous material and hazardous waste.

Based on the above, the proposed project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. The impact would be ***less than significant***.

b. The following discussion provides an analysis of potential hazards and hazardous materials associated with upset or accident conditions related to the proposed construction activities and existing on-site conditions.

Construction Activities

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

Existing On-Site Hazardous Conditions

A Phase I Environmental Site Assessment (ESA) was prepared for the proposed project by Cornerstone Earth Group (Cornerstone) for the purpose of identifying potential recognized environmental conditions (RECs) associated with the project site. The Phase I ESA was prepared in November 2015 (2015 Phase I ESA) and was subsequently updated by Cornerstone in June of 2019 (2019 Phase I ESA Update) (see Appendix D).[34]

The Phase I ESAs included a reconnaissance of the site and neighboring properties and a review of regulatory agency database reports of public records for the site area, aerial photography, historic maps, and various other documentation. Based on information reviewed as part of the Phase I ESAs, the project site was vacant and undeveloped until approximately 1966, when structures were built at the addresses of 1201, 1211 to 1221, and 1401 to 1499 Tara Hills Drive. Initially, the businesses consisted of a Chevron service station, retail commercial businesses, restaurants, pharmacy, grocery store, photograph processing business, and a dry cleaner. Additions to the shopping center occurred by 1978 (1251, 1271, 1501, and 1565 to 1577 Tara Hills Drive) and by 1993 (1261 Tara Hills Drive). The Chevron station was reportedly demolished by 1997. A second fueling station (Rent-A-Rack) was formerly located at 1271 Tara Hills Drive from approximately 1972 until 1986. The dry cleaner business located at 1441 Tara Hills Drive operated from at least 1975 until closure in approximately 2017. The following sections provide a summary of the various on-site Recognized Environmental Conditions (RECs) identified by Cornerstone, as well as a few other notable site conditions identified in the Phase I ESA.

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34 Cornerstone Earth Group. *Phase I Environmental Site Assessment Update and Preliminary Soil Vapor Quality Evaluation, Appian 80 Shopping Center, 1201 to 1577 Tara Hills Drive, Pinole, California.* June 27, 2019.

Former USTs (1201 Tara Hills Drive)

The previous 2015 Phase I ESA and 2019 Phase I ESA Update identified former USTs at the former Chevron gas station located at 1201 Tara Hills Drive, within the northwestern corner of the project site. The former Chevron station previously included three 1,000-gallon gasoline USTs and one 1,000-gallon waste oil UST, as well as three hydraulic hoists. All four USTs and the three hydraulic hoists were removed in 1997. Confirmation sampling conducted during removal of the USTs at the Chevron station site did not indicate that a release had occurred, and the County required no further action. Thus, according to Cornerstone, the former Chevron gas station USTs would not pose a substantial risk to the proposed project.[35]

Former USTs (1271 Tara Hills Drive)

The former Rent-A-Rack facility located at 1271 Tara Hills Drive, within the southwestern portion of the project site, included two 1,000-gallon gasoline USTs and one 500-gallon waste oil UST. The USTs near the former Rent-A-Rack location were removed in 1986. Soil sampling conducted in 2013 indicated isolated areas of gasoline-related soil impacts in the vicinity of the former USTs. However, as noted in the Site Management Plan prepared for the former Rent-A-Rack facility, contaminants were not detected in a sample collected downgradient from the former USTs.[36] The Rent-A-Rack UST case was closed by the California Regional Water Quality Control Board (RWQCB) in 2014, having determined that the case met the criteria under the low-threat closure policy, though also indicating that residual petroleum-related impacts could be encountered during any future excavation.[37]

In December 2015, Cornerstone performed additional due diligence as part of a Phase I ESA for the property and advanced four borings to depths of approximately 10 feet at the former Rent-A-Rack. A petroleum odor and green discoloration were observed in all borings. Cornerstone attempted to collect soil vapor samples from the borings but was unsuccessful due to water intrusion from precipitation. Subsequently, on August 22, 2017, Cornerstone collected soil samples from four borings (boring locations EB-1 through EB-4) advanced to depths of up to approximately 10 feet. The samples were analyzed for petroleum hydrocarbons (TPHd, TPHo, and TPHg) and fuel-related VOCs (benzene, toluene, ethylbenzene, and xylenes). Based on the results of the laboratory analysis, all such chemicals were detected, but at concentrations that did not exceed the respective commercial or construction direct exposure Environmental Screening Levels (ESLs). Removal of the undocumented fill associated with the former USTs is being coordinated with Contra Costa County Department of Environmental Health. Residual petroleum impacts within the fill material and/or soil adjacent to the former UST pit likely are the source of the elevated VOC and TPHg soil vapor concentrations detected. Thus, contamination associated with the former USTs is not likely to pose a substantial risk to the proposed commercial development. Nonetheless, as noted in the Site Management Plan prepared for the former Rent-A-Rack facility, the potential exists for unexpected areas of apparent soil contamination to be encountered during excavation activities in the vicinity of the former USTs, and a significant impact could occur.

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35 Cornerstone Earth Group. *Phase I Environmental Site Assessment Update and Preliminary Soil Vapor Quality Evaluation, Appian 80 Shopping Center, 1201 to 1577 Tara Hills Drive, Pinole, California* [pg. 13]. June 27, 2019.

36 Cornerstone Earth Group. *Site Management Plan, Appian 80 Shopping Center, 1271 Tara Hills Drive, Pinole, California.* September 20, 2017.

37 Cornerstone Earth Group. *Pinole Square Shopping Center, Supplemental Information on Environmental Conditions* [pg. 1]. November 20, 2019.

Former Hydraulic Lifts and Oil Tanks (1251 and 1201 Tara Hills Drive)

While not specifically identified as an REC within the Phase I ESA, Cornerstone has identified potential hazards associated with the former Super Auto site located at 1251 Tara Hills Drive, within the northwestern portion of the site. According to a 1997 Hydraulic Lift Removal Report, five hydraulic lifts and associated oil tanks were removed from the former Super Auto site. TPHo impacted soil was reportedly encountered around two of the tanks, and soil was subsequently excavated. However, the report indicates that some TPHo soil was not excavated due to the risk of undermining the building. Based on the 1997 Hydraulic Lift Removal Report, TPHo impacted soil may occur underneath the facility. Thus, the potential exists for contaminated soils to be encountered during demolition and excavation activities within the vicinity of the former oil tanks. Although the extent appears limited to the former tanks, any impacted soils encountered during construction would require special handling and disposal. Thus, a significant impact could occur.

Former Dry Cleaner Facility (1441 Tara Hills Drive)

As noted above, a dry cleaner formerly operated at 1441 Tara Hills Drive, within the southeastern portion of the project site, from at least 1975 until approximately 2017 under the names of One Hour Martinizing, Holiday Cleaners, and Four Mile Express Cleaners. Hazardous materials records for the site indicate the prior use of tetrachloroethene (PCE) as a dry-cleaning solvent at the facility. As part of the 2019 Phase I ESA Update, Cornerstone collected soil vapor samples from beneath and adjacent to the 1441 Tara Hills Drive facility. Results from the soil vapor sample analysis indicated elevated concentrations of the chlorinated VOCs trichloroethene (TCE), cis-1,2-dichloroethene (cDCE), trans-1,2-dichloroethene (tDCE), and vinyl chloride adjacent to the facility. Such VOCs are degradation products of PCE, a dry-cleaning solvent. In addition, PCE was detected in soil vapor samples, but at a concentration below the Tier 1 ESL.

Cornerstone subsequently conducted an Additional Soil, Soil Vapor, and Groundwater Quality Evaluation, dated August 30, 2019, to further investigate contamination at the 1441 Tara Hills Drive dry cleaning facility (see Appendix E).[38] Four borings (SV-7, SV-8, SV-9, and SV-10) were advanced to depths of approximately five feet for soil vapor sample collection. Four borings (GW-1, GW-2, GW-3, and GW-4) were advanced to depths of approximately 22.5 feet for groundwater sample collection.

The additional subsurface evaluation performed by Cornerstone detected elevated concentrations of chlorinated-VOCs (cVOCs – PCE, TCE, cDCE, trans-1,2-dichloroethene [tDCE], and vinyl chloride) in soil vapor. According to Cornerstone, the cVOCs detected appear to have migrated from the adjacent Appian 80 Cleaners facility. Remediation of the Appian 80 Cleaners facility is being performed under a cleanup agreement with DTSC, as discussed below. In addition, soil vapor concentrations of benzene and gasoline-range petroleum hydrocarbons (TPHg) exceeding the Tier 1 soil vapor ESL were detected in the soil vapor samples. Potential fuel-related on-site sources were not identified in the area near the former dry cleaner; however, the property adjacent and to the northeast contains a closed leaking UST. Thus, the fuel-related impacts within the eastern portion of the project site may be associated with residual fuel-related impacts at the off-site property.

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38 Cornerstone Earth Group. *Additional Soil, Soil Vapor, and Groundwater Quality Evaluation, Pinole Square, 1211 to 1501 Tara Hills Drive, Pinole, California.* August 30, 2019.

Based on the above, the potential exists for construction activities within the vicinity of the former dry cleaner at 1441 Tara Hills Drive to result in upset of VOC contaminants. Thus, a significant impact could occur.

Appian 80 Cleaners Facility (1577 Tara Hills Drive)

Dry cleaning businesses have operated at 1577 Tara Hills Drive, within the northeastern portion of the project site, since approximately 1981. Cornerstone reviewed documents provided by the Contra Costa County Hazardous Materials Program that indicate PCE was previously used as the primary dry-cleaning solvent at the facility, followed by a synthetic aliphatic hydrocarbon (DF-2000) solvent. Releases associated with the prior use of PCE were discovered in 2008.

In June 2018, West Environmental submitted a Final Removal Action Work Plan to the Department of Toxic Substances Control (DTSC) to propose a remediation method to address the release of PCE in groundwater at the facility. The work plan included an assessment of various alternative remediation options and recommended to install a soil vapor extraction system, a bioremediation system to facilitate enhanced in-situ degradation of VOCs within ground water, and monitor ground water attenuation over time. The Final Removal Action Work Plan was approved by DTSC in July 2018, and remediation is currently being performed in accordance with the plan.

Once DTSC has completed a review of the cleanup efforts at 1577 Tara Hills Drive (Appian 80 Cleaners, active dry-cleaning facility), Cornerstone would meet with the caseworker to discuss the next steps to further assess the 1441 Tara Hills Drive dry cleaner site (i.e., former Four Mile dry-cleaning facility). Additional subsurface investigation work would be coordinated with DTSC due to their oversight of the Appian 80 Cleaners dry cleaner property and the fact that the VOC detections appear to be related. DTSC would be responsible for determining the appropriate future remedial measures necessary based on existing and future investigations at the former Four Mile dry cleaner site.

While the Appian 80 Cleaners facility is located within the project site, the building housing the facility would not be altered as part of the proposed redevelopment. Nonetheless, given the potential for VOC contamination within the area surrounding the facility, including the on-site parking lot, construction activities within the vicinity of the facility could potentially result in upset of hazardous materials, and a significant impact could occur.

Oil/Water Separators (1251 Tara Hills Drive and 1261 Tara Hills Drive)

Oil/water separators (OWSs) were previously observed at 1251 Tara Hills Drive (former Wheel Works) and 1261 Tara Hills Drive (former Bubbles Car Wash). OWSs treat wash water by allowing oils and greases to float to the surface for separation and substances heavier than water to sink. If OWSs are not maintained on a regular basis, oil and grease, as well as potentially other chemicals used on-site, can be discharged to the sewer during high flow period. Sludge can also build up in OWSs. Per the 2019 Phase I ESA Update, the soils underlying the former Wheel Works and Bubbles Car Wash structures would require evaluation by an environmental professional following demolition of the structures to ensure that stained and/or discolored soils are not present.

Planned Safeway Fueling Station

Tetra Tech, Inc. (Tetra Tech) has prepared a Pre-Fuel Center Baseline Phase II Environmental Site Assessment (Phase II ESA) for the proposed Safeway fuel station site,[39] the results of which are summarized in a supplemental memorandum prepared by Cornerstone.[40] As part of the Phase II ESA, Tetra Tech collected soil and groundwater samples from six borings advanced in the area of the proposed Safeway fuel station. The soil analytical data reported by Tetra Tech did not indicate soil impacts in the area sampled. The groundwater sample results reported one or more detections of gasoline-range petroleum hydrocarbons (TPHg), methyl tert-butyl ether (MTBE), cis-1,2-dichloroethene (cDCE), PCE, and trichloroethene (TCE) at elevated concentrations. The detections of cDCE, PCE, and TCE likely are from the Appian 80 Cleaners facility discussed above. TPHg and MTBE are fuel-related compounds that are likely from an up-gradient source. Two closed leaking UST facilities are located upgradient from where the samples were collected and are possible sources: the former BP, now Chevron station (2290 Appian Way) and the former Texaco station (1599 Tara Hills Drive). The TPHg and MTBE detections likely are not from the on-site former Rent-A-Rack station or the on-site former Chevron station, as both are located downgradient of the sample locations.

Tetra Tech documented groundwater at depths of approximately 24 to 40 feet in the area of the proposed fuel station. The proposed Safeway fuel station USTs would be installed to depths of approximately 15 feet. As such, groundwater is not expected to be encountered during installation of the USTs; thus, exacerbation of an existing environmental hazardous condition would not result from the project. Given that installation of the USTs and associated improvements would not result in upset of contaminated soil or groundwater, a less-than-significant impact would occur.

Asbestos-Containing Building Material

Asbestos is the name for a group of naturally occurring silicate minerals that are considered to be "fibrous" and, through processing, can be separated into smaller and smaller fibers. The fibers are durable, chemical resistant, and withstand heat and fire. They are also long, thin and flexible, so they can even be woven into cloth and other fabrics. Some building products such as vinyl floor tile, asbestos cement board, and roofing materials have been used in the construction of buildings. However, later discoveries found that, when inhaled, the material caused serious illness.

For buildings constructed prior to 1980, the Code of Federal Regulations (29 CFR 1926.1101) states that all thermal system insulation (boiler insulation, pipe lagging, and related materials) and surface materials must be designated as "presumed asbestos-containing material" unless proven otherwise through sampling in accordance with the standards of the Asbestos Hazard Emergency Response Act. Because all of the existing on-site structures were built prior to 1980, the potential exists that asbestos-containing materials were used in construction of the structures. Asbestos-containing materials can include but are not limited to: plaster, ceiling tiles, thermal systems insulation, floor tiles, vinyl sheet flooring, adhesives, and roofing materials. As such, the proposed demolition of the existing on-site structures could result in a potentially significant impact related to asbestos-containing materials.

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39 Tetra Tech, Inc. *Pre-Fuel Center Baseline Phase II Environmental Site Assessment Report, Proposed Safeway Store #3079, 1421 Tara Hills Drive, Pinole, California.* September 19, 2017.

40 Cornerstone Earth Group. *Pinole Square Shopping Center, Supplemental Information on Environmental Conditions*. November 20, 2019.

Lead-Based Paints

Lead Based Paint (LBP) is defined as any paint, varnish, stain, or other applied coating that has ≥1 mg/cm2 (5,000 µg/g or 5,000 ppm) of lead by federal guidelines. Lead is a highly toxic material that may cause a range of serious illnesses, and in some cases death. Structures built prior to 1978 and especially prior to the 1960s should be expected to contain LBP. The existing structures on the property were constructed before the phase-out of LBPs in the 1970s. Thus, the potential exists that the structures contain LBPs. As such, the proposed demolition of the existing on-site structures could result in a potentially significant impact related to LBP.

Off-Site UST Releases

As noted in the 2019 Phase I ESA Update, UST releases have been documented at the facilities located at 2298 Appian Way and 1599 Tara Hills Drive. Investigations conducted at both facilities indicate that impacts appear limited to the soil and groundwater beneath each facility and do not appear to have migrated to the project site. The facility at 1599 Tara Hills Drive was granted regulatory closure. As such, the facilities are not likely to impact the soil and/or groundwater quality beneath the project site.

Conclusion

Based on the above, equipment and chemicals associated with project construction would not directly result in the release of hazardous materials into the environment. However, ground disturbance associated with construction activities could involve upset of existing contaminants associated with the former USTs at 1271 Tara Hills Drive, the former hydraulic lifts and oil tanks at 1251 and 1201 Tara Hills Drive, the former dry cleaner facility at 1441 Tara Hills Drive, and the Appian 80 Cleaners facility at 1577 Tara Hills Drive. In addition, the proposed demolition activities could result in worker hazards related to asbestos-containing materials and LBP. Therefore, a ***potentially significant*** impact could occur related to creating a hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment.

Mitigation Measure(s)

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

IX-1 *Prior to initiation of any ground-disturbing activities, the project applicant shall prepare a Site Management Plan (SMP) that presents protocols for managing soil and groundwater encountered during construction, and potential vapor intrusion mitigation measures into future on-site buildings. In addition, the project applicant shall, prior to start of any remedial grading, consult with the Department of Toxic Substances and Control (DTSC) regarding the current status of investigation and/or remedial activities associated with the Appian 80 Cleaners facility (1577 Tara Hills Drive). The project applicant shall provide reasonable access in the vicinity of the former Four Mile dry cleaners for on-site investigation, monitoring or remedial actions (if any) required by DTSC that are associated with the Appian 80 Cleaners facility. Methods of investigation and remediation on-site that are associated with the facility may include, but are not necessarily limited to, the following:*

- *Installation of groundwater and/or soil vapor monitoring wells;*
- *Groundwater and soil vapor sampling/monitoring;*
- *In-situ remediation through enhanced bioremediation or chemical oxidation; and*
- *Soil vapor and/or groundwater extraction.*

All cleanup activities shall be conducted in consultation with DTSC and performed in accordance with local, State, and federal regulatory requirements to assure protection of human health and the environment.

IX-2 *Prior to issuance of a demolition permit for any on-site structures, the project applicant shall consult with certified Asbestos and/or Lead Risk Assessors to complete and submit an asbestos and lead survey to the City of Pinole Community Development Department for review and approval. If asbestos-containing materials (ACMs) or lead-containing materials are not discovered during the survey, further mitigation related to ACMs or lead containing materials will not be required. If ACMs and/or lead-containing materials are discovered by the survey, the project applicant shall prepare a work plan to demonstrate how the on-site ACMs and/or lead-containing materials shall be removed in accordance with current California Occupational Health and Safety (Cal-OSHA) Administration regulations and disposed of in accordance with all California Environmental Protection Agency regulations, prior to the demolition and/or removal of the on-site structures. The plan shall include the requirement that work shall be conducted by a Cal-OSHA registered asbestos and lead abatement contractor in accordance with Title 8 California Code of Regulations (CCR) 1529 and Title 8 CCR 1532.1 regarding asbestos and lead training, engineering controls, and certifications. The applicant shall submit the work plan to the City and the Contra Costa County Department of Conservation and Development for review and approval. Materials containing more than one percent asbestos that is friable are also subject to BAAQMD regulations. Removal of materials containing more than one percent friable asbestos shall be completed in accordance with BAAQMD Section 11-2-303.*

c. Pinole Middle School is located approximately 0.1-mile to the north of the site. As noted above, operations associated with the proposed project would result in less-than-significant impacts related to the transport, use, or disposal of hazardous materials. In addition, as discussed in Section III, Air Quality, of this IS/MND, the proposed project would not involve any substantial pollutant concentrations or increase in associated health risks. With implementation of Mitigation Measures IX-1 and IX-2, all potential impacts related to upset of existing hazardous materials at the project site would be reduced to less-than-significant levels. Therefore, the proposed project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school, and a ***less-than-significant*** impact would occur.

d. Per the 2019 Phase I ESA Update, the project site is included on multiple listings of hazardous materials sites compiled pursuant to Government Code Section 65962.5. However, implementation of Mitigation Measures IX-1 and IX-2 would ensure that all potential impacts related to upset of existing hazardous materials at the project site would be reduced to less-than-significant levels. Therefore, the proposed project would not create a substantial hazard to the public related to being located on a hazardous materials site, and a ***less-than-significant*** impact would occur.

e. The nearest airport to the project site is Buchanan Field Airport, located approximately 13 miles east of the site. As such, the project site is not located within two miles of any public airports, and does not fall within an airport land use plan area. Therefore, ***no impact*** would occur related to the project site being located within an airport land use plan or within two miles of a public airport or public use airport, thereby resulting in a safety hazard or excessive noise for people residing or working in the project area.

f. The proposed project would not include substantial alterations to the existing roadway network. Similar to existing conditions, access to the site would continue to be provided by three driveways along Tara Hills Drive. As a result, the project would have a ***less-than-significant*** impact with respect to impairing the implementation of or physically interfering with an adopted emergency response plan or emergency evacuation plan.

g. According to the CAL FIRE Fire and Resource Assessment Program, the project site is not located in or near a State Responsibility Area and is not classified as Very High Fire Hazard Severity Zone.[41] The nearest Very High Fire Hazard Severity Zone is located approximately 0.28-mile south of the site, across I-80. In addition, the project site is currently developed and surrounded by other existing urban development to the north, east, and west. Given the urbanized nature of the site and surrounding area, the potential for wildland fires to reach the project site would be limited. Therefore, the proposed project would not expose people or structures to the risk of loss, injury or death involving wildland fires, and a ***less-than-significant*** impact would occur.

41 California Department of Forestry and Fire Protection. *Contra Costa County Fire Hazard Severity Zones in SRA.* November 7, 2007.

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

Discussion

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

The State Water Resources Control Board (SWRCB) regulates stormwater discharges associated with construction activities where clearing, grading, or excavation results in a land disturbance of one or more acres. Performance Standard NDCC-13 of the City's National Pollutant Discharge Elimination System (NPDES) permit requires implementation of appropriate source control and site design measures and stormwater treatment measures for projects that create or replace one acre or more of impervious surface under the State's General Construction Permit prior to receipt of any construction permits. The State's General Construction Permit requires a SWPPP to be prepared for the site. A SWPPP describes Best Management Practices to control or minimize pollutants from entering stormwater and must address both grading/erosion impacts and non-point source pollution impacts of the development project, including post-construction impacts. Thus, the proposed construction activities would be subject to applicable SWRCB regulations. Furthermore, the project would be subject to Section 15.36.190 of the City's Municipal Code, which would require the project to include preparation of an Erosion and Sediment Control Plan.

Following completion of project construction, the site would be covered with landscaping and impervious surfaces and topsoil would not be exposed. Stormwater runoff from impervious surfaces within the project site would sheet flow to a series of new bio-retention basins to be constructed throughout the project site (see Figure 25). Each bio-retention basin would provide for treatment of incoming stormwater by allowing for runoff to infiltrate through layers of vegetated soil and gravel that would filter out pollutants. Treated runoff would be collected by perforated underdrains in each basin, which would route runoff to an existing 24-inch underground storm drain within the project site. Thus, all stormwater runoff on the project site would be properly treated prior to discharge to the City's storm drain system. As shown in Table 9 below, the proposed bio-retention basins within each Drainage Management Area (DMA) would exceed the minimum 20,728 sf of treatment area required for the proposed impervious surfaces.

Table 9
Proposed Bio-Retention Basin Sizing

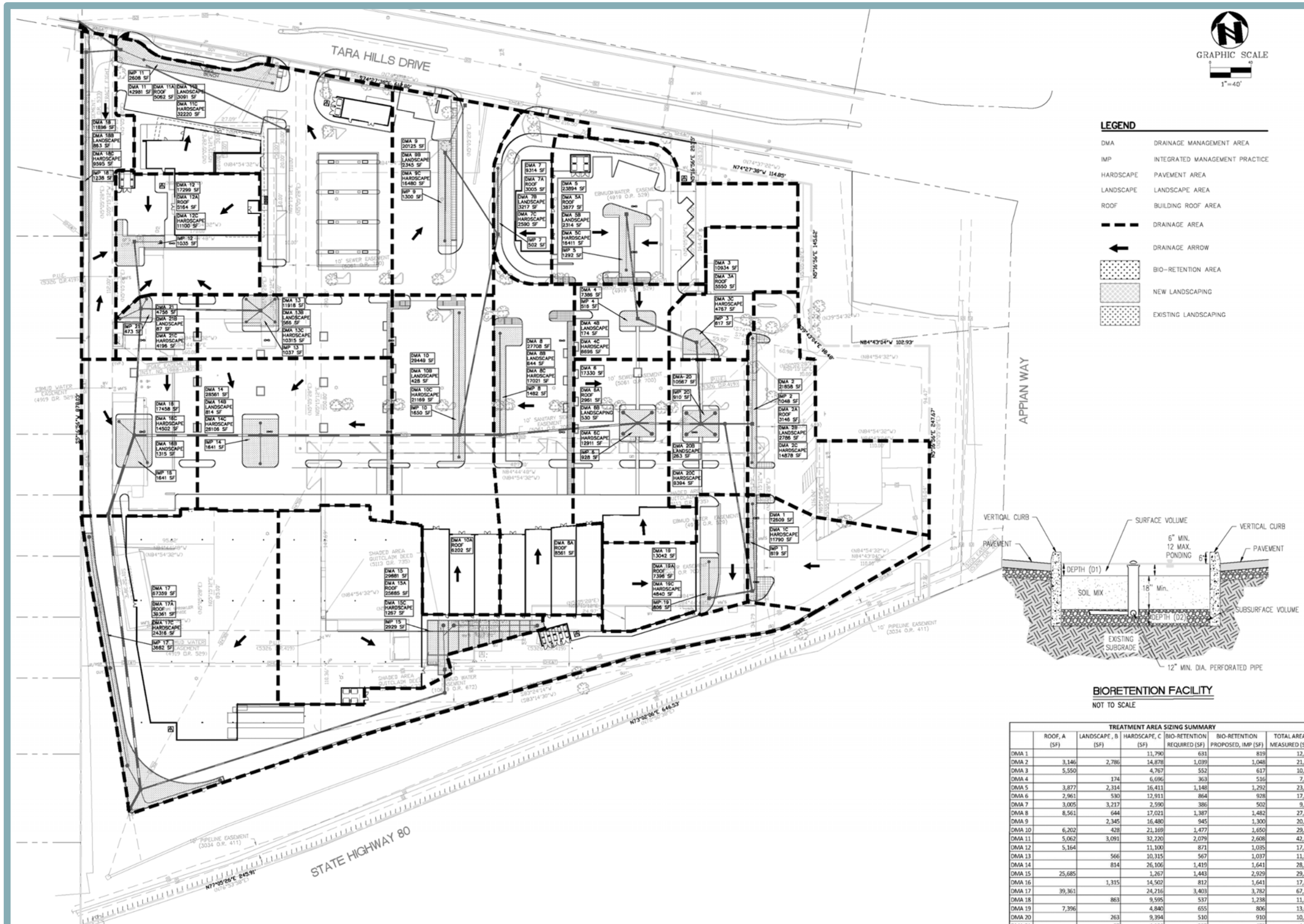
DMA	Roof (sf)	Landscape (sf)	Hardscape (sf)	Bio-Retention Required (sf)	Bio-Retention Provided (sf)	Total DMA Area (sf)
1		264	19,544	1,053	1,763	21,571
2		351	20,274	1,095	1,608	22,233
3		150	9,246	499	1,123	10,519
4		236	6,588	359	831	7,655
5	8,726	730	9,155	977	1,112	19,723
6		500	13,825	753	928	15,253
7	3,060	950	3,000	350	502	7,512
8		698	27,127	1,471	1,484	29,309
9		2,350	16,524	947	1,300	20,174
10		1,199	20,885	1,150	1,287	23,371
11	12,150	1,831	27,979	2,197	2,252	44,212
12	5,007	1,038	10,209	842	1,134	17,388
13		1,542	13,311	754	1,619	16,472
14		639	26,848	1,454	1,728	29,215
15	22,010			1,178	1,317	23,327
16		639	26,848	1,454	1,641	29,128
17	31,543	771	35,980	3,635	3,721	72,015
18		1,681	9,613	560	1,241	12,535
Total:	**31,543**	**3,091**	**72,441**	**20,728**	**26,591**	**421,612**

Because the proposed project would adhere to all applicable standards and regulations set forth by the NPDES permit and the City of Pinole, the proposed project is not anticipated to violate any water quality standards or waste discharge requirements or otherwise substantially degrade water quality. However, long-term maintenance of the proposed bio-retention basins is necessary in order to ensure that the basins continue to properly treat runoff throughout the lifespan of the project. In the absence of a guaranteed maintenance mechanism, a ***potentially significant*** impact could occur.

Mitigation Measure(s)

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

Figure 25
Stormwater Control Plan



TREATMENT AREA SIZING SUMMARY						
	ROOF, A (SF)	LANDSCAPE , B (SF)	HARDSCAPE, C (SF)	BIO-RETENTION REQUIRED (SF)	BIO-RETENTION PROPOSED, IMP (SF)	TOTAL AREA MEASURED (SF)
DMA 1			11,790	631	819	12,609
DMA 2	3,146	2,786	14,878	1,039	1,048	21,858
DMA 3	5,550		4,767	552	617	10,934
DMA 4		174	6,696	363	516	7,386
DMA 5	3,877	2,314	16,411	1,148	1,292	23,894
DMA 6	2,961	530	12,911	864	928	17,330
DMA 7	3,005	3,217	2,590	386	502	9,314
DMA 8	8,561	644	17,021	1,387	1,482	27,708
DMA 9		2,345	16,480	945	1,300	20,125
DMA 10	6,202	428	21,169	1,477	1,650	29,449
DMA 11	5,062	3,091	32,220	2,079	2,608	42,981
DMA 12	5,164		11,100	871	1,035	17,299
DMA 13		566	10,315	567	1,037	11,918
DMA 14		814	26,106	1,419	1,641	28,561
DMA 15	25,685		1,267	1,443	2,929	29,881
DMA 16		1,315	14,502	812	1,641	17,458
DMA 17	39,361		24,216	3,403	3,782	67,359
DMA 18		863	9,595	537	1,238	11,696
DMA 19	7,396		4,840	655	806	13,042
DMA 20		263	9,394	510	910	10,567
DMA 21		87	4,196	227	473	4,756

X-1 *Prior to the issuance of a grading permit, the project applicant shall retain a registered civil engineer to prepare an Erosion and Sediment Control Plan for submittal to the City Engineer for review and approval. The Erosion and Sediment Control Plan shall include provisions to effectively minimize soil erosion and sedimentation from the redeveloped project site and provide for the control of runoff from the site in accordance with Section 15.36.190 of the City Municipal Code. Provisions may include, but shall not be limited to, the following:*

- *Hydroseeding;*
- *Placement of erosion control measures within drainage areas and ahead of drop inlets;*
- *Temporary lining (during construction activities) of drop inlets with "filter fabric;*
- *Placement of straw wattles along slope contours;*
- *Use of a designated equipment and vehicle "wash-out" location;*
- *Use of siltation fences;*
- *Use of on-site rock/gravel road at construction access points, as necessary; and*
- *Use of sediment basins and dust palliatives.*

X-2 *Prior to approval of final improvement plans, the applicant shall prepare and submit, for the City's review, an acceptable Stormwater Control Operation and Maintenance Plan. In addition, prior to the sale, transfer, or permanent occupancy of the site the applicant shall be responsible for paying for the long-term maintenance of treatment facilities, and executing a Stormwater Management Facilities Operation and Maintenance Agreement and Right of Entry in the form provided by the City of Pinole. The applicant shall accept the responsibility for maintenance of stormwater management facilities until such responsibility is transferred to another entity.*

The applicant shall submit, with the application of building permits, a draft Stormwater Facilities and Maintenance Plan, including detailed maintenance requirements and a maintenance schedule for the review and approval by the Director of Public Works/City Engineer. Typical routine maintenance consists of the following:

- *Limit the use of fertilizers and/or pesticides. Mosquito larvicides shall be applied only when absolutely necessary.*
- *Replace and amend plants and soils as necessary to ensure the planters are effective and attractive. Plants must remain healthy and trimmed if overgrown. Soils must be maintained to efficiently filter the storm water.*
- *Visually inspect for ponding water to ensure that filtration is occurring.*
- *After all major storm events remove trash, inspect drain pipes and bubble-up risers for obstructions and remove if necessary.*
- *Continue general landscape maintenance, including pruning and cleanup throughout the year.*

- *Irrigate throughout the dry season. Irrigation shall be provided with sufficient quantity and frequency to allow plants to thrive.*
- *Excavate, clean and or replace filter media (sand, gravel, topsoil) to ensure adequate infiltration rate (annually or as needed).*

b,e. Water supplies for the project site are supplied by the City of Pinole, and would continue to be provided by the City upon completion of the proposed redevelopment. Per the City's General Plan EIR (Chapter 4.9-11), the City receives water supplies from the East Bay Municipal Utility District (EBMUD).[42] EBMUD is a public agency that provides drinking water to 1.3 million people and wastewater systems for 640,000 people in portions of Contra Costa County. EBMUD's water supplies are obtained primarily from the Mokelumne River watershed (nine percent) and from local area watersheds (10 percent). While the EBMUD has identified increased water storage in groundwater aquifers as a potential future alternative water supply to meet demands in dry periods, the EBMUD does not currently obtain any water supplies from groundwater sources. Furthermore, given that the proposed project is consistent with the intensity of development anticipated for the site per the project site's current General Plan/Specific Plan land use and zoning designations, the project would not result in increased use of groundwater supplies beyond what has been anticipated for the site by the City and accounted for in regional planning efforts.

Consequently, the proposed project would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project would impede sustainable groundwater management, and would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. Therefore, the project would result in a ***less-than-significant*** impact.

ci-iii. All municipalities within Contra Costa County are required to develop more restrictive surface water control standards for new development projects as part of the renewal of the Countywide NPDES permit. Known as the "C.3 Standards", new development and redevelopment projects that create or replace 10,000 or more square feet of impervious surface area must contain and treat stormwater runoff from the site. According to the Stormwater Control Plan (SWCP) prepared for the project, implementation of the proposed project would involve the creation of new impervious surfaces, including roofs and hardscape areas. A substantial portion of the impervious surfaces created would replace existing impervious surfaces on the project site. Because the proposed project would replace more than 10,000 square feet of impervious surface area, the proposed project would be considered a C.3 regulated project and is required to include appropriate site design measures, source controls, and stormwater treatment measures.

The SWCP prepared for the proposed project incorporates the most recent Stormwater C.3 Guidebook and Contra Costa Clean Water Program requirements,[43] as well as all applicable City stormwater requirements. As noted previously, the proposed project would include an on-site stormwater drainage system to capture and treat runoff from each DMA within the site prior to discharging treated runoff to an existing 24-inch underground storm drain within the project site, which would ultimately convey runoff into the City's off-site storm drainage system. As shown in Table 9 above, the proposed bio-retention basins meet the minimum sizing requirement with respect to each DMA.

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42 City of Pinole. *General Plan Update Draft Environmental Impact Report [pg. 4.9-11].* July 2010.
43 Contra Costa County Clean Water Program. *Stormwater C.3 Guidebook.* May 17, 2017.

Given that the site is currently developed with a commercial shopping center and associated parking areas, the proposed project would not substantially increase the amount of on-site impervious surfaces relative to what currently exists. Thus, the surrounding infrastructure has been designed and built to accommodate stormwater runoff associated with development of the area, including the project site.

Furthermore, the project would be required to pay drainage fees to the City prior to issuance of building permits. Drainage fees would be used to maintain and expand the City's existing stormwater drainage system. Although the proposed BMPs could adequately treat stormwater, without a long-term maintenance plan, continued operation of the proposed BMPs cannot be assured. Should the proposed water quality treatment facilities not be maintained properly, a ***potentially significant*** impact could occur with respect to creating or contributing runoff water which would exceed the capacity of existing or planned stormwater drainage systems, providing substantial additional sources of polluted runoff, or altering existing drainage in a manner which would result in flooding, erosion, or siltation on- or off-site.

Mitigation Measure(s)

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

X-3 *Implement Mitigation Measure X-2.*

civ. According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map for the project site, the project site is located within an Area of Minimal Flood Hazard (Zone X).[44] The site is not classified as a Special Flood Hazard Area or otherwise located within a 100-year or 500-year floodplain. Therefore, development of the proposed project would not impede or redirect flood flows and ***no impact*** would result.

d. As discussed under question 'civ' above, the project site is not located within a flood hazard zone. Tsunamis are defined as sea waves created by undersea fault movement, whereas a seiche is a long-wavelength, large-scale wave action set up in a closed body of water such as a lake or reservoir. The General Plan EIR states that the likelihood for a tsunami to occur in the City's Planning Area is relatively low.[45] Seiches do not pose a risk to the proposed project, as the project site is not located adjacent to any large closed body of water. Based on the above, the risk of pollutant release due to inundation of the project by flooding, tsunami, or seiche would be ***less-than-significant***.

[44] Federal Emergency Management Agency. *Flood Insurance Rate Map 06013C0231G.* Effective March 21, 2017.
[45] City of Pinole. *General Plan Update Draft Environmental Impact Report, SCH #2009022057.* July 2010.

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

Discussion

a. The project site is currently developed with a commercial shopping center. The proposed redevelopment project would represent a continuation of the type and intensity of uses currently occurring on-site. Therefore, the proposed project would have a ***less-than-significant*** impact related to the physical division of an established community.

b. Per the Three Corridors Specific Plan, the project site is located within the Service Sub-Area of the Appian Way Specific Plan area. The Specific Plan designates the site CMU-HDRO. Per the Specific Plan, the CMU designation is designed to provide for the integration of retail and service commercial uses with office and/or residential uses; a minimum of 51 percent of all on-site uses must be commercial. Per a January 28, 2019 Joint Session, the City Council and Planning Commission determined that housing is not required on the project site under the site's current land use and zoning designations, as the City meets the latest RHNA housing allotments without the 125 residential units previously identified for the project site per the City's Housing Element.

According to Table 6.14, Permitted Use Table for Appian Way, of the Three Corridors Specific Plan, drive-in/drive-through sales/services or service stations are not permitted uses within the CMU land use designation. Thus, the proposed project would require an amendment to the Specific Plan in order to allow for the proposed drive-through restaurant and Safeway gas station on the project site. The Specific Plan text amendment would allow for drive-in/drive-through sales/services and service stations land use classifications with a Conditional Use Permit in the Appian Way Service Sub-Area CMU zone, provided that such land uses are a part of a shopping center project (not stand alone) and owned by an on-site major retailer within the shopping center project.

While the proposed project would require an amendment to the Specific Plan, the project would be generally consistent with the intensity of uses anticipated for the site per the site's current land use designation. In addition, with approval of various Conditional Use Permits and a Variance, the project would be consistent with the site's current CMU-HDRO zoning designation. Furthermore, as discussed throughout this IS/MND, the proposed project would not conflict with any City policies or regulations adopted for the purpose of avoiding or mitigating an environmental effect, including, but not limited to, the City's noise standards and applicable SWRCB regulations related to stormwater. Implementation of Mitigation Measure IV-3 would ensure that the project would comply with the applicable provisions of the City's Tree Protection Ordinance. Furthermore, as discussed in Section VIII, Greenhouse Gas Emissions, of this IS/MND, implementation of Mitigation Measures VII-1 and VII-2 would ensure that the proposed project would be consistent with the 2017 Scoping Plan, Plan Bay Area 2040, and applicable City General Plan goals and policies related to GHG emissions.

Based on the above, the project would not cause a significant environmental impact due to conflicts with a land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. Therefore, a ***less-than-significant*** impact would occur.

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

Discussion

a,b. The City's General Plan does not identify any locally important mineral resources within the project area. In addition, the project site is currently developed with a commercial shopping center, and is designated for commercial development per the General Plan and Specific Plan. Therefore, the proposed redevelopment project would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State, or a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan. Thus, ***no impact*** would occur.

XIII. NOISE. *Would the project result in:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	✖	☐	☐
b. Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	✖	☐
c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	✖

Discussion

The following is based primarily on an Environmental Noise & Vibration Assessment (Noise Assessment) prepared for the proposed project by Bollard Acoustical Consultants, Inc. (see Appendix F).[46]

a. The following sections present information regarding sensitive noise receptors in proximity to the project site, the existing noise environment, and the potential for the proposed project to result in noise-related impacts during project construction and operation. The following terms are referenced in the sections below:

- Decibel (dB): A unit of sound energy intensity. An A-weighted decibel (dBA) is a decibel corrected for the variation in frequency response to the typical human ear at commonly encountered noise levels. All references to decibels (dB) in this section are A-weighted unless noted otherwise.
- Day-Night Average Level (L_{dn}): The average sound level over a 24-hour period, with a penalty of 10 dB applied to noise occurring during nighttime hours (10:00 PM to 7:00 AM).
- Equivalent Sound Level (L_{eq}): The average sound level over a given time-period.
- Sound Exposure Level (SEL): SEL is similar to L_{eq}, as the total sound energy is integrated over a measurement period. However, instead of averaging over the measurement period, a reference duration of one second is used.
- Maximum Sound Level (L_{max}): The maximum sound level over a given time-period.
- Median Sound Level (L_{50}): The sound level exceeded 50 percent of the time over a given time-period.

Sensitive Noise Receptors

Noise-sensitive land uses are generally defined as locations where people reside or where the presence of unwanted sound could adversely affect the primary intended use of the land. Places where people live, sleep, recreate, worship, and study are generally considered to be sensitive to noise because intrusive noise can be disruptive to such activities.

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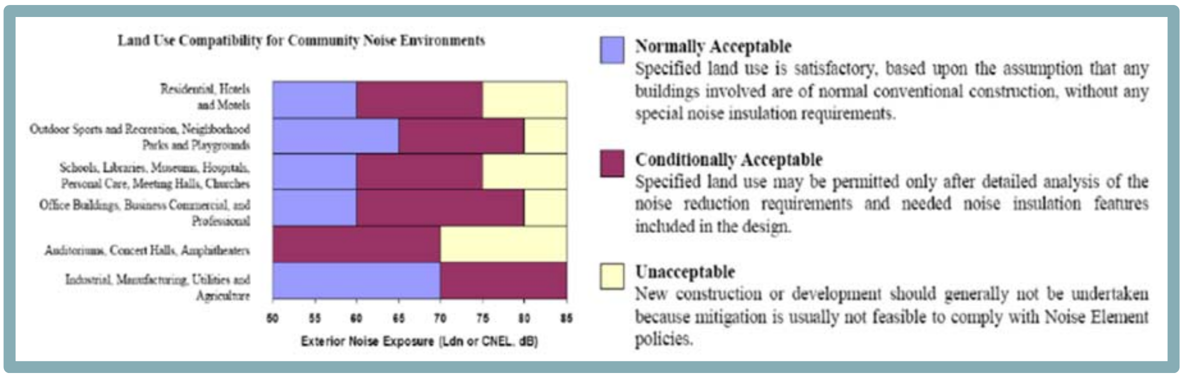
46 Bollard Acoustical Consultants, Inc. *Environmental Noise & Vibration Assessment, Pinole Square Redevelopment Project – Phases 1-3, Pinole, California.* January 13, 2020.

The noise-sensitive land uses which would potentially be affected by the proposed project consist of residential uses. Specifically, single-family residential land uses are located to the west of the project site. Existing commercial uses are located to the east of the project site, which are typically not considered to be noise-sensitive.

Standards of Significance

General Plan Policy HS 8.1 states that new development projects should meet acceptable exterior noise level standards. The normally acceptable noise standards for new land uses are established in Land Use Compatibility for Community Exterior Noise Environments (as shown below). As shown below, 60 dB is considered the maximum normally acceptable noise level at a residential land use.



General Plan Policy HS 9.1 states that noise created by commercial or industrial sources associated with new projects or developments should be controlled so as not to exceed the noise level standards set forth in Table 10 below.

Table 10
City of Pinole Maximum Allowable Noise Exposure from Stationary Sources[1]

	Daytime[5] (7 AM to 10 PM)	Nighttime[2,5] (10 PM to 7 AM)
Hourly L_{eq}, dB[3]	55	45
Maximum Level, dB[3]	70	65
Maximum Level, dB – Impulsive Noise[4]	65	60

1 As determined at the property line of the receiving land use. When determining effectiveness of noise mitigation measures, the standards may be applied on the receptor side of noise barriers or other property line noise mitigation measures.
2 Applies only where the receiving land use operates or is occupied during nighttime hours.
3 Sound level measurements shall be made with "slow" meter response.
4 Sound level measurement shall be made with "fast" meter response.
5 Allowable levels shall be raised to the ambient noise levels where the ambient levels exceed the allowable levels. Allowable levels shall be reduced 5 dB if the ambient hourly L_{eq} is at least 10 dB lower than the allowable level.

Source: City of Pinole General Plan Update Draft EIR, July 2010.

As mentioned above, the Pinole Municipal Code does not include noise standards applicable to transportation or non- transportation noise sources. However, Section 15.02.070 of the City's Municipal Code includes the following hourly restrictions and nuisance provisions related to construction activities:

- Work is allowed from 7:00 AM to 5:00 PM on non-federal holidays, but no inspections would be performed.
- Saturday work is allowed in commercial zones only, from 9:00 AM to 6:00 PM, as long as it is interior work and does not generate significant noise.
- The City Council designates the City Manager (or his/her designee) to further modify on a case-by-case basis the hours of construction in commercial zones. Additionally, the City Manager (or his/her designee) has the ability to modify the construction hours on a case-by-case basis based on inclement weather conditions or certain construction procedures (such as setting up from a concrete pour) that may require working beyond 5:00 PM on weekdays or 6:00 PM on Saturday.
- Administrative citations and penalties penalize responsible parties who fail or refuse to comply with any City ordinance or fail to promptly abate a public nuisance.

As mentioned above, the City of Pinole has not established a threshold for significant increases in traffic noise. However, the Federal Interagency Committee on Noise (FICON) has developed guidance to be used for the assessment of project-generated increases in noise levels that consider the ambient noise level. Such guidance is considered a conservative approach to analyzing substantial increases in noise levels. Based on the FICON research, as shown in Table 11, a 5 dB increase in noise levels due to a project is required for a finding of significant noise impact where ambient noise levels without the project are less than 60 dB. Where pre-project ambient conditions are between 60 and 65 dB, a 3 dB increase is applied as the standard of significance. Finally, in areas already exposed to higher noise levels, specifically pre-project noise levels in excess of 65 dB, a 1.5 dB increase is considered by FICON as the threshold of significance.

Table 11
FICON Noise Level Increase Standards

Ambient Noise Level Without Project (L_{dn} or CNEL)	Change in Ambient Noise Level Due to Project
<60 dB	+5.0 dB or more
60 to 65 dB	+3.0 dB or more
<65 dB	+1.5 dB or more

Source: Bollard Acoustical Consultants, Inc., 2020.

Existing Noise Environment

The existing ambient noise environment within the project vicinity is defined primarily by noise from traffic on I-80, Tara Hills Drive, and Appian Way. To generally quantify the existing ambient noise environment at the nearest existing sensitive uses to the project site, short-term (15-minute) ambient noise surveys were conducted at four locations on July 8, 2019 (see Figure 26). A summary of the measurement results is provided in Table 12. As shown in the table, ambient noise levels ranged from 54 to 66 dB L_{eq}, with maximum noise levels ranging from 68 to 82 dB L_{max}.

Figure 26
Noise Measurement Location

Source: Bollard Acoustical Consultants, Inc., 2020.

Table 12
Short-Term Ambient Noise Monitoring Results

Site	Description	Time	Measured Noise Levels, dB	
			L_{eq}	L_{max}
ST-1	Centrally located along the western project boundary	2:58 PM	54	68
ST-2	Located along the northwest project boundary	3:15 PM	60	81
ST-3	Located along the southwest project boundary	3:32 PM	62	82
ST-4	North of project site, adjacent to Tara Hills Drive	3:57 PM	66	75

Source: Bollard Acoustical Consultants, Inc., 2020.

Based on the measured ambient noise levels, the adjusted General Plan daytime and nighttime noise level limits that would be applicable to the proposed project are summarized in Table 13 below.

Table 13
Adjusted General Plan Noise Level Standards

Adjacent Residential Locations	Unadjusted Standards				Adjusted Based on Measured Ambient Noise Levels?				Applicable Standards			
	Daytime		Nighttime		Daytime		Nighttime		Daytime		Nighttime	
	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}
West	55	70	45	65	N	N	Y	N	55	70	54	65
Northwest	55	70	45	65	Y	Y	Y	N	60	81	54	65
Southwest	55	70	45	65	Y	Y	Y	N	62	82	54	65

Source: Bollard Acoustical Consultants, Inc., 2020.

Project Construction Noise

During construction of the proposed project, heavy-duty equipment would be used for demolition, grading, excavation, paving, and building construction, which would result in temporary noise level increases while in operation. Noise levels would vary depending on the type of equipment used, how the equipment is operated, and how well the equipment is maintained. In addition, noise exposure at any single point outside the project site would vary depending on the proximity of construction activities to that point. The property lines of the nearest existing residential uses are located approximately 30 feet away from where construction activities would occur on the project site.

Table 14 includes the range of maximum noise levels for equipment commonly used in general construction projects at full-power operation at a distance of 50 feet. Not all of the construction activities included in the table would be required of the proposed project. Table 14 data also include predicted maximum equipment noise levels at the property lines of the nearest sensitive uses located approximately 30 feet away, which assume a standard spherical spreading loss of 6 dB per doubling of distance.

Based on the equipment noise levels in Table 14, worst-case on-site project construction equipment noise levels at the property lines of the nearest existing residential uses located 30 feet away are expected to range from approximately 80 to 94 dB. Thus, the project construction equipment could result in a substantial short-term increase in noise over ambient maximum noise levels at the nearest existing sensitive uses. Such noise levels could exceed the applicable City of Pinole General Plan noise level limits. As a result, a potentially significant impact could occur related to construction noise.

Table 14
Construction Equipment Noise

Type of Equipment	Maximum Level, dB at 50 feet	Maximum Level, dB at 30 feet
Air compressor	80	84
Backhoe	80	84
Ballast equalizer	82	86
Ballast tamper	83	87
Compactor	82	86
Concrete mixer	85	89
Concrete pump	82	86
Concrete vibrator	76	80
Crane, mobile	83	87
Dozer	85	89
Generator	82	86
Grader	85	89
Impact wrench	85	89
Jack hammer	88	92
Loader	80	84
Paver	85	89
Pneumatic tool	85	89
Pump	77	81
Rail saw	90	94
Saw	76	80
Scarifier	83	87
Scraper	85	89
Shovel	82	86
Spike driver	77	81
Tie cutter	84	88
Tie handler	80	84
Tie inserter	85	89
Truck	84	88

Source: Bollard Acoustical Consultants, Inc., 2020.

Project Operational Noise

The following sections describe potential traffic and operational noise impacts at existing sensitive uses in the project vicinity.

It should be noted that subsequent to preparation of the January 2020 Noise Assessment, the existing and proposed building square footages were refined, which resulted in slight decreases in the total existing and proposed building areas. In response to the building area refinements, the project traffic consultant (TJKM Transportation Consultants) identified that, although the changes in square footage would result in a slight increase in the number of net new vehicle trips, the increase would not change the conclusions presented in the Transportation Impact Study prepared for the project. Accordingly, revisions to the Transportation Impact Study were not necessary as a result of the refinement in square footages. Similarly, noise levels associated with the slight increase in net new vehicle trips would not be appreciable and would not change the conclusions presented in the Noise Assessment prepared by BAC.[47]

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[47] Bollard Acoustical Consultants, Inc. *Changes in noise levels associated with revised building square footages for the proposed Pinole Square Redevelopment project in Pinole, California*. February 18, 2020.

Traffic Noise – Existing Plus Project

Potential traffic noise increases occurring as a result of the project were evaluated using the traffic volumes for the Existing Plus Project conditions obtained from TJKM. The resulting noise levels were calculated using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108. Table 15 below summarizes the calculated traffic noise levels at a standard distance of 50 feet from the centerline of the area roadways for the Existing Plus Project conditions.

As shown in the table, traffic generated by the project under Existing Plus Project conditions would not result in a significance increase of traffic noise levels on the local roadway network in excess of the applicable FICON significance criteria identified in Table 11. As a result, off-site traffic noise impacts related to increases in traffic resulting from the implementation of the proposed project would be considered less than significant under Existing Plus Project conditions.

Table 15
Traffic Noise – Existing Plus Project

#	Intersections	Direction	Traffic Noise at 50 feet (dB, L_{dn}) No Project	With Project	Change	Substantial Increase?
1	Project Drive/Tara Hills Drive	North	56.0	56.0	0.0	No
2		South	57.8	59.2	1.4	No
3		East	65.2	65.6	0.4	No
4		West	64.2	64.3	0.1	No
5	Appian Way/Tara Hills Drive	North	64.5	64.6	0.1	No
6		South	69.3	69.4	0.1	No
7		East	56.5	56.7	0.2	No
8		West	65.3	65.6	0.3	No
9	Appian Way/I-80 WB Ramps	North	69.4	69.4	0.0	No
10		South	69.1	69.2	0.1	No
11		East	67.4	67.5	0.1	No
12		West	66.7	66.7	0.0	No
13	Appian Way/I-80 EB Ramps	North	69.2	69.2	0.0	No
14		South	69.8	69.8	0.0	No
15		East	67.2	67.2	0.0	No
16		West	66.7	66.7	0.0	No

Source: Bollard Acoustical Consultants, Inc., 2020.

Traffic Noise – Cumulative Plus Project

Potential traffic noise increases occurring as a result of the proposed project were evaluated using the traffic volumes for the Cumulative Plus Project conditions obtained from TJKM. Table 16 below summarizes the calculated traffic noise levels at a standard distance of 50 feet from the centerline of the project area roadways for the Cumulative Plus Project conditions.

As shown in the table, traffic generated by the proposed project under Cumulative Plus Project conditions would not result in an increase of traffic noise levels on the local roadway network in excess of the applicable FICON significance criteria identified in Table 11. As a result, off-site traffic noise impacts related to increases in traffic resulting from the implementation of the proposed project would be considered less than significant under Cumulative Plus Project conditions.

Table 16
Traffic Noise – Cumulative Plus Project

#	Intersections	Direction	Traffic Noise at 50 feet (dB, L_{dn}) No Project	With Project	Change	Substantial Increase?
1	Project Drive/Tara Hills Drive	North	56.3	56.4	0.1	No
2		South	58.2	59.5	1.3	No
3		East	65.6	65.9	0.3	No
4		West	64.5	64.6	0.1	No
5	Appian Way/Tara Hills Drive	North	64.8	64.9	0.1	No
6		South	69.7	69.8	0.1	No
7		East	56.9	57.1	0.2	No
8		West	65.7	66.0	0.3	No
9	Appian Way/I-80 WB Ramps	North	69.7	69.8	0.1	No
10		South	69.5	69.5	0.0	No
11		East	67.8	67.8	0.0	No
12		West	67.0	67.1	0.1	No
13	Appian Way/I-80 EB Ramps	North	69.5	69.6	0.1	No
14		South	70.1	70.1	0.0	No
15		East	67.6	67.6	0.0	No
16		West	67.0	67.1	0.1	No

Source: Bollard Acoustical Consultants, Inc., 2020.

On-Site Operational Noise

The primary on-site operational noise sources associated with the proposed project would include on-site delivery truck circulation, loading dock activities, rooftop mechanical equipment (HVAC), restaurant drive-through operations, and parking lot movements. An assessment of each project-related noise source is provided below. The locations of the on-site noise sources included in this analysis are shown on Figure 27.

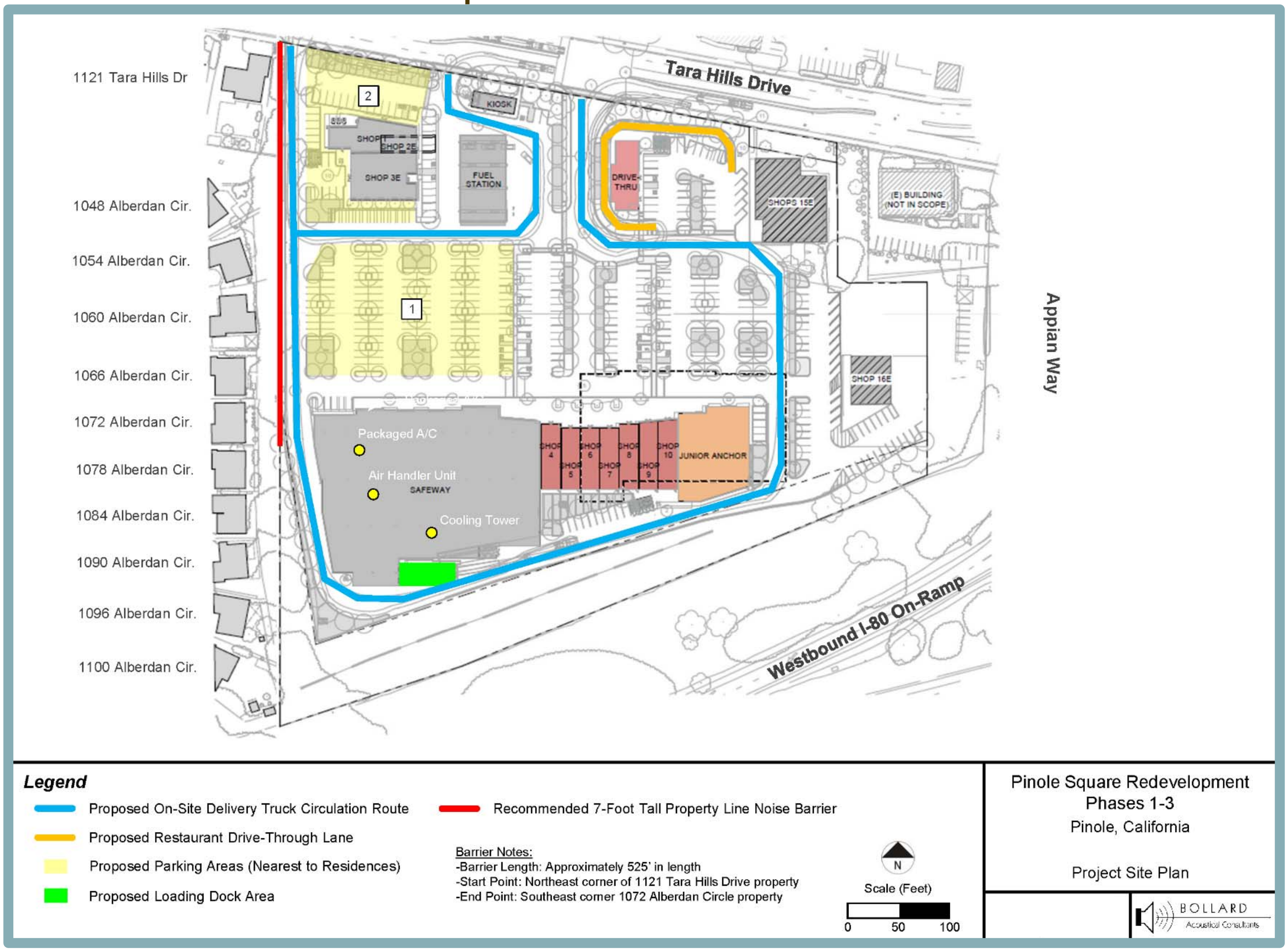
It should be noted that the project site plans indicate that a seven-foot tall solid wood fence is proposed along the entire western project property boundary. However, it is unclear whether the proposed wood fence would be constructed such that it would provide the necessary attenuation needed to perform as a noise barrier. As a result, the following analyses of project-generated noise exposure at the nearest existing residential uses (to the west) do not include offsets associated with a seven-foot tall noise barrier.

On-Site Delivery Truck Circulation Noise

Delivery trucks would access the project site from the westernmost driveway at Tara Hills Drive, similar to existing conditions. Figure 27 shows the proposed on-site delivery truck routes. Heavy truck deliveries would primarily be associated with the fuel station, the Safeway grocery store, and adjacent retail shops near the southern end of the development. Based on this expectation, only medium-duty trucks/vans or smaller would deliver product to the remaining buildings of the development. Such assumptions are based on the proposed building capacities, orientation, and delivery access points indicated in the project site plan.

As noted in the Noise Assessment, similar projects with commercial uses typically can have deliveries during both daytime and nighttime hours. Thus, the following conservative assumptions were made regarding deliveries at the project site:

Figure 27
On-Site Operational Noise Source Locations



Source: Bollard Acoustical Consultants, Inc., 2020.

- Fuel station: 1 heavy truck/2 medium trucks during worst-case hour;
- Shops 1, 2E, and 3E: 2 medium trucks during worst-case hour;
- Safeway and adjacent retail: 3 heavy trucks/5 medium trucks during worst-case hour; and
- Drive-through restaurant: 1 medium truck during worst-case hour.

It is important to note that, with respect to the threshold related to a substantial permanent increase in ambient noise levels, stationary loading dock noises are not expected to increase substantially from existing conditions. The current on-site uses have regular truck deliveries in the rear area, similar to the proposed operations. Thus, the CEQA baseline includes loading dock operations similar to that which would occur under the proposed project. Given that the analysis presented herein does not account for noise associated with existing on-site deliveries, the analysis represents a conservative, worst-case scenario.

Truck deliveries are expected to be relatively brief and would occur at low speeds. To predict noise levels generated by truck deliveries, Bollard Acoustical Consultants, Inc. relied on file data obtained from measurements of heavy- and medium-duty truck passbys. According to Bollard Acoustical Consultants, Inc. data, single-event heavy truck passby noise levels are approximately 74 dB L_{max} and 83 dB SEL at a reference distance of 50 feet. In addition, such file data indicate that single-event medium truck passby noise levels are approximately 66 dB L_{max} and 76 SEL at a reference distance of 50 feet.

Because the City of Pinole General Plan noise standards are provided in terms of both individual maximum noise levels and hourly average noise levels, it is necessary to identify the number of truck movements occurring during a typical busy hour of operations to assess compliance with the L_{eq}-based standards. Based on the worst-case hour truck delivery assumptions discussed above, the following delivery truck hourly average (L_{eq}) reference noise levels at a distance of 50 feet from the truck passby route were computed:

- Fuel station: 48 dB L_{eq} (maximum of 74 dB L_{max});
- Pads 1 and 2 businesses: 43 dB L_{eq} (maximum of 66 dB L_{max});
- Safeway and adjacent retail: 53 dB L_{eq} (maximum of 74 dB L_{max}); and
- Drive-through restaurant: 40 dB L_{eq} (maximum of 66 dB L_{max}).

Based on the reference noise levels above, and assuming standard spherical spreading loss (-6 dB per doubling of distance), on-site delivery truck circulation noise exposure at the property lines of the nearest existing residential uses to the west, northwest, and southwest of the project site was calculated and the results of those calculations are presented in Table 17.

As indicated in the table, on-site delivery truck circulation noise levels are predicted to exceed the applicable City of Pinole General Plan hourly average (L_{eq}) and maximum (L_{max}) adjusted daytime and nighttime noise level standards at a portion of the nearest existing residences to the west, northwest, and southwest of the project site. In addition, project delivery truck circulation noise exposure could be above ambient daytime and nighttime noise levels at the existing sensitive uses. As a result, a potentially significant impact could occur.

Table 17
Predicted On-Site Truck Circulation Noise Levels at the Nearest Existing Sensitive Uses

Nearest Residential Property Lines	Distance from Truck Lane (ft)[1]	Predicted Noise Level (dB)		Applicable City Noise Standards[2]			
				Daytime		Nighttime	
		L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}
West	25	59	80	55	70	54	65
Northwest	25	61	80	60	81	54	65
Southwest	35	57	77	62	82	54	65

[1] Distances measured from the center of the nearest truck circulation lane to the nearest residential property lines.
[2] Applicable noise levels based upon measured ambient conditions from ambient noise level surveys.

Source: Bollard Acoustical Consultants, Inc., 2020.

Loading Dock Activity Noise

The proposed project would include a primary loading dock at the southern side of the Safeway grocery store (see Figure 27). The primary noise sources associated with loading dock areas is the heavy trucks stopping (air brakes), backing into the loading docks (back-up alarms), and pulling out of the loading dock area (revving engines).

To quantify the noise generated by truck loading dock operations, Bollard Acoustical Consultants, Inc. relied on noise level data obtained from field measurements of a commercial warehouse facility. According to the measurement data, loading dock average and maximum noise levels are approximately 63 dB L_{eq} and 75 dB L_{max} at a reference distance of 50 feet.

The existing residential uses to the west and northwest of the project site (located farthest away) would be completely shielded from view of the loading dock area by the proposed grocery store building itself. The worst-case loading dock noise exposure would be at the nearest existing residential uses to the southwest of the project site. Assuming standard spherical spreading loss (-6 dB per doubling of distance), loading dock noise exposure at the property line of the nearest existing residential use to the southwest of the project site was calculated (see Table 18).

Table 18
Predicted Loading Dock Noise Levels at the Nearest Existing Sensitive Uses

Nearest Residential Property Line	Distance from Loading Dock (ft)[1]	Predicted Noise Level (dB)		Applicable City Noise Standards[2]			
				Daytime		Nighttime	
		L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}
Southwest	180	52	64	62	82	54	65

[1] Distances measured from the center of the loading dock area to the property line of the nearest residential use.
[2] Applicable noise levels based upon measured ambient conditions from ambient noise level surveys.

Source: Bollard Acoustical Consultants, Inc., 2020.

As shown in the table, noise levels generated by project loading dock activities are predicted to satisfy the applicable City of Pinole General Plan daytime and nighttime noise level standards at the property lines of the nearest existing residential uses (southwest of the project site). The predicted average hourly (L_{eq}) and maximum (L_{max}) noise levels shown in the table are also below the ambient daytime and nighttime noise levels measured at the nearest existing residential uses to the southwest.

Because project loading dock activity noise level exposure is predicted to satisfy the applicable City of Pinole General Plan daytime and nighttime noise level limits, and because loading dock noise levels are not predicted to significantly increase ambient noise levels at existing sensitive uses, impacts related to loading dock activity noise would be considered less than significant.

Rooftop Mechanical Equipment Noise

The proposed project would include the installation of rooftop mechanical equipment for the proposed commercial development. Such mechanical equipment would be shielded from view of nearby existing residential uses by the building parapets on top of the proposed commercial buildings. Figure 27 shows the proposed locations of the rooftop mechanical equipment. Because mechanical equipment operation typically generates sustained, steady-state, noise levels, impacts of project rooftop mechanical equipment are assessed relative to the City of Pinole General Plan hourly average (L_{eq}) noise level standards.

Noise from rooftop mechanical equipment has been measured by Bollard Acoustical Consultants, Inc. to be 45 to 50 dB at a reference distance of 100 feet from the building facades of similar commercial uses, including shielding by the building parapet. When projected to the property line of the nearest existing residential use located approximately 120 feet from any project-related rooftop mechanical equipment, noise levels are calculated to be approximately 43 dB L_{eq} (including shielding from the building parapet). The predicted rooftop mechanical equipment noise level of 43 dB L_{eq} at the property line of the nearest existing residential use southwest of the project site would satisfy the applicable City of Pinole adjusted daytime and nighttime hourly average noise level limits of 62 and 54 dB L_{eq}, respectively. In addition, the predicted average hourly (L_{eq}) noise level of 43 dB L_{eq} would be below ambient daytime and nighttime noise levels measured at the nearest existing residential uses to the southwest.

Because project rooftop mechanical equipment noise exposure is predicted to satisfy the applicable City of Pinole General Plan daytime and nighttime noise level limits, and because mechanical equipment noise levels are not predicted to significantly increase ambient noise levels at existing sensitive uses, impacts related to HVAC equipment noise would be considered less than significant.

Restaurant Drive-Through Operations Noise

The proposed project would include operation of a restaurant with a drive-through. To quantify the noise exposure of proposed drive-through vehicle passages and speaker usage at the nearest existing residential uses, Bollard Acoustical Consultants, Inc. relied on noise measurement data collected for similar drive-through operations. According to the file data, drive-through speaker and vehicle idling noise levels are approximately 50 dB L_{eq} and 55 dB L_{max} at a reference distance of 50 feet. It should be noted that the proposed speaker would be oriented to face the vehicle occupant. Based on the arrangement of the drive-through aisle, the speaker would face away from existing homes in the project area.

The nearest existing residential uses to the proposed restaurant drive-through lane are located to the west and northwest of the project site. Using the above-mentioned measured reference noise levels, and assuming standard spherical spreading loss (-6 dB per doubling of distance), restaurant drive-through noise exposure at the property lines of the nearest existing residential uses was calculated and the results of those calculations are presented in Table 19.

As shown in the table, noise levels generated by restaurant drive-through operations are predicted to satisfy the applicable City of Pinole General Plan adjusted daytime and nighttime noise level standards at the property lines of the nearest existing residential uses west and northwest of the project site. In addition, the predicted average hourly (L_{eq}) and maximum (L_{max}) noise levels shown in the table are below ambient daytime and nighttime noise levels measured at the nearest existing residential uses to the west and northwest.

Table 19
Predicted Restaurant Drive-Through Noise Levels at the Nearest Existing Sensitive Uses

Nearest Residential Property Lines	Distance from Drive-Through Lane (ft)[1]	Predicted Noise Level (dB)		Applicable City Noise Standards[2]			
				Daytime		Nighttime	
		L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}
West	430	31	36	55	70	54	65
Northwest	420	32	37	60	81	54	65

[1] Distances measured from the drive-through lane to the property lines of the nearest residential uses.
[2] Applicable noise levels based upon measured ambient conditions from ambient noise level surveys.

Source: Bollard Acoustical Consultants, Inc., 2020.

Because project restaurant drive-through operations noise level exposure is predicted to satisfy the applicable City of Pinole General Plan daytime and nighttime noise level limits, and because restaurant drive-through noise levels are not predicted to significantly increase ambient noise levels at existing sensitive uses, impacts related to drive-through operation noise would be considered less than significant.

Parking Lot Activity Noise

As a means of determining potential noise exposure due to project parking lot activities, Bollard Acoustical Consultants, Inc. conducted specific parking lot noise level measurements of multiple vehicle types arriving and departing a parking area, including engines starting and stopping, car doors opening and closing, and persons conversing as they entered and exited the vehicles. The results of such measurements revealed that individual parking lot movements generated mean noise levels of approximately 70 dB SEL at a reference distance of 50 feet. The maximum noise level associated with parking lot activity typically did not exceed 65 dB L_{max} at the same reference distance.

To compute hourly average (L_{eq}) noise levels generated by parking lot activities, the approximate number of hourly operations in any given area and distance to the effective noise center of the activities is required. The parking areas proposed nearest to existing residential uses are located on the west and northwest sides of the project area, identified as Parking Areas 1 and 2 in Figure 27. Parking Areas 1 and 2 would accommodate approximately 150 and 50 parking spaces, respectively. For the purposes of this analysis, all of the parking stalls are conservatively assumed to fill or empty during any given peak hour (worst-case). However, parking area activity would likely be more spread out. Using the information provided above, and assuming standard spherical spreading loss of -6 dB per doubling of distance, worst-case parking area noise exposure at the property lines of the nearest existing residential uses to the west and northwest of the project site was calculated and the results of such calculations are presented in Table 20.

As shown in the table, noise levels generated by project parking lot movements are predicted to satisfy the applicable City of Pinole General Plan adjusted daytime and nighttime noise level standards at the property lines of the nearest existing residential uses (west and northwest of the project site). In addition, the predicted average hourly (L_{eq}) and maximum (L_{max}) noise levels shown in the table are below measured ambient daytime and nighttime noise levels measured at the nearest existing residential uses to the west and northwest. Because project parking area noise level exposure is predicted to satisfy the applicable City of Pinole General Plan adjusted daytime and nighttime noise level limits, and because parking area noise levels are not predicted to significantly increase ambient noise levels at existing sensitive uses, impacts related to parking lot area noise would be considered less than significant.

Table 20
Predicted Parking Area Noise Levels at the Nearest Existing Sensitive Uses

Nearest Residential Property Lines	Distance from Noise Center of Parking Area (ft)[1]	Predicted Noise Level (dB)		Applicable City Noise Standards[2]			
				Daytime		Nighttime	
		L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}
West	250 (Parking Area 1)	42	51	55	70	54	65
Northwest	100 (Parking Area 2)	45	59	60	81	54	65

[1] Distances measured from the effective noise center the parking areas to the property lines of the nearest residential uses.
[2] Applicable noise levels based upon measured ambient conditions from ambient noise level surveys.

Source: Bollard Acoustical Consultants, Inc., 2020.

Combined Noise Levels from On-Site Operations

The calculated combined noise levels associated with all of the on-site operational noise sources described above at the nearest existing residential uses are presented in Table 21. It should be noted that due to the logarithmic nature of the decibel scale, the sum of two noise values that differ by 10 dB equates to an overall increase in noise levels of 0.4 dB. When the noise sources are equivalent, the sum would result in an overall increase in noise levels of 3 dB.

As shown in the table, the combined noise levels from all on-site operational sources discussed in the preceding sections could exceed the applicable City of Pinole General Plan hourly average (L_{eq}) and maximum (L_{max}) adjusted daytime and nighttime noise level standards at a portion of the nearest existing residential property lines. In addition, the combined noise levels could be above ambient daytime and nighttime noise levels at existing sensitive uses. As a result, a potentially significant impact could occur associated with on-site operational noise.

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Table 21
Predicted Combined Noise Levels at the Nearest Existing Sensitive Uses

Nearest Residential Property Lines	Predicted Noise Level (dB)[1]										Applicable City Noise Standards[2]			
	Truck Circulation		Loading Dock		HVAC	Drive-Through		Parking Area		Combined		Daytime		Nighttime	
	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}
West	59	80	31	43	39	31	36	42	51	59	80	55	70	54	65
Northwest	61	80	27	39	33	32	37	45	59	61	80	60	81	54	65
Southwest	57	77	52	64	43	<20	<20	26	34	58	77	62	82	54	65

[1] Distances measured from the effective noise center the parking areas to the property lines of the nearest residential uses.
[2] Applicable noise levels based upon measured ambient conditions from ambient noise level surveys.

Source: Bollard Acoustical Consultants, Inc., 2020.

Conclusion

Based on the above, construction activities associated with the proposed project could result in a temporary increase in ambient noise levels at the nearest existing sensitive uses to the site and could conflict with the stationary source noise standards established by General Plan Policy HS 9.1. In addition, on-site delivery truck circulation noise levels, as well as the combined noise levels associated with all on-site operational noise sources, are predicted to exceed the applicable City of Pinole General Plan hourly average (L_{eq}) and maximum (L_{max}) daytime and nighttime noise level standards at a portion of the nearest existing residences to the west, northwest, and southwest of the project, and could be above ambient daytime and nighttime noise levels at existing sensitive uses. Thus, the proposed project could generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local General Plan or noise ordinance, or applicable standards of other agencies, and a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Per the Noise Assessment, implementation of the measures included in Mitigation Measure XIII-1 below would reduce the identified construction noise impact to a less-than-significant level.

With regard to on-site operational noise sources, implementation of Mitigation Measures XIII-2 and XIII-3 below would ensure satisfaction of the applicable General Plan daytime noise level limits at the nearest existing residential uses to west, northwest, and southwest of the project, for both truck circulation noise only and (see Table 22) and for combined noise from all on-site operations (see Table 23). The resulting noise levels at the nearest residential uses, after construction of the required seven-foot tall barrier, includes consideration of a shielding offset to account for the substantial difference in elevations between the elevated project site and depressed sensitive areas of the of the adjacent residential uses, which is estimated to be approximately -3 dB.

Based on the above, implementation of the following mitigation measures would reduce the above potential impact to a *less-than-significant* level.

XIII-1 *To the maximum extent practical, the following measures shall be included, via written notation, on final improvement plans for the project prior to review and approval by the City:*

- *Pursuant to City of Pinole General Plan Action HS.8.1.5, the project shall utilize temporary construction noise control measures including the use of temporary noise barriers, or other appropriate measures as mitigation for noise generated during construction of projects.*
- *Pursuant to Pinole Municipal Code Section 15.02.070(A), construction work is allowed from 7:00 AM to 5:00 PM on non-federal holidays. Construction work is allowed on holidays recognized by the City of Pinole, but not acknowledged federally, which include Cesar Chavez's Birthday and the Day after Thanksgiving; however, inspections will not be performed.*

Table 22
Predicted On-Site Truck Circulation Noise Levels at the Nearest Existing Sensitive Uses – with Mitigation

Nearest Residential Property Lines	Predicted Noise Level (dB)		Applicable City Noise Standards[2]	
	L_{eq}	L_{max}	L_{eq}	L_{max}
West	59	80	55	70
Northwest	61	80	60	81

[1] Predicted noise levels take into consideration the screening provided by a seven-foot tall noise barrier along the property line (as indicated in Figure 27), shielding provided by intervening on-site buildings (where applicable, as well as for a shielding offset to account for a difference in elevations between the elevated truck lane and depressed sensitive areas of adjacent residential uses.
[2] Applicable noise levels based upon measured ambient conditions from ambient noise level surveys.

Source: Bollard Acoustical Consultants, Inc., 2020.

Table 23
Predicted Combined Noise Levels at the Nearest Existing Sensitive Uses – with Mitigation

Nearest Residential Property Lines	Predicted Noise Level (dB)[1]											Applicable City Noise Standards[2]			
	Truck Circulation		Loading Dock		HVAC	Drive-Through		Parking Area		Combined		Daytime		Nighttime	
	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}
West	49	70	20	32	29	20	25	30	40	49	70	55	70	54	65
Northwest	51	70	<20	28	23	21	26	34	58	51	70	60	81	54	65
Southwest	57	77	52	64	43	<20	<20	26	34	58	77	62	82	54	65

1. Predicted noise levels take into consideration the screening provided by a seven-foot tall noise barrier along the property line (as indicated in Figure 27), shielding provided by intervening on-site buildings (where applicable, as well as for a shielding offset to account for a difference in elevations between the elevated project site and depressed sensitive areas of adjacent residential uses.
2. Applicable noise levels based upon measured ambient conditions from ambient noise level surveys.

Source: Bollard Acoustical Consultants, Inc., 2020.

- *Pursuant to Pinole Municipal Code Section 15.02.070(B), construction work on Saturdays is allowed in commercial zones only, from 9:00 AM to 6:00 PM, as long as the work is interior work and does not generate significant noise.*
- *All noise-producing project equipment and vehicles using internal-combustion engines shall be equipped with manufacturers-recommended mufflers and be maintained in good working condition.*
- *All mobile or fixed noise-producing equipment used on the project site that are regulated for noise output by a federal, State, or local agency shall comply with such regulations while in the course of project activity.*
- *Electrically powered equipment shall be used instead of pneumatic or internal-combustion-powered equipment, where feasible.*
- *Material stockpiles and mobile equipment staging, parking, and maintenance areas shall be located as far as practicable from noise-sensitive receptors.*
- *Project area and site access road speed limits shall be established and enforced during the construction period.*
- *Nearby residences shall be notified of construction schedules so that arrangements can be made, if desired, to limit their exposure to short-term increases in ambient noise levels.*

XIII-2 *Prior to approval by the City, final improvement plans for the proposed project shall provide for the construction of a solid noise barrier measuring seven-feet in height along the project property boundary, as indicated in Figure 27 of this IS/MND. The design and materials for the noise barrier shall be subject to approval by the City Engineer.*

XIII-3 *The project applicant shall ensure that all future vendor contracts include language limiting project truck deliveries to daytime hours only (7:00 AM to 10:00 PM), to the satisfaction of the City of Pinole.*

b. Per the Noise Assessment, project operations would not generate an appreciable level of vibration. However, during project construction, heavy equipment would be used for grading, excavation, paving, and building construction, which would generate localized vibration in the immediate vicinity of the construction activities. The nearest existing sensitive uses are residential structures located approximately 50 feet from where construction activities would occur within the project site. For structural damage, the California Department of Transportation (Caltrans) uses a vibration limit of 0.50 inches/second, peak particle velocity (in/sec, PPV), for modern industrial/commercial/residential buildings, and 0.30 in/sec PPV for older residential structures.

Table 24 includes the range of vibration levels for equipment commonly used in general construction projects at a distance of 25 feet. The Table 16 data also include predicted equipment vibration levels at the nearest existing residences to the project site located approximately 50 feet away. As shown in the table, vibration levels generated from on-site construction activities at the nearest existing residences are predicted to be below the strictest Caltrans threshold for damage to residential structures of 0.30 in/sec PPV.

Furthermore, the predicted vibration levels are below the applicable Caltrans thresholds for annoyance.

Table 24
Vibration Source Levels for Construction Equipment and Predicted Levels at 50 Feet

Equipment	Maximum PPV (in/sec)	
	Maximum PPV at 25 Feet	Maximum PPV at 50 Feet
Hoe ram	0.089	0.032
Large bulldozer	0.089	0.032
Caisson drilling	0.089	0.032
Loaded trucks	0.076	0.027
Jackhammer	0.035	0.012
Small bulldozer	0.003	0.011

Source: Bollard Acoustical Consultants, Inc., 2019.

Consequently, vibration generated by construction activities associated with the proposed project are not expected to be perceptible at nearby sensitive receptors, and the construction-generated vibrations would not be expected to result in structural damage to nearby buildings. Furthermore, construction activities associated with implementation of the proposed project would be temporary and construction equipment would operate intermittently throughout the course of a day, would be restricted to daytime hours per the City's Municipal code, and would likely only occur over portions of the improvement area at a time. Therefore, the project would not involve the generation of excessive groundborne vibration or noise levels and a ***less-than-significant*** impact would result.

c. The nearest airport to the project site is Buchanan Field Airport, located approximately 13 miles east of the site. As such, the project site is not located within two miles of any public airports, and does not fall within an airport land use plan area. Given that the proposed project is not located within two miles of a public or private airport, the proposed project would not expose people residing or working in the project area to excessive noise levels associated with airports. Thus, ***no impact*** would occur.

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

Discussion

a. Currently, the site is developed with the Appian 80 Shopping Center, which includes a Safeway grocery store, a vacant CVS pharmacy, and various other smaller businesses totaling approximately 93,193 sf. The proposed project would include demolition of a portion of the existing on-site structures and construction of new commercial buildings. Upon completion of the proposed redevelopment, the project site would include a total of 105,149 sf of commercial uses. While the project would represent a slight increase in the amount of commercial development on-site, the project would be consistent with the intensity of development anticipated for the site per the site's current General Plan/Specific Plan land use and zoning designations. Thus, indirect population growth associated with continued operation of commercial uses on the site has been planned by the City, and associated impacts have been analyzed in the General Plan EIR.[48] Therefore, the proposed project would not induce substantial unplanned population growth, and a ***less-than-significant*** impact would occur.

b. The project site does not contain any existing housing, and many of the commercial structures that would be demolished as part of the proposed project are currently vacant. Therefore, the proposed project would not displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere, and ***no impact*** would occur.

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48 City of Pinole. *General Plan Update Draft Environmental Impact Report, SCH #2009022057.* July 2010.

XV. PUBLIC SERVICES.

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

Discussion

a-e. The Pinole Fire Department (PFD) shares the Public Safety Building located approximately 1.3 miles east of project site, with the Pinole Police Department (PPD). In September of 2000, the PFD, the Contra Costa County Fire Protection District, and the Rodeo-Hercules Fire Protection District began a cooperative agreement to establish and function as “Battalion 7.” The purpose of Battalion 7 was to respond to the large percentage of calls involving automatic or mutual aid between the departments. The City of Pinole’s fire stations are located at 880 Tennent Avenue in the Public Safety Building (Station 73) and 3700 Pinole Valley Road (Station 74).

The proposed redevelopment project would result in a net increase of approximately 11,956 sf relative to the 93,193 sf of existing on-site commercial uses. Given the relatively minor increase in square footage that would occur as a result of the proposed project, the project would not substantially increase demand for fire protection, police protection, or other public services relative to what currently occurs. Additionally, the proposed project would incorporate a sprinkler system that would reduce fire risk at the site and reduce the likelihood of PFD services being needed at the project site. The project includes a lighting plan, which when implemented, would provide security lighting at the project site to reduce demand on PPD to the extent feasible. Thus, the project would not require the provision of new or physically altered fire or police protection facilities beyond what was analyzed in the General Plan EIR.[49]

Furthermore, the proposed project would not result in direct population growth, and, consequently, would not increase the demand for schools, parks, or other public facilities. Therefore, the proposed project would have a ***less-than-significant*** impact related to the need for new or physically altered fire protection, police protection, schools, parks, or other public facilities, the construction of which could cause significant environmental impacts.

49 City of Pinole. *General Plan Update Draft Environmental Impact Report, SCH #2009022057.* July 2010.

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

Discussion

a,b. The proposed project would consist solely of commercial uses and, thus, would not introduce any new residents to the project site. The proposed project would not result in population growth that could result in increased use of existing recreational facilities, nor would the proposed project include or require construction or expansion of recreational facilities. Thus, a ***less-than-significant*** impact would occur.

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

Discussion

a. The following is based primarily on a Transportation Impact Study prepared for the proposed project by TJKM (see Appendix G).[50]

TJKM evaluated traffic conditions at four study intersections during the AM and PM peak hours for a typical weekday. The peak periods observed were between 7:00 and 10:00 AM and 4:00 and 7:00 PM. The highest single one hour recorded for each peak period was used in the analysis. The study intersections and associated traffic controls are as follows (see Figure 28):

1. Tara Hills Drive at project entrance (Signalized);
2. Appian Way and Tara Hills Drive (Signalized);
3. Appian Way and I-80 westbound (WB) Ramps (Signalized); and
4. Appian Way and I-80 eastbound (EB) Ramps (Signalized).

Study Scenarios

Conditions at each intersection were analyzed under the following scenarios:

- Existing Conditions – This scenario describes existing transportation conditions relevant to the study area, including characteristics of key roadways and transit service, and existing conditions for walking and bicycling.
- Existing Plus Project Conditions – This scenario describes the anticipated effects of the proposed project relative to Existing conditions, including the addition of traffic from the proposed project to study intersections.
- Cumulative No Project Conditions – This scenario describes anticipated transportation conditions in 2040 using a growth rate based on the volumes obtained from the CCTA 2040 travel demand model.
- Cumulative Plus Project Conditions – This scenario describes anticipated transportation conditions in 2040 that include the proposed project. Cumulative impacts resulting from the project are assessed based on the net change from Cumulative No Project conditions.

[50] TJKM. *Pinole Square, Transportation Impact Study.* February 21, 2020.

Figure 28
Study Intersection Locations

Source: TJKM, 2019.

Thresholds of Significance

Operations at each of the study intersections were evaluated based on Level of Service (LOS), a qualitative measure that describes operational conditions as they relate to the traffic stream and perceptions by motorists and passengers. The LOS generally describes these conditions in terms of such factors as speed and travel time, delays, freedom to maneuver, traffic interruptions, comfort, convenience, and safety. The operational LOS are given letter designations from A to F, with A representing the best operating conditions (free-flow) and F the worst (severely-congested flow with high delays). Intersections generally are the capacity-controlling locations with respect to traffic operations on arterial and collector streets. Table 25 summarizes the relationship between the control delay and LOS for signalized intersections.

Table 25
Signalized Intersection LOS Criteria

LOS	Description
A	Very low control delay, up to 10 seconds per vehicle. Progression is extremely favorable, and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.
B	Control delay greater than 10 and up to 20 seconds per vehicle. Good progression or short cycle lengths are available, or both. More vehicles stop causing higher levels of delay.
C	Control delay greater than 20 and up to 35 seconds per vehicle. Higher delays are caused by fair progression or longer cycle lengths or both. Individual cycle failures may begin to appear. Cycle failure occurs when a given green phase does not serve queued vehicles, and overflow occurs. The number of vehicles stopping is significant, though many still pass through the intersection without stopping.
D	Control delay greater than 35 and up to 55 seconds per vehicle. The influence of congestions becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volumes. Many vehicles stop, the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Control delay greater than 55 and up to 80 seconds per vehicle. The limit of acceptable delay. High delays usually indicate poor progression, long cycle lengths, and high volumes. Individual cycle failures are frequent.
F	Control delay in excess of 80 seconds per vehicle. Unacceptable to most drivers. Oversaturation, arrival flow rates exceed the capacity of the intersection. Many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to higher delay.

Source: TJKM, 2019.

City of Pinole Traffic Impact Criteria

City of Pinole LOS standards specify that the minimum acceptable operation for signalized intersections is LOS D or better. The Pinole General Plan notes that increases in daily volumes on San Pablo Avenue, Appian Way, and Pinole Valley Road associated with anticipated growth in the region will slowly begin to exceed the capacity of the roadways.

Caltrans Traffic Impact Criteria

Per Caltrans guidelines, Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on State highway facilities; however, Caltrans acknowledges that such standards may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State highway facility is operating at less than the appropriate target LOS, the existing Measure of Effectiveness should be maintained. For the purposes of this analysis, LOS thresholds were considered to be LOS D for those within both the City and Caltrans jurisdiction.

Pedestrian and Bicycle Impact Criteria

Impacts to pedestrian and bicycle circulation would be considered potentially significant if the proposed project would result in the following:

- Create a hazardous condition that currently does not exist for pedestrians or bicyclists, or otherwise interfere with pedestrian accessibility to the project and adjoining areas;
- Conflict with an existing or planned pedestrian or bicycle facility; or
- Conflict with policies related to bicycle and pedestrian activity adopted by the City of Pinole.

Transit Impact Criteria

Impacts to transit would be considered potentially significant if the proposed project would result in the following:

- Conflict with existing or planned transit services;
- Create demand for public transit services above the capacity that is provided or planned; or
- Conflict with transit policies adopted by the City of Pinole or CCTA.

Trip Generation and Distribution

Project vehicle trip generation was estimated using rates from the Institute of Transportation Engineers (ITE) Trip Generation Manual (10th Edition). Table 26 shows the trip generation was based on the difference between the number of vehicle trips generated by the proposed building areas and the existing building areas. It should be noted that trip generation calculations do not include Shops 15E and Shop 16E, which remain unaltered as a part of the proposed project. Existing traffic volumes from the two buildings use the main project driveway, and are, thus, included in both the existing and cumulative scenarios based on existing field counts. As discussed in Section XIII, Noise, of this IS/MND, subsequent to preparation of the Transportation Impact Assessment, the existing and proposed building square footages were refined, which resulted in slight decreases in the total existing and proposed building areas. In response to the building area refinements, TJKM identified that, although the changes in square footage would result in a slight increase in the number of net new vehicle trips, the increase would not change the conclusions presented in the Transportation Impact Study prepared for the project.

The proposed project is expected to generate a net increase of approximately 87 weekday AM peak hour trips (44 inbound trips, 43 outbound trips), and 151 weekday PM peak hour trips (76 inbound trips, 74 outbound trips), and a total of 2,919 net new daily trips. It should be noted that since the preparation of the Transportation Impact Study, the total square footage of the existing on-site development was revised slightly; however, per TJKM, the revision does not affect the analysis, conclusions, or recommendations provided in the Transportation Impact Study.[51]

[51] TJKM. *Technical Memorandum, Pinole Square Traffic Study.* January 2, 2020.

Table 26
Project Vehicle Trip Generation

Land Use	ITE Code	Size	Daily		AM Peak Hour						PM Peak Hour					
			Rate	Trips	Rate	In %	Out %	In	Out	Total	Rate	In %	Out %	In	Out	Total
EXISTING BUILDING AREAS																
Shopping Center[1] (Excludes parcel 15e+16e)	**820**	82,860	**63.85**	**5,290**	**2.33**	62	38	120	73	**193**	**5.71**	48	52	227	246	**473**
Pass-By Trip Reduction (PM Peak Hour-34%)[2]														-77	-84	-161
Total Vehicle Trips				**5,290**				120	73	**193**				150	162	**312**
Total Vehicle Trips				5,290				120	73	**193**				150	162	**312**
PROPOSED BUILDING AREAS																
Shopping Center[1] (See note 9)	**820**	89,190 sq. ft.	**62.36**	**5,562**	**2.20**	62	38	122.0	74.4	**196.4**	**5.6**	48.0	52.0	240	259	**499**
Pass-By Trip Reduction (PM Peak Hour-34%)[2]														-81	-89	-170
Total Trips for Shopping Center				**5,562**				122.0	74.4	**196.4**				159	170	**329**
Gasoline/Service Station[3]	**944**	16 Fueling Positions	**172.01**	**2,752**	**10.28**	50	50	82	82	**164**	**14.03**	50	50	112	112	**224**
Internal Trip Reduction (AM Peak Hour-50%, PM Peak Hour-50%)[4]				-1,376				-41	-41	-82				-56	-56	-112
Pass-by Trip Reduction (AM Peak Hour-58%, PM Peak Hour-42%)[5]								-24	-24	-48				-24	-23	-47
Total Trips for Gasoline Station				**1,376**				17	17	**34**				32	33	**65**
Drive Through Restaurant[6]	**934**	3,005 sq. ft.	**470.95**	**1,413**	40.2	51.0	49.0	62	59	**121**	33	52	48	51	47	**98**
Internal Trip Reduction (AM Peak Hour-10%, PM Peak Hour-10%)[7]				-141.3				-6	-6	-12				-5	-5	-10
Pass-by Trip Reduction (AM Peak Hour-49%, PM Peak Hour-21%)[8]								-31	-29	-59				-11	-9	-20
Total Trips for Drive Through Restaurant				**1,272**				25	24	**50**				35	33	**68**
Total Vehicle Trips				**8,210**				164	116	**280**				226	237	**462**
TRIP DIFFERENCE																
Total Vehicle Trips From Proposed Building Areas				**8,210**				164	116	**280**				226	237	**462**
Total Vehicle Trips From Existing Building Areas				**5,290**				120	73	**193**				150	162	**312**
Net New Vehicle Trips (Proposed-Existing)				**2,919**				44	43	**87**				76	74	**150**

Source - Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition, 2017.

[1] Shoping Center (ITE Land Use Code 820) fitted curve equations are based upon number of thousand square feet gross leasable area. Fitted curve equation for Daily: Ln(T)=0.68 Ln(X)+5.57; AM Peak: T=0.50(X)+151.78; PM Peak: Ln(T)=0.74 Ln(X)+2.89. Where T=Average Vehicle Trip Ends; X=Land Use Size in ksf (One Thousand Square Feet).

[2] ITE Pass-By reduction rate of 34% in the PM peak hour for Retail Land Use.

[3] Gasoline/Service Station (ITE Land Use Code 944) vehicle trip rates are based upon number of fueling positions.

[4] Internal trip reduction of 50% applied to reflect internal trips between the Safeway Grocery Store and Safeway Gasoline Pump.

[5] ITE Pass-By reduction rate of 58% in the AM peak hour and 42% in the PM peak hour was applied to internal trips for From Safeway Grocery Store to Safeway Gasoline Pump.

[6] Drive Through Restaurant or Fast-Food Restaurant with Drive-Through Window (ITE Land Use Code 934) vehicle trip rates are based upon number of thousand square feet gross leasable area.

[7] Internal trip reduction of 10% applied to reflect internal trips between Shopping Center and Drive Through Restaurant.

[8] ITE Pass-By reduction rate of 49% in the AM peak hour and 21% in the PM peak hour for Drive Through Restaurant.

[9] Site Plan shows total of 105,149 square feet. Excluding sites 15e+16e (11,854 square feet), service station kiosk (1,100 square feet), and Drive-Through (3,005 square feet) yields 89,190 square feet.

[10] It should be noted that the existing project area was reduced by 1,521 square feet (resulting in 81,339 square feet of analysis area), and the proposed project area increased by 178 square feet (resulting in 89,368 square feet of analysis area) post completion of traffic analysis of this report. However, these changes do not change the conclusions of the Traffic Impact Analysis.

Trip distribution assumptions for the proposed project were developed based on existing travel patterns and knowledge of the study area. Table 27 illustrates the predicted distribution of project vehicle trips.

Existing Plus Project Conditions

Project trips, as represented in the project trip assignment discussed above, were added to the existing traffic volumes to obtain Existing Plus Project traffic volumes. The results of the intersection LOS analysis under Existing Plus Project conditions are summarized in Table 27 below. As shown in the table, while the addition of project traffic would slightly increase average delay at the study intersections, the overall intersection operations would not degrade beyond the established LOS standard. Thus, impacts to study intersections under Existing Plus Project conditions would be less than significant.

Table 27
Study Intersection LOS: Existing Plus Project Conditions

Intersection	Control	Peak Hour	Existing			Existing Plus Project		
			LOS	Delay	V/C Ratio	LOS	Delay	V/C Ratio
1. Tara Hills Drive at project entrance	Signal	AM	B	12.1	0.44	B	14.0	0.47
		PM	B	15.5	0.42	B	18.2	0.49
2. Appian Way and Tara Hills Drive	Signal	AM	D	37.5	0.61	D	38.4	0.63
		PM	C	34.4	0.57	D	35.8	0.60
3. Appian Way and I-80 WB Ramps	Signal	AM	D	36.6	0.87	D	37.4	0.88
		PM	C	31.4	0.74	C	31.8	0.75
4. Appian Way and I-80 EB Ramps	Signal	AM	A	8.6	0.54	A	8.7	0.54
		PM	A	7.8	0.63	A	8.0	0.63

Note: Whole intersection weighted average control delay expressed in seconds per vehicle for signalized intersections.

Source: TJKM, 2020.

Cumulative Plus Project Conditions

Cumulative No Project volumes were forecasted using an annual growth factor of 0.38 percent for the year 2040 based on the volumes obtained from the current version of the CCTA Travel Demand Model. The Cumulative Plus Project traffic volumes were based on the trip generation, distribution, and assignment as applied to the analysis of Existing Plus Project conditions.

The growth rate from 2018 to 2040 was calculated for four locations on Appian Way: between Tara Hills Drive and I-80 WB Ramps; I-80 WB and EB Ramps; I-80 EB Ramps and Fitzgerald Drive; and Fitzgerald Drive and Michael Drive. The average growth rate for the AM peak hour was found to be 0.38 percent and for PM peak hour was found to be 0.33 percent. The higher growth rate of 0.38 percent was assumed for both AM and PM peak hours for the project.

The results of the intersection LOS analysis under Cumulative Plus Project conditions are summarized in Table 28. As shown in the table, the addition of project traffic would slightly increase average delay at the study intersections. However, the overall intersection operations would not degrade beyond the established LOS standard. Thus, impacts to study intersections under Cumulative Plus Project conditions would be ***less than significant***.

Figure 29
Vehicle Trip Distribution

Source: TJKM, 2020.

Table 28
Study Intersection LOS: Cumulative Plus Project Conditions

Intersection	Control	Peak Hour	Cumulative No Project			Cumulative Plus Project		
			LOS	Delay	V/C Ratio	LOS	Delay	V/C Ratio
1. Tara Hills Drive at project entrance	Signal	AM	B	12.9	0.47	B	14.9	0.50
		PM	B	16.6	0.45	B	19.4	0.52
2. Appian Way and Tara Hills Drive	Signal	AM	D	39.1	0.67	D	40.3	0.68
		PM	D	35.5	0.61	D	36.9	0.65
3. Appian Way and I-80 WB Ramps	Signal	AM	D	50.3	0.95	D	52.9	0.96
		PM	C	33.4	0.80	C	33.7	0.82
4. Appian Way and I-80 EB Ramps	Signal	AM	A	9.3	0.59	A	9.5	0.59
		PM	A	8.7	0.68	A	8.8	0.69

Note: Whole intersection weighted average control delay expressed in seconds per vehicle for signalized intersections.

Source: TJKM, 2020.

Pedestrian, Bicycle, and Transit Facilities

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

Pedestrian Facilities

Pedestrian facilities are comprised of crosswalks, sidewalks, pedestrian signals, and off-street paths, which provide safe and convenient routes for pedestrians to access destinations such as institutions, businesses, public transportation, and recreation facilities. The existing sidewalk network in the project vicinity provides connections to the project site from all nearby areas. All study intersections in the project vicinity are equipped with marked crosswalks, push buttons, and pedestrian countdown heads. Existing pedestrian facilities in the study area are shown in Figure 30. Per the Transportation Impact Analysis, the proposed project would not conflict with an existing or planned pedestrian facility, nor would the project conflict with policies related to pedestrian travel adopted by the City of Pinole. Thus, a less-than-significant impact would occur with regard to pedestrian facilities.

Bicycle Facilities

The existing bicycle facilities in the study area are shown in Figure 30. As shown the figure, Appian Way does not include any dedicated bicycle facilities within the project vicinity. The nearest bicycle infrastructure in the vicinity of the project site is a Class II bike lane that begins 200 feet south of Appian Way and Mann Drive and continues north without providing any connection to the project site. Per the Circulation Element of the City's General Plan, Class I and Class II bicycles facilities are planned in the vicinity of the project area on Appian Way.

The addition of two right-in, right-out driveways at the project site would offer bicyclists the opportunity to safely access the proposed development. In addition, the proposed shopping center would provide bike racks to encourage active transportation. The project is expected to add a few trips to the existing and planned facilities, but is not anticipated to create a hazardous condition for bicyclists or otherwise interfere with bicycle accessibility to the project and adjoining areas.

Figure 30
Existing Pedestrian and Bicycle Facilities

Source: TJKM, 2020.

The project would not conflict with an existing or planned bicycle facility or conflict with policies related to bicycle activity adopted by the City of Pinole. Thus, a ***less-than-significant impact*** would occur.

Transit Facilities

Bus service in the City of Pinole is provided by WestCAT, which operates local fixed routes, Express and transbay routes, and Paratransit within its service area. Five local fixed routes, 16, 17, 18, 19, and C3-Connection, serve the City's residential and commercial areas. The closest bus stop to the project entrance is approximately 0.2-mile east on Appian Way, serving bus route 17. The existing transit facilities in the study area are shown in Figure 31. It should be noted that while a portion of the bus stops along Tara Hills Drive are currently inactive, WestCAT will consider reactivating such stops in the future based on ridership levels.

WestCAT routes 16 and 17 currently operate below capacity. Additional trips generated by the proposed project could be accommodated by the existing transit service and are not anticipated to create significant demand for public transit services above the capacity that is provided or planned. The project would not conflict with transit policies adopted by the City of Pinole or WestCAT for their respective facilities in the study area. Therefore, impacts to transit services and facilities would be less than significant.

Conclusion

Based on the above, the proposed project would not result in significant impacts to any of the study intersections under Existing Plus Project or Cumulative Plus Project conditions. In addition, the project would not conflict with any applicable standards related to pedestrian facilities, bicycle facilities, or transit services and facilities. Therefore, the proposed project would not conflict with an applicable plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities, and a ***less-than-significant*** impact would occur.

b. Section 15064.3 of the CEQA Guidelines provides specific considerations for evaluating a project's transportation impacts. Per Section 15064.3, analysis of vehicle miles travelled (VMT) attributable to a project is the most appropriate measure of transportation impacts. Other relevant considerations may include the effects of the project on transit and non-motorized travel. Except as provided in Section 15064.3(b)(2) regarding roadway capacity, a project's effect on automobile delay does not constitute a significant environmental impact under CEQA. It should be noted that currently, the provisions of Section 15064.3 apply only prospectively; determination of impacts based on VMT is not required Statewide until July 1, 2020.

Per the Transportation Impact Study, most of the vehicle trips associated with the proposed project would be made by customers and shoppers. To the extent that the project grows in daily and peak hour traffic, a commensurate reduction in traffic in other similar locations in the region is assumed to occur, either due to the project being located closer for new customers or because the project has newer and more attractive facilities.

Figure 31
Existing Transit Facilities

Source: TJKM, 2020.

The location of the project site is central to the communities outside of, but near, the City of Pinole north of I-80, including Tara Hills, Bayview and Montalvin Manor. The only other shopping center inclusive of a major grocery store such as Safeway near the project area is the Pinole Vista Shopping Center, which includes Lucky, a grocery store, on Fitzgerald Drive south of I-80. Making trips for groceries to Pinole Vista Shopping Center requires community members, especially in the community of Tara Hills, to traverse local streets in Tara Hills to San Pablo Avenue, connect to Richmond Parkway, and finally reach Fitzgerald Drive.

The redevelopment of the existing on-site shopping center with the convenience of a major grocery store, several restaurants and other retail facilities would discourage such extra miles travelled to access grocery stores and retail facilities far off, and help reduce the VMT in the area. Per the Office of Planning and Research (OPR) Technical Advisory On Evaluating Transportation Impacts in CEQA, if a redevelopment project "[…] leads to a net increase in provision of locally-serving retail, transportation impacts from the retail portion of the development should be presumed to be less than significant."[52] Given that the project would be anchored by a major grocery store, the project would be considered to provide locally-serving retail and, thus, the aforementioned OPR guidance is applicable to the proposed project.

In addition, as noted in question 'a' above, the proposed project would include access to public transit and pedestrian facilities, and would include on-site bike racks and lockers to encourage increased bicycle mode share. The proximity of alternative transportation infrastructure would encourage use of non-vehicle means of transportation to and from the project site.

Based on the above, the proposed project would not conflict or be inconsistent with CEQA Guidelines Section 15064.3(b), and a ***less-than-significant*** impact would occur.

c. Currently, the project site is accessible at three locations on Tara Hills Drive, including an access at a signalized intersection and two driveways with right-in and right-out access to the site. The proposed project would retain the existing site access configuration.

Per the Transportation Impact Study, the proposed internal circulation plan would provide truck traffic with direct access to the back of Safeway and other stores on the site. A convenient access to the Safeway gasoline station would be provided directly from Tara Hills Drive. In the event that traffic might back-up to fuel at the gasoline station, the circulation around the gasoline station ensures that hindrance to traffic approaching or exiting other stores and restaurants on the site would not occur.

Ample queue length is provided for vehicular traffic anticipated at the drive-through restaurant. As per the proposed site plan, a queue length of twelve vehicles is provided at the restaurant with a provision to accommodate an additional three more vehicles prior to blocking any internal circulation isles. Per TJKM, the estimated maximum vehicular traffic that could queue up at most drive-through restaurants is 15 vehicles. Consequently, the queue length provided for the proposed drive-through restaurant would be adequate.

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[52] Office of Planning and Research. *Technical Advisory on Evaluating Transportation Impacts in CEQA.* December 2018.

Based on the above, the proposed project would not substantially increase hazards due to design features or incompatible uses, and a ***less-than-significant*** impact would occur.

d. Sufficient emergency access is determined by factors such as number of access points, roadway width, and proximity to fire stations. The proposed project includes three vehicle access points for emergency vehicles and the internal drive aisles within the project site would be able to adequately accommodate emergency vehicles. Therefore, the proposed project would not result in inadequate emergency access, and a ***less-than-significant*** impact would occur.

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

Discussion

a,b. As discussed in Section V, Cultural Resources, of this IS/MND, the NAHC Sacred Lands File did not yield any information regarding the presence of Tribal Cultural Resources within the project site or immediate area. However, per the CHRIS search, a moderate potential exists for unrecorded Native American Tribal Cultural Resources to occur within the project area.

In compliance with AB 52 (Public Resources Code Section 21080.3.1), a project notification letter was distributed to the Amah Mutsun Tribal Band, the Amah Mutsun Tribal Band of Mission San Juan Bautista, the Indian Canyon Mutsun Band of Costanoan, the Muwekma Ohlone Indian Tribe of the SF Bay Area, the North Valley Yokuts Tribe, and the Ohlone Indian Tribe. Three of the tribes provided responses within the 30-day response period, which ended July 31st, 2019; however, none of the tribes requested initiation of formal consultation.

Based on the results of the CHRIS search, the possibility exists that construction associated with the proposed project could result in a substantial adverse change in the significance of a Tribal Cultural Resource if previously unknown Tribal Cultural Resources are uncovered during grading or other ground-disturbing activities. Thus, a ***potentially significant*** impact to Tribal Cultural Resources could occur.

Mitigation Measure(s)

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

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

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

Discussion

a,c. Water supply service, wastewater service, and stormwater conveyance for the proposed project would continue to be provided by the City of Pinole through connections to existing utility infrastructure in the project site vicinity. The utility improvements included in the proposed project are shown in Figure 32 and Figure 33 below. As part of the proposed project, a portion of the existing water lines, water meters, storm drain pipes, and storm drain inlets within the project site would be removed. New eight-inch water lines would be installed, connecting to the City's existing water main located in Tara Hills Drive. In addition, new sanitary sewer cleanouts and grease interceptors would be provided on-site.

Electricity for the project site would continue to be provided by PG&E. Existing overhead electrical and telephone lines within the project site, as well as existing power poles, would be relocated to accommodate the proposed site layout. Per Section 17.50.030 of the City's Municipal Code, all on-site utilities that would have the capacity to serve the proposed project would be installed underground. At the City's discretion, the project may not be required to include undergrounding of the existing electrical equipment within the western portion of the site, provided that the proposed project does not draw any electricity from such facilities.

The proposed redevelopment project would result in a net increase of approximately 11,956 sf relative to the 93,193 sf of existing on-site commercial uses. Given the relatively minor increase in square footage that would occur as a result of the proposed project, the project would not substantially increase water demand or wastewater generation relative to the existing on-site development.

Figure 32
Utility Plan (North)

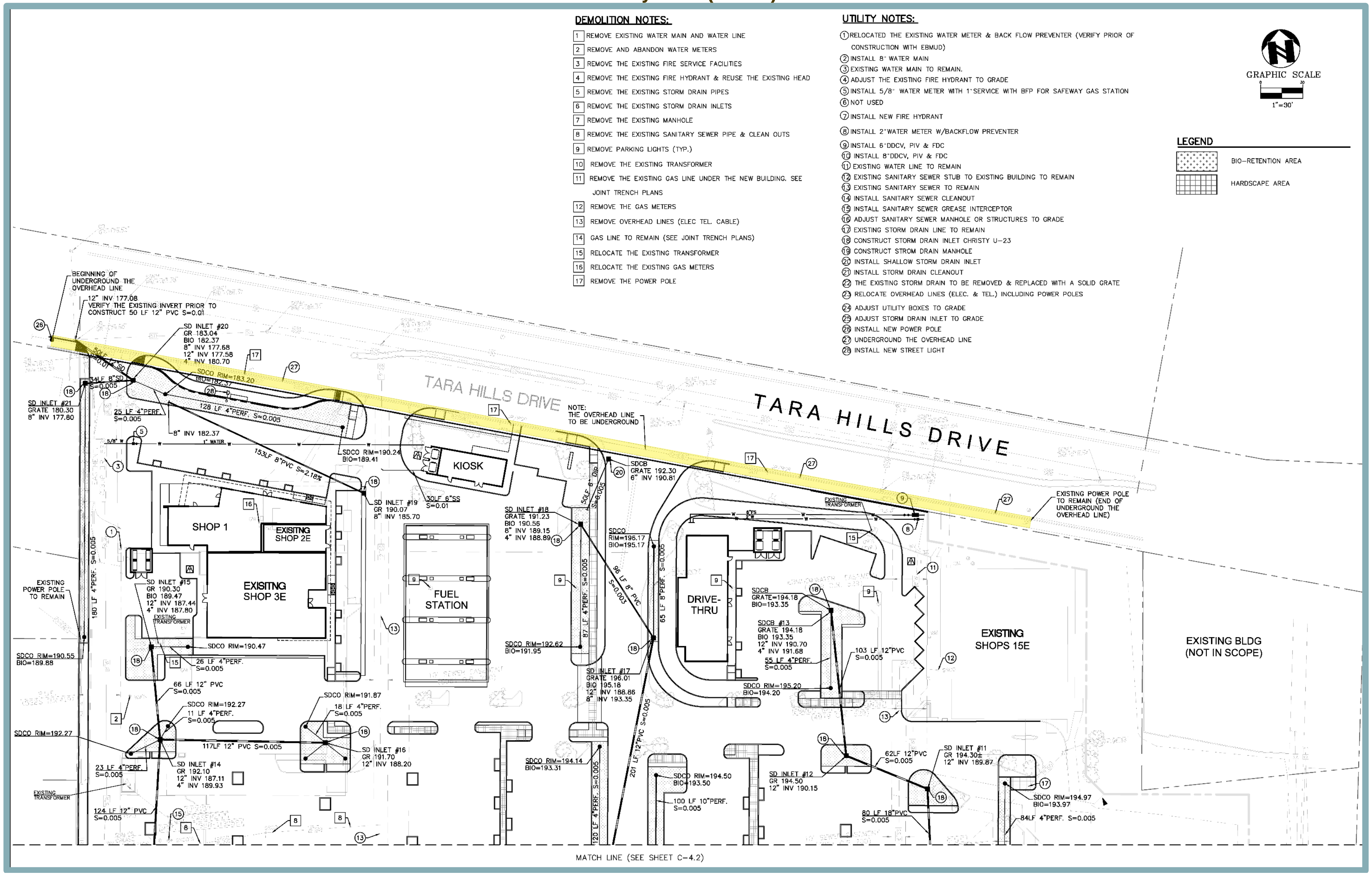
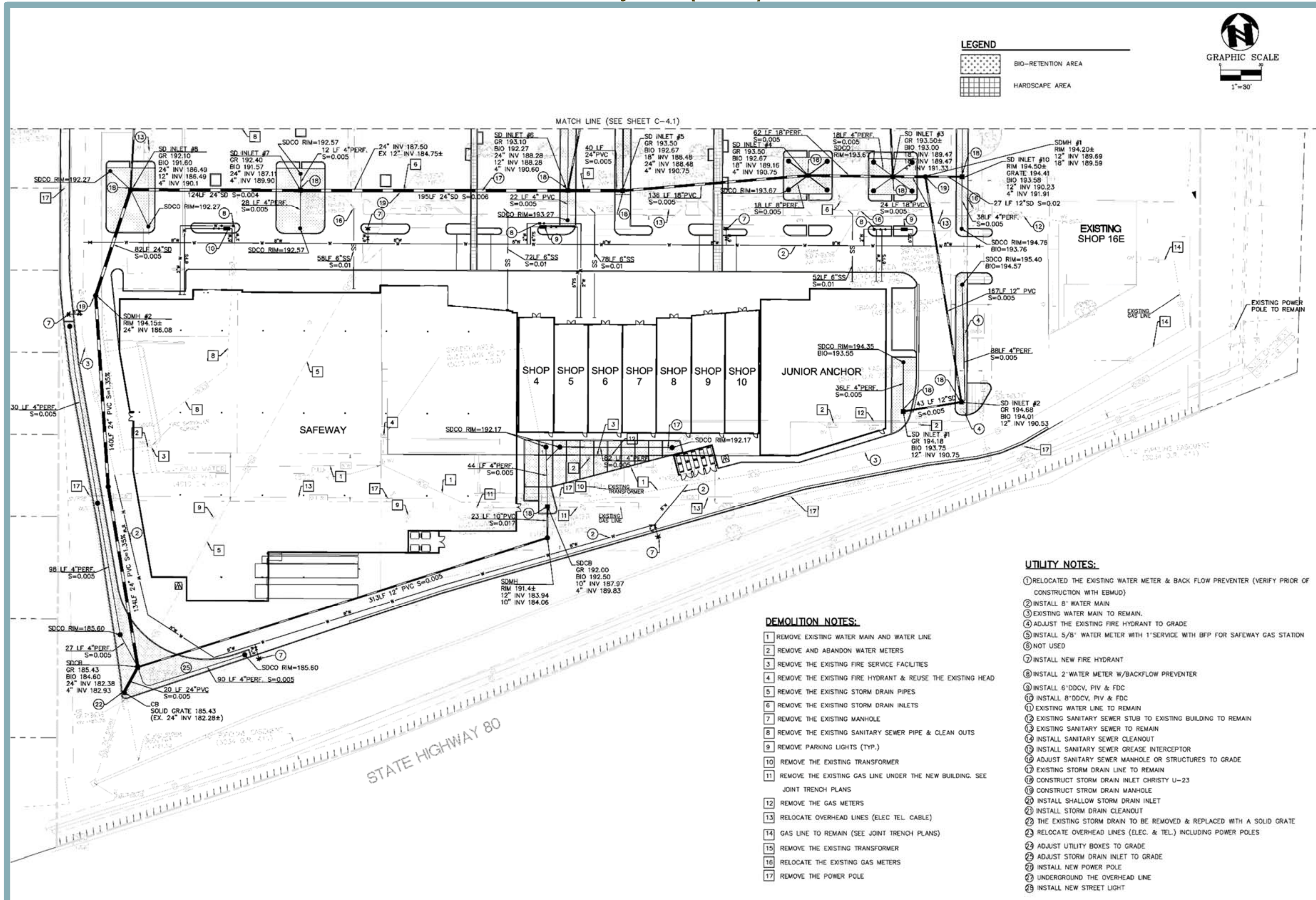


Figure 33
Utility Plan (South)



Wastewater from the proposed project would be treated at the Pinole/Hercules Water Pollution Control Plant (WPCP). The City's General Plan EIR estimates the 2030 wastewater flow amount to the Pinole/Hercules WPCP will be 3.93 million gallons per day (mgd), which is below the WPCP's total capacity of 4.06 mgd.[53] Thus, sufficient wastewater treatment capacity would be available to accommodate the proposed project.

As discussed in Section X, Hydrology and Water Quality, of this IS/MND, the proposed bio-retention facilities would be sized to adequately manage runoff from all impervious surfaces within the project site prior to discharge of runoff to the City's storm drain system.

In addition, given that the proposed project is consistent with the intensity of development that has been anticipated for the project site per the site's current General Plan/Specific Plan land use and zoning designations, the utility infrastructure within the project vicinity has been designed with adequate capacity to accommodate demand from development of the project site, as well as other existing and planned uses in the project area. Therefore, the project would result in a ***less-than-significant*** impact related to the relocation or construction of new or expanded water, wastewater treatment, or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects.

b. As noted previously, water supplies for the City are provided by the EBMUD. Based on predictions within the EBMUD 2015 UWMP, the EBMUD is projected to have sufficient water supplies to meet projected water needs through 2040 during normal water years, as well as first and second consecutive drought years.[54] During multiple dry years, the need for EBMUD to develop supplemental supplies to meet customer demand exists. Rationing in the first and second drought years allow the city to meet supply needs. The water demand projections presented in the 2015 UWMP are based on existing and future development anticipated to occur within the EBMUD service area, including ongoing demands associated with operation of commercial uses on the project site.

Given that the proposed project is consistent with the intensity of development that has been anticipated for the project site per the City's General Plan/Specific Plan land use designation for the site, water demand associated with the project has been planned for by the City and accounted for in regional projections, including the 2015 UWMP. The project would not substantially increase water demand relative to the existing on-site commercial uses. In addition, the proposed project would be subject to any rationing measures implemented by EBMUD during dry years. Thus, while EBMUD anticipates potential supply shortfalls in the third consecutive dry year after 2025, the proposed project would not result in a substantial increase in the anticipated supply shortfall, as demand from the project site has been generally anticipated. Considering the above, the project would not have a substantial effect related to the provision of sufficient water supplies to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years, and a ***less-than-significant*** impact would occur.

d,e. Republic Services provides solid waste collection, disposal, recycling, and yard waste services to the City of Pinole, including the project site. Solid waste and recyclables from the City are taken to the Contra Costa Transfer and Recovery Station in Martinez. Solid

53 City of Pinole. *General Plan Update Draft Environmental Impact Report, SCH #2009022057* [pg. 4.12-62]. July 2010.
54 East Bay Municipal Utility District. *Urban Water Management Plan* [pg. 4.3-57]. July, 2015.

waste is transferred from the Transfer and Recovery Station to the Keller Canyon Landfill in Pittsburg. The Keller Canyon Landfill site is 1,399 acres, 244 of which comprise the actual current disposal acreage. The site currently handles 2,500 tons of waste per day, although the permit for the site allows up to 3,500 tons of waste per day to be managed at the facility. According to the California Department of Resources Recycling and Recovery (CalRecycle), the Keller Canyon Landfill has a remaining capacity of 63,408,410 cubic yards out of a total permitted capacity of 75,018,280, or 85 percent remaining capacity.[55]

Because the proposed project is consistent with the project site's current General Plan land use and zoning designations, construction and operation of the proposed project would not result in increased solid waste generation beyond what has been previously anticipated for the site by the City and analyzed in the General Plan EIR.[56] In addition, the project would be required to comply with all applicable provisions of Chapter 8.08, Solid Waste, of the City's Municipal Code. Therefore, the proposed project would not generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals and would comply with federal, State, and local management and reduction statutes and regulations related to solid waste. Thus, a ***less-than-significant*** impact related to solid waste would occur as a result of the proposed project.

55 California Department of Resources Recycling and Recovery (CalRecycle). *Facility/Site Summary Details: Keller Canyon Landfill (07-AA-0032)*. Available at: https://www2.calrecycle.ca.gov/swfacilities/Directory/07-AA-0032/. Accessed September 2019.

56 City of Pinole. *General Plan Update Draft Environmental Impact Report, SCH #2009022057.* July 2010.

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

Discussion

a-d. According to the CAL FIRE Fire and Resource Assessment Program, the project site is not located in or near a State Responsibility Area and is not classified as Very High Fire Hazard Severity Zone.[57] The nearest Very High Fire Hazard Severity Zone is located approximately 0.28-mile south of the site, across I-80. Therefore, the proposed project would not be subject to substantial risks related to wildfires and a ***less-than-significant*** impact would occur.

57 California Department of Forestry and Fire Protection. *Contra Costa County Fire Hazard Severity Zones in SRA.* November 7, 2007.

XXI. MANDATORY FINDINGS OF SIGNIFICANCE.	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	✖	☐
b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	✖	☐
c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	✖	☐

Discussion

a. As discussed in Section IV, Biological Resources, of this Initial Study, while a limited potential exists for white-tailed kite, other nesting migratory birds, and roosting bats to occur on-site, Mitigation Measures IV-1 and IV-2 would ensure that any impacts related to special-status species would be reduced to less-than-significant levels. In addition, while the project site contains protected trees that would need to be removed, Mitigation Measure IV-3 would ensure that associated impacts would be reduced to less-than-significant levels. The project site is currently developed with a shopping center and does not contain any known historic or prehistoric resources. Thus, implementation of the proposed project is not anticipated to have the potential to result in impacts related to historic or prehistoric resources. Nevertheless, Mitigation Measures V-1 and V-2 would ensure that in the event that historic or prehistoric resources are discovered within the project site during construction activities, such resources are protected in compliance with the requirements of CEQA.

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

b. The proposed project in conjunction with other development within the City of Pinole could incrementally contribute to cumulative impacts in the area. However, as demonstrated in this IS/MND, all potential environmental impacts that could occur as a result of project implementation would be reduced to a less-than-significant level through compliance with the mitigation measures included in this IS/MND, as well as applicable General Plan/Specific Plan policies, Municipal Code standards, and other applicable local and State regulations. In addition, the project would be consistent with the type and intensity of development that has been anticipated for the site per the site's current Specific Plan land use and zoning designations. Therefore, when viewed in conjunction with other closely related past, present, or reasonably foreseeable future projects, development of the proposed project would not result in a cumulatively considerable contribution to cumulative impacts in the City of Pinole, and the project's incremental contribution to cumulative impacts would be ***less than significant.***

c. As described in this IS/MND, the proposed project would comply with all applicable General Plan/Specific Plan policies, Municipal Code standards, other applicable local and State regulations, and mitigation measures included herein. In addition, as discussed in the Air Quality, Geology and Soils, Hazards and Hazardous Materials, Greenhouse Gas Emissions, and Noise sections of this IS/MND, the proposed project would not cause substantial effects to human beings, which cannot be mitigated to less-than-significant levels, including effects related to exposure to air pollutants, geologic hazards, GHG emissions, hazardous materials, and excessive noise. Therefore, the proposed project's impact would be ***less than significant***.

APPENDIX A

AIR QUALITY AND GREENHOUSE GAS MODELING RESULTS

Pinole Square Project
CalEEMod Results
Existing Development

Pinole Square (Existing)

Bay Area AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	454.00	Space	4.09	181,600.00	0
Regional Shopping Center	81.34	1000sqft	7.80	81,339.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	269.5	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Intensity factor for CO2 adjusted based on PG&E’s RPS reductions

Land Use - Applicant provided

Construction Phase - Construction not modeled

Off-road Equipment - Construction not modeled

Trips and VMT - Construction not modeled

On-road Fugitive Dust - Construction not modeled

Vehicle Trips - Per Transportation Impact Study

Table Name	Column Name	Default Value	New Value
tblLandUse	LotAcreage	1.87	7.80
tblProjectCharacteristics	CO2IntensityFactor	641.35	269.5
tblVehicleTrips	ST_TR	49.97	65.03
tblVehicleTrips	SU_TR	25.24	65.03
tblVehicleTrips	WD_TR	42.70	65.03

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.0336	0.3324	0.2212	4.0000e-004	1.1900e-003	0.0166	0.0178	3.2000e-004	0.0154	0.0157	0.0000	35.0370	35.0370	9.6200e-003	0.0000	35.2776
Maximum	**0.0336**	**0.3324**	**0.2212**	**4.0000e-004**	**1.1900e-003**	**0.0166**	**0.0178**	**3.2000e-004**	**0.0154**	**0.0157**	**0.0000**	**35.0370**	**35.0370**	**9.6200e-003**	**0.0000**	**35.2776**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.0336	0.3324	0.2212	4.0000e-004	1.1900e-003	0.0166	0.0178	3.2000e-004	0.0154	0.0157	0.0000	35.0370	35.0370	9.6200e-003	0.0000	35.2776
Maximum	**0.0336**	**0.3324**	**0.2212**	**4.0000e-004**	**1.1900e-003**	**0.0166**	**0.0178**	**3.2000e-004**	**0.0154**	**0.0157**	**0.0000**	**35.0370**	**35.0370**	**9.6200e-003**	**0.0000**	**35.2776**

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

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**2-3-2020**	**5-2-2020**	0.3399	0.3399
		Highest	0.3399	0.3399

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3761	4.0000e-005	4.9300e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	9.5700e-003	9.5700e-003	3.0000e-005	0.0000	0.0102
Energy	2.0200e-003	0.0183	0.0154	1.1000e-004		1.3900e-003	1.3900e-003		1.3900e-003	1.3900e-003	0.0000	131.9404	131.9404	0.0124	2.8600e-003	133.1032
Mobile	1.2002	5.6376	12.1508	0.0409	3.4516	0.0376	3.4892	0.9264	0.0352	0.9616	0.0000	3,752.4524	3,752.4524	0.1482	0.0000	3,756.1584
Waste						0.0000	0.0000		0.0000	0.0000	17.3375	0.0000	17.3375	1.0246	0.0000	42.9528
Water						0.0000	0.0000		0.0000	0.0000	1.9115	5.5653	7.4768	0.1969	4.7600e-003	13.8183
Total	**1.5782**	**5.6559**	**12.1712**	**0.0410**	**3.4516**	**0.0390**	**3.4906**	**0.9264**	**0.0366**	**0.9630**	**19.2489**	**3,889.9676**	**3,909.2166**	**1.3822**	**7.6200e-003**	**3,946.0429**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3761	4.0000e-005	4.9300e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	9.5700e-003	9.5700e-003	3.0000e-005	0.0000	0.0102
Energy	2.0200e-003	0.0183	0.0154	1.1000e-004		1.3900e-003	1.3900e-003		1.3900e-003	1.3900e-003	0.0000	131.9404	131.9404	0.0124	2.8600e-003	133.1032
Mobile	1.2002	5.6376	12.1508	0.0409	3.4516	0.0376	3.4892	0.9264	0.0352	0.9616	0.0000	3,752.4524	3,752.4524	0.1482	0.0000	3,756.1584
Waste						0.0000	0.0000		0.0000	0.0000	17.3375	0.0000	17.3375	1.0246	0.0000	42.9528
Water						0.0000	0.0000		0.0000	0.0000	1.9115	5.5653	7.4768	0.1969	4.7600e-003	13.8183
Total	**1.5782**	**5.6559**	**12.1712**	**0.0410**	**3.4516**	**0.0390**	**3.4906**	**0.9264**	**0.0366**	**0.9630**	**19.2489**	**3,889.9676**	**3,909.2166**	**1.3822**	**7.6200e-003**	**3,946.0429**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	2/3/2020	2/28/2020	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 4.09

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0331	0.3320	0.2175	3.9000e-004		0.0166	0.0166		0.0154	0.0154	0.0000	33.9986	33.9986	9.6000e-003	0.0000	34.2386
Total	**0.0331**	**0.3320**	**0.2175**	**3.9000e-004**		**0.0166**	**0.0166**		**0.0154**	**0.0154**	**0.0000**	**33.9986**	**33.9986**	**9.6000e-003**	**0.0000**	**34.2386**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-004	3.6000e-004	3.6800e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.1900e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	1.0384	1.0384	3.0000e-005	0.0000	1.0391
Total	**5.0000e-004**	**3.6000e-004**	**3.6800e-003**	**1.0000e-005**	**1.1900e-003**	**1.0000e-005**	**1.1900e-003**	**3.2000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**1.0384**	**1.0384**	**3.0000e-005**	**0.0000**	**1.0391**

3.2 Demolition - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0331	0.3320	0.2175	3.9000e-004		0.0166	0.0166		0.0154	0.0154	0.0000	33.9986	33.9986	9.6000e-003	0.0000	34.2385
Total	**0.0331**	**0.3320**	**0.2175**	**3.9000e-004**		**0.0166**	**0.0166**		**0.0154**	**0.0154**	**0.0000**	**33.9986**	**33.9986**	**9.6000e-003**	**0.0000**	**34.2385**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-004	3.6000e-004	3.6800e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.1900e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	1.0384	1.0384	3.0000e-005	0.0000	1.0391
Total	**5.0000e-004**	**3.6000e-004**	**3.6800e-003**	**1.0000e-005**	**1.1900e-003**	**1.0000e-005**	**1.1900e-003**	**3.2000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**1.0384**	**1.0384**	**3.0000e-005**	**0.0000**	**1.0391**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.2002	5.6376	12.1508	0.0409	3.4516	0.0376	3.4892	0.9264	0.0352	0.9616	0.0000	3,752.4524	3,752.4524	0.1482	0.0000	3,756.1584
Unmitigated	1.2002	5.6376	12.1508	0.0409	3.4516	0.0376	3.4892	0.9264	0.0352	0.9616	0.0000	3,752.4524	3,752.4524	0.1482	0.0000	3,756.1584

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Parking Lot	0.00	0.00	0.00		
Regional Shopping Center	5,289.48	5,289.48	5289.48	9,274,062	9,274,062
Total	5,289.48	5,289.48	5,289.48	9,274,062	9,274,062

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Parking Lot	0.576985	0.039376	0.193723	0.112069	0.016317	0.005358	0.017943	0.025814	0.002614	0.002274	0.005874	0.000887	0.000768
Regional Shopping Center	0.576985	0.039376	0.193723	0.112069	0.016317	0.005358	0.017943	0.025814	0.002614	0.002274	0.005874	0.000887	0.000768

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	111.9738	111.9738	0.0121	2.4900e-003	113.0180
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	111.9738	111.9738	0.0121	2.4900e-003	113.0180
NaturalGas Mitigated	2.0200e-003	0.0183	0.0154	1.1000e-004		1.3900e-003	1.3900e-003		1.3900e-003	1.3900e-003	0.0000	19.9666	19.9666	3.8000e-004	3.7000e-004	20.0852
NaturalGas Unmitigated	2.0200e-003	0.0183	0.0154	1.1000e-004		1.3900e-003	1.3900e-003		1.3900e-003	1.3900e-003	0.0000	19.9666	19.9666	3.8000e-004	3.7000e-004	20.0852

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	374159	2.0200e-003	0.0183	0.0154	1.1000e-004		1.3900e-003	1.3900e-003		1.3900e-003	1.3900e-003	0.0000	19.9666	19.9666	3.8000e-004	3.7000e-004	20.0852
Total		**2.0200e-003**	**0.0183**	**0.0154**	**1.1000e-004**		**1.3900e-003**	**1.3900e-003**		**1.3900e-003**	**1.3900e-003**	**0.0000**	**19.9666**	**19.9666**	**3.8000e-004**	**3.7000e-004**	**20.0852**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	374159	2.0200e-003	0.0183	0.0154	1.1000e-004		1.3900e-003	1.3900e-003		1.3900e-003	1.3900e-003	0.0000	19.9666	19.9666	3.8000e-004	3.7000e-004	20.0852
Total		**2.0200e-003**	**0.0183**	**0.0154**	**1.1000e-004**		**1.3900e-003**	**1.3900e-003**		**1.3900e-003**	**1.3900e-003**	**0.0000**	**19.9666**	**19.9666**	**3.8000e-004**	**3.7000e-004**	**20.0852**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Parking Lot	63560	7.7698	8.4000e-004	1.7000e-004	7.8422
Regional Shopping Center	852433	104.2041	0.0112	2.3200e-003	105.1757
Total		**111.9738**	**0.0121**	**2.4900e-003**	**113.0179**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Parking Lot	63560	7.7698	8.4000e-004	1.7000e-004	7.8422
Regional Shopping Center	852433	104.2041	0.0112	2.3200e-003	105.1757
Total		**111.9738**	**0.0121**	**2.4900e-003**	**113.0179**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.3761	4.0000e-005	4.9300e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	9.5700e-003	9.5700e-003	3.0000e-005	0.0000	0.0102
Unmitigated	0.3761	4.0000e-005	4.9300e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	9.5700e-003	9.5700e-003	3.0000e-005	0.0000	0.0102

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0462					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3294					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	4.6000e-004	4.0000e-005	4.9300e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	9.5700e-003	9.5700e-003	3.0000e-005	0.0000	0.0102
Total	**0.3761**	**4.0000e-005**	**4.9300e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**9.5700e-003**	**9.5700e-003**	**3.0000e-005**	**0.0000**	**0.0102**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0462					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3294					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	4.6000e-004	4.0000e-005	4.9300e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	9.5700e-003	9.5700e-003	3.0000e-005	0.0000	0.0102
Total	**0.3761**	**4.0000e-005**	**4.9300e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**9.5700e-003**	**9.5700e-003**	**3.0000e-005**	**0.0000**	**0.0102**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	7.4768	0.1969	4.7600e-003	13.8183
Unmitigated	7.4768	0.1969	4.7600e-003	13.8183

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	6.02506 / 3.69278	7.4768	0.1969	4.7600e-003	13.8183
Total		**7.4768**	**0.1969**	**4.7600e-003**	**13.8183**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	6.02506 / 3.69278	7.4768	0.1969	4.7600e-003	13.8183
Total		**7.4768**	**0.1969**	**4.7600e-003**	**13.8183**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	17.3375	1.0246	0.0000	42.9528
Unmitigated	17.3375	1.0246	0.0000	42.9528

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	85.41	17.3375	1.0246	0.0000	42.9528
Total		**17.3375**	**1.0246**	**0.0000**	**42.9528**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	85.41	17.3375	1.0246	0.0000	42.9528
Total		**17.3375**	**1.0246**	**0.0000**	**42.9528**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Pinole Square (Existing)

Bay Area AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	454.00	Space	4.09	181,600.00	0
Regional Shopping Center	81.34	1000sqft	7.80	81,339.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 64

Climate Zone 5 **Operational Year** 2022

Utility Company Pacific Gas & Electric Company

CO2 Intensity (lb/MWhr) 269.5 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Intensity factor for CO2 adjusted based on PG&E’s RPS reductions

Land Use - Applicant provided

Construction Phase - Construction not modeled

Off-road Equipment - Construction not modeled

Trips and VMT - Construction not modeled

On-road Fugitive Dust - Construction not modeled

Vehicle Trips - Per Transportation Impact Study

Table Name	Column Name	Default Value	New Value
tblLandUse	LotAcreage	1.87	7.80
tblProjectCharacteristics	CO2IntensityFactor	641.35	269.5
tblVehicleTrips	ST_TR	49.97	65.03
tblVehicleTrips	SU_TR	25.24	65.03
tblVehicleTrips	WD_TR	42.70	65.03

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	3.3643	33.2326	22.1557	0.0401	0.1232	1.6595	1.7827	0.0327	1.5426	1.5753	0.0000	3,870.8214	3,870.8214	1.0609	0.0000	3,897.3443
Maximum	**3.3643**	**33.2326**	**22.1557**	**0.0401**	**0.1232**	**1.6595**	**1.7827**	**0.0327**	**1.5426**	**1.5753**	**0.0000**	**3,870.8214**	**3,870.8214**	**1.0609**	**0.0000**	**3,897.3443**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	3.3643	33.2326	22.1557	0.0401	0.1232	1.6595	1.7827	0.0327	1.5426	1.5753	0.0000	3,870.8214	3,870.8214	1.0609	0.0000	3,897.3443
Maximum	**3.3643**	**33.2326**	**22.1557**	**0.0401**	**0.1232**	**1.6595**	**1.7827**	**0.0327**	**1.5426**	**1.5753**	**0.0000**	**3,870.8214**	**3,870.8214**	**1.0609**	**0.0000**	**3,897.3443**

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

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.0632	5.0000e-004	0.0547	0.0000		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004		0.1172	0.1172	3.1000e-004		0.1249
Energy	0.0111	0.1005	0.0844	6.0000e-004		7.6400e-003	7.6400e-003		7.6400e-003	7.6400e-003		120.5993	120.5993	2.3100e-003	2.2100e-003	121.3160
Mobile	7.6321	30.1850	68.1029	0.2375	19.7030	0.2060	19.9089	5.2715	0.1928	5.4642		24,037.2912	24,037.2912	0.8949		24,059.6626
Total	**9.7064**	**30.2860**	**68.2421**	**0.2381**	**19.7030**	**0.2138**	**19.9168**	**5.2715**	**0.2006**	**5.4721**		**24,158.0077**	**24,158.0077**	**0.8975**	**2.2100e-003**	**24,181.1035**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.0632	5.0000e-004	0.0547	0.0000		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004		0.1172	0.1172	3.1000e-004		0.1249
Energy	0.0111	0.1005	0.0844	6.0000e-004		7.6400e-003	7.6400e-003		7.6400e-003	7.6400e-003		120.5993	120.5993	2.3100e-003	2.2100e-003	121.3160
Mobile	7.6321	30.1850	68.1029	0.2375	19.7030	0.2060	19.9089	5.2715	0.1928	5.4642		24,037.2912	24,037.2912	0.8949		24,059.6626
Total	**9.7064**	**30.2860**	**68.2421**	**0.2381**	**19.7030**	**0.2138**	**19.9168**	**5.2715**	**0.2006**	**5.4721**		**24,158.0077**	**24,158.0077**	**0.8975**	**2.2100e-003**	**24,181.1035**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	2/3/2020	2/28/2020	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 4.09

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419		3,747.7049	3,747.7049	1.0580		3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**		**1.6587**	**1.6587**		**1.5419**	**1.5419**		**3,747.7049**	**3,747.7049**	**1.0580**		**3,774.1536**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0521	0.0316	0.4025	1.2400e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		123.1165	123.1165	2.9700e-003		123.1907
Total	**0.0521**	**0.0316**	**0.4025**	**1.2400e-003**	**0.1232**	**8.0000e-004**	**0.1240**	**0.0327**	**7.4000e-004**	**0.0334**		**123.1165**	**123.1165**	**2.9700e-003**		**123.1907**

3.2 Demolition - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419	0.0000	3,747.704 9	3,747.704 9	1.0580		3,774.153 6
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**		**1.6587**	**1.6587**		**1.5419**	**1.5419**	**0.0000**	**3,747.704 9**	**3,747.704 9**	**1.0580**		**3,774.153 6**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0521	0.0316	0.4025	1.2400e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		123.1165	123.1165	2.9700e-003		123.1907
Total	**0.0521**	**0.0316**	**0.4025**	**1.2400e-003**	**0.1232**	**8.0000e-004**	**0.1240**	**0.0327**	**7.4000e-004**	**0.0334**		**123.1165**	**123.1165**	**2.9700e-003**		**123.1907**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	7.6321	30.1850	68.1029	0.2375	19.7030	0.2060	19.9089	5.2715	0.1928	5.4642		24,037.2912	24,037.2912	0.8949		24,059.6626
Unmitigated	7.6321	30.1850	68.1029	0.2375	19.7030	0.2060	19.9089	5.2715	0.1928	5.4642		24,037.2912	24,037.2912	0.8949		24,059.6626

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Parking Lot	0.00	0.00	0.00		
Regional Shopping Center	5,289.48	5,289.48	5289.48	9,274,062	9,274,062
Total	5,289.48	5,289.48	5,289.48	9,274,062	9,274,062

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Parking Lot	0.576985	0.039376	0.193723	0.112069	0.016317	0.005358	0.017943	0.025814	0.002614	0.002274	0.005874	0.000887	0.000768
Regional Shopping Center	0.576985	0.039376	0.193723	0.112069	0.016317	0.005358	0.017943	0.025814	0.002614	0.002274	0.005874	0.000887	0.000768

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0111	0.1005	0.0844	6.0000e-004		7.6400e-003	7.6400e-003		7.6400e-003	7.6400e-003		120.5993	120.5993	2.3100e-003	2.2100e-003	121.3160
NaturalGas Unmitigated	0.0111	0.1005	0.0844	6.0000e-004		7.6400e-003	7.6400e-003		7.6400e-003	7.6400e-003		120.5993	120.5993	2.3100e-003	2.2100e-003	121.3160

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	1025.09	0.0111	0.1005	0.0844	6.0000e-004		7.6400e-003	7.6400e-003		7.6400e-003	7.6400e-003		120.5993	120.5993	2.3100e-003	2.2100e-003	121.3160
Total		**0.0111**	**0.1005**	**0.0844**	**6.0000e-004**		**7.6400e-003**	**7.6400e-003**		**7.6400e-003**	**7.6400e-003**		**120.5993**	**120.5993**	**2.3100e-003**	**2.2100e-003**	**121.3160**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	1.02509	0.0111	0.1005	0.0844	6.0000e-004		7.6400e-003	7.6400e-003		7.6400e-003	7.6400e-003		120.5993	120.5993	2.3100e-003	2.2100e-003	121.3160
Total		**0.0111**	**0.1005**	**0.0844**	**6.0000e-004**		**7.6400e-003**	**7.6400e-003**		**7.6400e-003**	**7.6400e-003**		**120.5993**	**120.5993**	**2.3100e-003**	**2.2100e-003**	**121.3160**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	2.0632	5.0000e-004	0.0547	0.0000		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004		0.1172	0.1172	3.1000e-004		0.1249
Unmitigated	2.0632	5.0000e-004	0.0547	0.0000		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004		0.1172	0.1172	3.1000e-004		0.1249

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.2532					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.8050					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.0900e-003	5.0000e-004	0.0547	0.0000		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004		0.1172	0.1172	3.1000e-004		0.1249
Total	**2.0632**	**5.0000e-004**	**0.0547**	**0.0000**		**2.0000e-004**	**2.0000e-004**		**2.0000e-004**	**2.0000e-004**		**0.1172**	**0.1172**	**3.1000e-004**		**0.1249**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.2532					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.8050					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.0900e-003	5.0000e-004	0.0547	0.0000		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004		0.1172	0.1172	3.1000e-004		0.1249
Total	**2.0632**	**5.0000e-004**	**0.0547**	**0.0000**		**2.0000e-004**	**2.0000e-004**		**2.0000e-004**	**2.0000e-004**		**0.1172**	**0.1172**	**3.1000e-004**		**0.1249**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Pinole Square (Existing)

Bay Area AQMD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	454.00	Space	4.09	181,600.00	0
Regional Shopping Center	81.34	1000sqft	7.80	81,339.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	269.5	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Intensity factor for CO2 adjusted based on PG&E’s RPS reductions

Land Use - Applicant provided

Construction Phase - Construction not modeled

Off-road Equipment - Construction not modeled

Trips and VMT - Construction not modeled

On-road Fugitive Dust - Construction not modeled

Vehicle Trips - Per Transportation Impact Study

Table Name	Column Name	Default Value	New Value
tblLandUse	LotAcreage	1.87	7.80
tblProjectCharacteristics	CO2IntensityFactor	641.35	269.5
tblVehicleTrips	ST_TR	49.97	65.03
tblVehicleTrips	SU_TR	25.24	65.03
tblVehicleTrips	WD_TR	42.70	65.03

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	3.3673	33.2400	22.1312	0.0400	0.1232	1.6595	1.7827	0.0327	1.5426	1.5753	0.0000	3,861.1147	3,861.1147	1.0607	0.0000	3,887.6328
Maximum	**3.3673**	**33.2400**	**22.1312**	**0.0400**	**0.1232**	**1.6595**	**1.7827**	**0.0327**	**1.5426**	**1.5753**	**0.0000**	**3,861.1147**	**3,861.1147**	**1.0607**	**0.0000**	**3,887.6328**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	3.3673	33.2400	22.1312	0.0400	0.1232	1.6595	1.7827	0.0327	1.5426	1.5753	0.0000	3,861.1147	3,861.1147	1.0607	0.0000	3,887.6328
Maximum	**3.3673**	**33.2400**	**22.1312**	**0.0400**	**0.1232**	**1.6595**	**1.7827**	**0.0327**	**1.5426**	**1.5753**	**0.0000**	**3,861.1147**	**3,861.1147**	**1.0607**	**0.0000**	**3,887.6328**

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

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.0632	5.0000e-004	0.0547	0.0000		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004		0.1172	0.1172	3.1000e-004		0.1249
Energy	0.0111	0.1005	0.0844	6.0000e-004		7.6400e-003	7.6400e-003		7.6400e-003	7.6400e-003		120.5993	120.5993	2.3100e-003	2.2100e-003	121.3160
Mobile	6.5317	31.4178	70.5967	0.2223	19.7030	0.2079	19.9109	5.2715	0.1946	5.4661		22,491.0799	22,491.0799	0.9271		22,514.2569
Total	**8.6060**	**31.5188**	**70.7358**	**0.2229**	**19.7030**	**0.2158**	**19.9187**	**5.2715**	**0.2025**	**5.4739**		**22,611.7963**	**22,611.7963**	**0.9297**	**2.2100e-003**	**22,635.6978**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.0632	5.0000e-004	0.0547	0.0000		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004		0.1172	0.1172	3.1000e-004		0.1249
Energy	0.0111	0.1005	0.0844	6.0000e-004		7.6400e-003	7.6400e-003		7.6400e-003	7.6400e-003		120.5993	120.5993	2.3100e-003	2.2100e-003	121.3160
Mobile	6.5317	31.4178	70.5967	0.2223	19.7030	0.2079	19.9109	5.2715	0.1946	5.4661		22,491.0799	22,491.0799	0.9271		22,514.2569
Total	**8.6060**	**31.5188**	**70.7358**	**0.2229**	**19.7030**	**0.2158**	**19.9187**	**5.2715**	**0.2025**	**5.4739**		**22,611.7963**	**22,611.7963**	**0.9297**	**2.2100e-003**	**22,635.6978**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	2/3/2020	2/28/2020	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 4.09

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419		3,747.7049	3,747.7049	1.0580		3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**		**1.6587**	**1.6587**		**1.5419**	**1.5419**		**3,747.7049**	**3,747.7049**	**1.0580**		**3,774.1536**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0552	0.0390	0.3780	1.1400e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		113.4098	113.4098	2.7700e-003		113.4792
Total	**0.0552**	**0.0390**	**0.3780**	**1.1400e-003**	**0.1232**	**8.0000e-004**	**0.1240**	**0.0327**	**7.4000e-004**	**0.0334**		**113.4098**	**113.4098**	**2.7700e-003**		**113.4792**

3.2 Demolition - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419	0.0000	3,747.7049	3,747.7049	1.0580		3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**		**1.6587**	**1.6587**		**1.5419**	**1.5419**	**0.0000**	**3,747.7049**	**3,747.7049**	**1.0580**		**3,774.1536**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0552	0.0390	0.3780	1.1400e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		113.4098	113.4098	2.7700e-003		113.4792
Total	**0.0552**	**0.0390**	**0.3780**	**1.1400e-003**	**0.1232**	**8.0000e-004**	**0.1240**	**0.0327**	**7.4000e-004**	**0.0334**		**113.4098**	**113.4098**	**2.7700e-003**		**113.4792**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	6.5317	31.4178	70.5967	0.2223	19.7030	0.2079	19.9109	5.2715	0.1946	5.4661		22,491.0799	22,491.0799	0.9271		22,514.2569
Unmitigated	6.5317	31.4178	70.5967	0.2223	19.7030	0.2079	19.9109	5.2715	0.1946	5.4661		22,491.0799	22,491.0799	0.9271		22,514.2569

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Parking Lot	0.00	0.00	0.00		
Regional Shopping Center	5,289.48	5,289.48	5289.48	9,274,062	9,274,062
Total	5,289.48	5,289.48	5,289.48	9,274,062	9,274,062

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Parking Lot	0.576985	0.039376	0.193723	0.112069	0.016317	0.005358	0.017943	0.025814	0.002614	0.002274	0.005874	0.000887	0.000768
Regional Shopping Center	0.576985	0.039376	0.193723	0.112069	0.016317	0.005358	0.017943	0.025814	0.002614	0.002274	0.005874	0.000887	0.000768

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0111	0.1005	0.0844	6.0000e-004		7.6400e-003	7.6400e-003		7.6400e-003	7.6400e-003		120.5993	120.5993	2.3100e-003	2.2100e-003	121.3160
NaturalGas Unmitigated	0.0111	0.1005	0.0844	6.0000e-004		7.6400e-003	7.6400e-003		7.6400e-003	7.6400e-003		120.5993	120.5993	2.3100e-003	2.2100e-003	121.3160

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	1025.09	0.0111	0.1005	0.0844	6.0000e-004		7.6400e-003	7.6400e-003		7.6400e-003	7.6400e-003		120.5993	120.5993	2.3100e-003	2.2100e-003	121.3160
Total		**0.0111**	**0.1005**	**0.0844**	**6.0000e-004**		**7.6400e-003**	**7.6400e-003**		**7.6400e-003**	**7.6400e-003**		**120.5993**	**120.5993**	**2.3100e-003**	**2.2100e-003**	**121.3160**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	1.02509	0.0111	0.1005	0.0844	6.0000e-004		7.6400e-003	7.6400e-003		7.6400e-003	7.6400e-003		120.5993	120.5993	2.3100e-003	2.2100e-003	121.3160
Total		**0.0111**	**0.1005**	**0.0844**	**6.0000e-004**		**7.6400e-003**	**7.6400e-003**		**7.6400e-003**	**7.6400e-003**		**120.5993**	**120.5993**	**2.3100e-003**	**2.2100e-003**	**121.3160**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	2.0632	5.0000e-004	0.0547	0.0000		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004		0.1172	0.1172	3.1000e-004		0.1249
Unmitigated	2.0632	5.0000e-004	0.0547	0.0000		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004		0.1172	0.1172	3.1000e-004		0.1249

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.2532					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.8050					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.0900e-003	5.0000e-004	0.0547	0.0000		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004		0.1172	0.1172	3.1000e-004		0.1249
Total	**2.0632**	**5.0000e-004**	**0.0547**	**0.0000**		**2.0000e-004**	**2.0000e-004**		**2.0000e-004**	**2.0000e-004**		**0.1172**	**0.1172**	**3.1000e-004**		**0.1249**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.2532					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.8050					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.0900e-003	5.0000e-004	0.0547	0.0000		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004		0.1172	0.1172	3.1000e-004		0.1249
Total	**2.0632**	**5.0000e-004**	**0.0547**	**0.0000**		**2.0000e-004**	**2.0000e-004**		**2.0000e-004**	**2.0000e-004**		**0.1172**	**0.1172**	**3.1000e-004**		**0.1249**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Pinole Square (Existing)

Bay Area AQMD Air District, Mitigation Report

Construction Mitigation Summary

Phase	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Demolition	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

OFFROAD Equipment Mitigation

Equipment Type	Fuel Type	Tier	Number Mitigated	Total Number of Equipment	DPF	Oxidation Catalyst
Concrete/Industrial Saws	Diesel	No Change	0	1	No Change	0.00
Excavators	Diesel	No Change	0	3	No Change	0.00
Rubber Tired Dozers	Diesel	No Change	0	2	No Change	0.00

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	Unmitigated tons/yr						Unmitigated mt/yr					
Concrete/Industrial Saws	4.18000E-003	3.29900E-002	3.68700E-002	6.00000E-005	1.98000E-003	1.98000E-003	0.00000E+000	5.37656E+000	5.37656E+000	3.40000E-004	0.00000E+000	5.38508E+000
Excavators	7.35000E-003	7.23800E-002	9.80300E-002	1.50000E-004	3.51000E-003	3.23000E-003	0.00000E+000	1.36110E+001	1.36110E+001	4.40000E-003	0.00000E+000	1.37211E+001
Rubber Tired Dozers	2.15900E-002	2.26640E-001	8.26300E-002	1.70000E-004	1.11000E-002	1.02100E-002	0.00000E+000	1.50111E+001	1.50111E+001	4.85000E-003	0.00000E+000	1.51324E+001

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Mitigated tons/yr							Mitigated mt/yr					
Concrete/Industrial Saws	4.18000E-003	3.29900E-002	3.68700E-002	6.00000E-005	1.98000E-003	1.98000E-003	0.00000E+000	5.37656E+000	5.37656E+000	3.40000E-004	0.00000E+000	5.38507E+000
Excavators	7.35000E-003	7.23800E-002	9.80300E-002	1.50000E-004	3.51000E-003	3.23000E-003	0.00000E+000	1.36110E+001	1.36110E+001	4.40000E-003	0.00000E+000	1.37210E+001
Rubber Tired Dozers	2.15900E-002	2.26640E-001	8.26300E-002	1.70000E-004	1.11000E-002	1.02100E-002	0.00000E+000	1.50110E+001	1.50110E+001	4.85000E-003	0.00000E+000	1.51324E+001

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Concrete/Industrial Saws	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.85698E-006
Excavators	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	7.34700E-007	7.34700E-007	0.00000E+000	0.00000E+000	1.45761E-006
Rubber Tired Dozers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.33235E-006	1.33235E-006	0.00000E+000	0.00000E+000	1.32167E-006

Fugitive Dust Mitigation

Yes/No	Mitigation Measure	Mitigation Input		Mitigation Input		Mitigation Input	
No	Soil Stabilizer for unpaved Roads	PM10 Reduction		PM2.5 Reduction			
No	Replace Ground Cover of Area Disturbed	PM10 Reduction		PM2.5 Reduction			
No	Water Exposed Area	PM10 Reduction		PM2.5 Reduction		Frequency (per day)	
No	Unpaved Road Mitigation	Moisture Content %		Vehicle Speed (mph)	0.00		
No	Clean Paved Road	% PM Reduction	0.00				

		Unmitigated		Mitigated		Percent Reduction	
Phase	Source	PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
Demolition	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Demolition	Roads	0.00	0.00	0.00	0.00	0.00	0.00

Operational Percent Reduction Summary

Category	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Architectural Coating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electricity	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hearth	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Natural Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Indoor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Outdoor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Operational Mobile Mitigation

Project Setting:

Mitigation	Category	Measure	% Reduction	Input Value 1	Input Value 2	Input Value
No	Land Use	Increase Density	0.00			
No	Land Use	Increase Diversity	0.11	0.33		

No	Land Use	Improve Walkability Design	0.00			
No	Land Use	Improve Destination Accessibility	0.00			
No	Land Use	Increase Transit Accessibility	0.25			
No	Land Use	Integrate Below Market Rate Housing	0.00			
	Land Use	Land Use SubTotal	0.00			
No	Neighborhood Enhancements	Improve Pedestrian Network				
No	Neighborhood Enhancements	Provide Traffic Calming Measures				
No	Neighborhood Enhancements	Implement NEV Network	0.00			
	Neighborhood Enhancements	Neighborhood Enhancements Subtotal	0.00			
No	Parking Policy Pricing	Limit Parking Supply	0.00			
No	Parking Policy Pricing	Unbundle Parking Costs	0.00			
No	Parking Policy Pricing	On-street Market Pricing	0.00			
	Parking Policy Pricing	Parking Policy Pricing Subtotal	0.00			
No	Transit Improvements	Provide BRT System	0.00			
No	Transit Improvements	Expand Transit Network	0.00			
No	Transit Improvements	Increase Transit Frequency	0.00			
	Transit Improvements	Transit Improvements Subtotal	0.00			
		Land Use and Site Enhancement Subtotal	0.00			
No	Commute	Implement Trip Reduction Program				
No	Commute	Transit Subsidy				
No	Commute	Implement Employee Parking "Cash Out"				
No	Commute	Workplace Parking Charge				

No	Commute	Encourage Telecommuting and Alternative Work Schedules	0.00			
No	Commute	Market Commute Trip Reduction Option	0.00			
No	Commute	Employee Vanpool/Shuttle	0.00		2.00	
No	Commute	Provide Ride Sharing Program				
	Commute	Commute Subtotal	0.00			
No	School Trip	Implement School Bus Program	0.00			
		Total VMT Reduction	0.00			

Area Mitigation

Measure Implemented	Mitigation Measure	Input Value
No	Only Natural Gas Hearth	
No	No Hearth	
No	Use Low VOC Cleaning Supplies	
No	Use Low VOC Paint (Residential Interior)	100.00
No	Use Low VOC Paint (Residential Exterior)	150.00
No	Use Low VOC Paint (Non-residential Interior)	100.00
No	Use Low VOC Paint (Non-residential Exterior)	150.00
No	Use Low VOC Paint (Parking)	150.00
No	% Electric Lawnmower	
No	% Electric Leafblower	
No	% Electric Chainsaw	

Energy Mitigation Measures

Measure Implemented	Mitigation Measure	Input Value 1	Input Value 2
No	Exceed Title 24		
No	Install High Efficiency Lighting		
No	On-site Renewable		

Appliance Type	Land Use Subtype	% Improvement
ClothWasher		30.00
DishWasher		15.00
Fan		50.00
Refrigerator		15.00

Water Mitigation Measures

Measure Implemented	Mitigation Measure	Input Value 1	Input Value 2
No	Apply Water Conservation on Strategy		
No	Use Reclaimed Water		
No	Use Grey Water		
No	Install low-flow bathroom faucet	32.00	
No	Install low-flow Kitchen faucet	18.00	
No	Install low-flow Toilet	20.00	
No	Install low-flow Shower	20.00	
No	Turf Reduction		
No	Use Water Efficient Irrigation Systems	6.10	
No	Water Efficient Landscape		

Solid Waste Mitigation

Mitigation Measures	Input Value
Institute Recycling and Composting Services Percent Reduction in Waste Disposed	

Pinole Square Project
CalEEMod Results
Proposed Project

Pinole Square (Proposed) - Unmitigated

Bay Area AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	384.00	Space	3.46	153,600.00	0
Fast Food Restaurant with Drive Thru	3.00	1000sqft	0.07	3,005.00	0
Convenience Market With Gas Pumps	16.00	Pump	0.05	2,258.80	0
Regional Shopping Center	89.19	1000sqft	8.31	89,190.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 64

Climate Zone 5 **Operational Year** 2022

Utility Company Pacific Gas & Electric Company

CO2 Intensity (lb/MWhr) 269.5 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Pinole Square (Proposed) - Unmitigated - Bay Area AQMD Air District, Annual

Project Characteristics - Intensity factor for CO2 adjusted based on PG&E’s RPS reductions

Land Use - Acreage updated per Applicant-provided information

Construction Phase - Applicant provided

Demolition - Applicant provided

Grading - Applicant provided

Vehicle Trips - Per Transportation Impact Study

Energy Use -

Mobile Land Use Mitigation - Applicant provided

Energy Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	20.00	26.00
tblConstructionPhase	NumDays	10.00	13.00
tblConstructionPhase	NumDays	30.00	39.00
tblConstructionPhase	NumDays	20.00	26.00
tblConstructionPhase	NumDays	300.00	390.00
tblConstructionPhase	NumDays	20.00	380.00
tblConstructionPhase	PhaseEndDate	2/28/2020	3/9/2020
tblConstructionPhase	PhaseEndDate	3/13/2020	3/26/2020
tblConstructionPhase	PhaseEndDate	4/24/2020	5/20/2020
tblConstructionPhase	PhaseEndDate	7/16/2021	6/25/2020
tblConstructionPhase	PhaseEndDate	6/18/2021	12/23/2021
tblConstructionPhase	PhaseEndDate	8/13/2021	12/23/2021
tblConstructionPhase	PhaseStartDate	2/29/2020	3/10/2020
tblConstructionPhase	PhaseStartDate	3/14/2020	3/27/2020
tblConstructionPhase	PhaseStartDate	6/19/2021	5/21/2020
tblConstructionPhase	PhaseStartDate	4/25/2020	6/26/2020

tblConstructionPhase	PhaseStartDate	7/17/2021	7/10/2020
tblGrading	AcresOfGrading	97.50	11.89
tblGrading	MaterialExported	0.00	2,215.00
tblGrading	MaterialImported	0.00	550.00
tblLandUse	LandUseSquareFeet	3,000.00	3,005.00
tblLandUse	LotAcreage	2.05	8.31
tblProjectCharacteristics	CO2IntensityFactor	641.35	269.5
tblVehicleTrips	ST_TR	204.47	86.00
tblVehicleTrips	ST_TR	722.03	423.29
tblVehicleTrips	ST_TR	49.97	62.36
tblVehicleTrips	SU_TR	166.88	86.00
tblVehicleTrips	SU_TR	542.72	423.29
tblVehicleTrips	SU_TR	25.24	62.36
tblVehicleTrips	WD_TR	542.60	86.00
tblVehicleTrips	WD_TR	496.12	423.29
tblVehicleTrips	WD_TR	42.70	62.36

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.5510	3.7094	2.7972	5.9400e-003	0.3695	0.1727	0.5422	0.1601	0.1612	0.3214	0.0000	528.1486	528.1486	0.1082	0.0000	530.8532
2021	0.6835	2.9941	2.8074	6.3000e-003	0.1491	0.1362	0.2853	0.0405	0.1287	0.1692	0.0000	560.5559	560.5559	0.0823	0.0000	562.6141
Maximum	**0.6835**	**3.7094**	**2.8074**	**6.3000e-003**	**0.3695**	**0.1727**	**0.5422**	**0.1601**	**0.1612**	**0.3214**	**0.0000**	**560.5559**	**560.5559**	**0.1082**	**0.0000**	**562.6141**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.5510	3.7094	2.7972	5.9400e-003	0.3695	0.1727	0.5422	0.1601	0.1612	0.3214	0.0000	528.1482	528.1482	0.1082	0.0000	530.8527
2021	0.6835	2.9941	2.8074	6.3000e-003	0.1491	0.1362	0.2853	0.0405	0.1287	0.1692	0.0000	560.5555	560.5555	0.0823	0.0000	562.6137
Maximum	**0.6835**	**3.7094**	**2.8074**	**6.3000e-003**	**0.3695**	**0.1727**	**0.5422**	**0.1601**	**0.1612**	**0.3214**	**0.0000**	**560.5555**	**560.5555**	**0.1082**	**0.0000**	**562.6137**

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

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	2-3-2020	5-2-2020	1.5630	1.5630
2	5-3-2020	8-2-2020	0.9756	0.9756
3	8-3-2020	11-2-2020	1.0352	1.0352
4	11-3-2020	2-2-2021	1.0064	1.0064
5	2-3-2021	5-2-2021	0.9173	0.9173
6	5-3-2021	8-2-2021	0.9458	0.9458
7	8-3-2021	9-30-2021	0.6065	0.6065
		Highest	1.5630	1.5630

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.4317	4.0000e-005	4.5300e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	8.7900e-003	8.7900e-003	2.0000e-005	0.0000	9.3700e-003
Energy	4.9900e-003	0.0454	0.0381	2.7000e-004		3.4500e-003	3.4500e-003		3.4500e-003	3.4500e-003	0.0000	183.7487	183.7487	0.0154	3.9000e-003	185.2951
Mobile	1.7583	7.9900	16.4753	0.0526	4.3456	0.0490	4.3946	1.1664	0.0459	1.2122	0.0000	4,829.8061	4,829.8061	0.2024	0.0000	4,834.8648
Waste						0.0000	0.0000		0.0000	0.0000	26.0255	0.0000	26.0255	1.5381	0.0000	64.4770
Water						0.0000	0.0000		0.0000	0.0000	2.4379	6.8841	9.3220	0.2511	6.0700e-003	17.4081
Total	**2.1950**	**8.0354**	**16.5180**	**0.0528**	**4.3456**	**0.0525**	**4.3981**	**1.1664**	**0.0493**	**1.2157**	**28.4634**	**5,020.4477**	**5,048.9111**	**2.0070**	**9.9700e-003**	**5,102.0544**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.4317	4.0000e-005	4.5300e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	8.7900e-003	8.7900e-003	2.0000e-005	0.0000	9.3700e-003
Energy	4.2200e-003	0.0384	0.0322	2.3000e-004		2.9100e-003	2.9100e-003		2.9100e-003	2.9100e-003	0.0000	168.3131	168.3131	0.0144	3.5800e-003	169.7413
Mobile	1.7055	7.6053	15.2676	0.0471	3.8328	0.0443	3.8771	1.0288	0.0414	1.0702	0.0000	4,325.8159	4,325.8159	0.1883	0.0000	4,330.5234
Waste						0.0000	0.0000		0.0000	0.0000	26.0255	0.0000	26.0255	1.5381	0.0000	64.4770
Water						0.0000	0.0000		0.0000	0.0000	2.4379	6.8841	9.3220	0.2511	6.0700e-003	17.4081
Total	**2.1414**	**7.6437**	**15.3044**	**0.0473**	**3.8328**	**0.0472**	**3.8800**	**1.0288**	**0.0444**	**1.0731**	**28.4634**	**4,501.0219**	**4,529.4853**	**1.9919**	**9.6500e-003**	**4,582.1592**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**2.44**	**4.87**	**7.35**	**10.47**	**11.80**	**10.04**	**11.78**	**11.80**	**10.10**	**11.73**	**0.00**	**10.35**	**10.29**	**0.75**	**3.21**	**10.19**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	2/3/2020	3/9/2020	5	26	
2	Site Preparation	Site Preparation	3/10/2020	3/26/2020	5	13	
3	Grading	Grading	3/27/2020	5/20/2020	5	39	
4	Building Construction	Building Construction	6/26/2020	12/23/2021	5	390	
5	Paving	Paving	5/21/2020	6/25/2020	5	26	
6	Architectural Coating	Architectural Coating	7/10/2020	12/23/2021	5	380	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 11.89

Acres of Paving: 3.46

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 141,681; Non-Residential Outdoor: 47,227; Striped Parking Area: 9,216 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48
Grading	Scrapers	2	8.00	367	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	342.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	346.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	95.00	41.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	19.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0371	0.0000	0.0371	5.6100e-003	0.0000	5.6100e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0431	0.4316	0.2828	5.0000e-004		0.0216	0.0216		0.0200	0.0200	0.0000	44.1982	44.1982	0.0125	0.0000	44.5101
Total	**0.0431**	**0.4316**	**0.2828**	**5.0000e-004**	**0.0371**	**0.0216**	**0.0586**	**5.6100e-003**	**0.0200**	**0.0257**	**0.0000**	**44.1982**	**44.1982**	**0.0125**	**0.0000**	**44.5101**

3.2 Demolition - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.4300e-003	0.0500	0.0101	1.4000e-004	2.8900e-003	1.6000e-004	3.0500e-003	7.9000e-004	1.5000e-004	9.5000e-004	0.0000	13.1050	13.1050	6.7000e-004	0.0000	13.1219
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.5000e-004	4.6000e-004	4.7900e-003	1.0000e-005	1.5400e-003	1.0000e-005	1.5500e-003	4.1000e-004	1.0000e-005	4.2000e-004	0.0000	1.3500	1.3500	3.0000e-005	0.0000	1.3508
Total	**2.0800e-003**	**0.0505**	**0.0148**	**1.5000e-004**	**4.4300e-003**	**1.7000e-004**	**4.6000e-003**	**1.2000e-003**	**1.6000e-004**	**1.3700e-003**	**0.0000**	**14.4549**	**14.4549**	**7.0000e-004**	**0.0000**	**14.4726**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0371	0.0000	0.0371	5.6100e-003	0.0000	5.6100e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0431	0.4316	0.2828	5.0000e-004		0.0216	0.0216		0.0200	0.0200	0.0000	44.1981	44.1981	0.0125	0.0000	44.5101
Total	**0.0431**	**0.4316**	**0.2828**	**5.0000e-004**	**0.0371**	**0.0216**	**0.0586**	**5.6100e-003**	**0.0200**	**0.0257**	**0.0000**	**44.1981**	**44.1981**	**0.0125**	**0.0000**	**44.5101**

3.2 Demolition - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.4300e-003	0.0500	0.0101	1.4000e-004	2.8900e-003	1.6000e-004	3.0500e-003	7.9000e-004	1.5000e-004	9.5000e-004	0.0000	13.1050	13.1050	6.7000e-004	0.0000	13.1219
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.5000e-004	4.6000e-004	4.7900e-003	1.0000e-005	1.5400e-003	1.0000e-005	1.5500e-003	4.1000e-004	1.0000e-005	4.2000e-004	0.0000	1.3500	1.3500	3.0000e-005	0.0000	1.3508
Total	**2.0800e-003**	**0.0505**	**0.0148**	**1.5000e-004**	**4.4300e-003**	**1.7000e-004**	**4.6000e-003**	**1.2000e-003**	**1.6000e-004**	**1.3700e-003**	**0.0000**	**14.4549**	**14.4549**	**7.0000e-004**	**0.0000**	**14.4726**

3.3 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1174	0.0000	0.1174	0.0646	0.0000	0.0646	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0265	0.2757	0.1398	2.5000e-004		0.0143	0.0143		0.0131	0.0131	0.0000	21.7299	21.7299	7.0300e-003	0.0000	21.9056
Total	**0.0265**	**0.2757**	**0.1398**	**2.5000e-004**	**0.1174**	**0.0143**	**0.1317**	**0.0646**	**0.0131**	**0.0777**	**0.0000**	**21.7299**	**21.7299**	**7.0300e-003**	**0.0000**	**21.9056**

3.3 Site Preparation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.9000e-004	2.8000e-004	2.8700e-003	1.0000e-005	9.2000e-004	1.0000e-005	9.3000e-004	2.5000e-004	1.0000e-005	2.5000e-004	0.0000	0.8100	0.8100	2.0000e-005	0.0000	0.8105
Total	**3.9000e-004**	**2.8000e-004**	**2.8700e-003**	**1.0000e-005**	**9.2000e-004**	**1.0000e-005**	**9.3000e-004**	**2.5000e-004**	**1.0000e-005**	**2.5000e-004**	**0.0000**	**0.8100**	**0.8100**	**2.0000e-005**	**0.0000**	**0.8105**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1174	0.0000	0.1174	0.0646	0.0000	0.0646	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0265	0.2757	0.1398	2.5000e-004		0.0143	0.0143		0.0131	0.0131	0.0000	21.7299	21.7299	7.0300e-003	0.0000	21.9056
Total	**0.0265**	**0.2757**	**0.1398**	**2.5000e-004**	**0.1174**	**0.0143**	**0.1317**	**0.0646**	**0.0131**	**0.0777**	**0.0000**	**21.7299**	**21.7299**	**7.0300e-003**	**0.0000**	**21.9056**

3.3 Site Preparation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.9000e-004	2.8000e-004	2.8700e-003	1.0000e-005	9.2000e-004	1.0000e-005	9.3000e-004	2.5000e-004	1.0000e-005	2.5000e-004	0.0000	0.8100	0.8100	2.0000e-005	0.0000	0.8105
Total	**3.9000e-004**	**2.8000e-004**	**2.8700e-003**	**1.0000e-005**	**9.2000e-004**	**1.0000e-005**	**9.3000e-004**	**2.5000e-004**	**1.0000e-005**	**2.5000e-004**	**0.0000**	**0.8100**	**0.8100**	**2.0000e-005**	**0.0000**	**0.8105**

3.4 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1239	0.0000	0.1239	0.0653	0.0000	0.0653	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0868	0.9789	0.6232	1.2100e-003		0.0424	0.0424		0.0390	0.0390	0.0000	106.2444	106.2444	0.0344	0.0000	107.1034
Total	**0.0868**	**0.9789**	**0.6232**	**1.2100e-003**	**0.1239**	**0.0424**	**0.1663**	**0.0653**	**0.0390**	**0.1043**	**0.0000**	**106.2444**	**106.2444**	**0.0344**	**0.0000**	**107.1034**

3.4 Grading - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.4400e-003	0.0506	0.0102	1.4000e-004	2.9200e-003	1.6000e-004	3.0900e-003	8.0000e-004	1.6000e-004	9.6000e-004	0.0000	13.2583	13.2583	6.8000e-004	0.0000	13.2753
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2900e-003	9.2000e-004	9.5800e-003	3.0000e-005	3.0800e-003	2.0000e-005	3.1000e-003	8.2000e-004	2.0000e-005	8.4000e-004	0.0000	2.6999	2.6999	7.0000e-005	0.0000	2.7015
Total	**2.7300e-003**	**0.0515**	**0.0197**	**1.7000e-004**	**6.0000e-003**	**1.8000e-004**	**6.1900e-003**	**1.6200e-003**	**1.8000e-004**	**1.8000e-003**	**0.0000**	**15.9581**	**15.9581**	**7.5000e-004**	**0.0000**	**15.9769**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1239	0.0000	0.1239	0.0653	0.0000	0.0653	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0868	0.9789	0.6232	1.2100e-003		0.0424	0.0424		0.0390	0.0390	0.0000	106.2443	106.2443	0.0344	0.0000	107.1033
Total	**0.0868**	**0.9789**	**0.6232**	**1.2100e-003**	**0.1239**	**0.0424**	**0.1663**	**0.0653**	**0.0390**	**0.1043**	**0.0000**	**106.2443**	**106.2443**	**0.0344**	**0.0000**	**107.1033**

3.4 Grading - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.4400e-003	0.0506	0.0102	1.4000e-004	2.9200e-003	1.6000e-004	3.0900e-003	8.0000e-004	1.6000e-004	9.6000e-004	0.0000	13.2583	13.2583	6.8000e-004	0.0000	13.2753
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2900e-003	9.2000e-004	9.5800e-003	3.0000e-005	3.0800e-003	2.0000e-005	3.1000e-003	8.2000e-004	2.0000e-005	8.4000e-004	0.0000	2.6999	2.6999	7.0000e-005	0.0000	2.7015
Total	**2.7300e-003**	**0.0515**	**0.0197**	**1.7000e-004**	**6.0000e-003**	**1.8000e-004**	**6.1900e-003**	**1.6200e-003**	**1.8000e-004**	**1.8000e-003**	**0.0000**	**15.9581**	**15.9581**	**7.5000e-004**	**0.0000**	**15.9769**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1431	1.2951	1.1373	1.8200e-003		0.0754	0.0754		0.0709	0.0709	0.0000	156.3367	156.3367	0.0381	0.0000	157.2903
Total	**0.1431**	**1.2951**	**1.1373**	**1.8200e-003**		**0.0754**	**0.0754**		**0.0709**	**0.0709**	**0.0000**	**156.3367**	**156.3367**	**0.0381**	**0.0000**	**157.2903**

3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0107	0.3193	0.0803	7.5000e-004	0.0182	1.5600e-003	0.0197	5.2500e-003	1.4900e-003	6.7400e-003	0.0000	72.4585	72.4585	3.7400e-003	0.0000	72.5520
Worker	0.0213	0.0152	0.1575	4.9000e-004	0.0507	3.4000e-004	0.0510	0.0135	3.1000e-004	0.0138	0.0000	44.3925	44.3925	1.0700e-003	0.0000	44.4194
Total	**0.0320**	**0.3345**	**0.2378**	**1.2400e-003**	**0.0688**	**1.9000e-003**	**0.0707**	**0.0187**	**1.8000e-003**	**0.0205**	**0.0000**	**116.8510**	**116.8510**	**4.8100e-003**	**0.0000**	**116.9713**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1431	1.2951	1.1373	1.8200e-003		0.0754	0.0754		0.0709	0.0709	0.0000	156.3366	156.3366	0.0381	0.0000	157.2901
Total	**0.1431**	**1.2951**	**1.1373**	**1.8200e-003**		**0.0754**	**0.0754**		**0.0709**	**0.0709**	**0.0000**	**156.3366**	**156.3366**	**0.0381**	**0.0000**	**157.2901**

3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0107	0.3193	0.0803	7.5000e-004	0.0182	1.5600e-003	0.0197	5.2500e-003	1.4900e-003	6.7400e-003	0.0000	72.4585	72.4585	3.7400e-003	0.0000	72.5520
Worker	0.0213	0.0152	0.1575	4.9000e-004	0.0507	3.4000e-004	0.0510	0.0135	3.1000e-004	0.0138	0.0000	44.3925	44.3925	1.0700e-003	0.0000	44.4194
Total	**0.0320**	**0.3345**	**0.2378**	**1.2400e-003**	**0.0688**	**1.9000e-003**	**0.0707**	**0.0187**	**1.8000e-003**	**0.0205**	**0.0000**	**116.8510**	**116.8510**	**4.8100e-003**	**0.0000**	**116.9713**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2424	2.2226	2.1133	3.4300e-003		0.1222	0.1222		0.1149	0.1149	0.0000	295.3375	295.3375	0.0713	0.0000	297.1188
Total	**0.2424**	**2.2226**	**2.1133**	**3.4300e-003**		**0.1222**	**0.1222**		**0.1149**	**0.1149**	**0.0000**	**295.3375**	**295.3375**	**0.0713**	**0.0000**	**297.1188**

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0166	0.5460	0.1363	1.4100e-003	0.0343	1.1900e-003	0.0355	9.9100e-003	1.1400e-003	0.0111	0.0000	135.5721	135.5721	6.6600e-003	0.0000	135.7387
Worker	0.0372	0.0257	0.2717	8.9000e-004	0.0957	6.3000e-004	0.0963	0.0255	5.8000e-004	0.0260	0.0000	80.9103	80.9103	1.8100e-003	0.0000	80.9557
Total	**0.0538**	**0.5717**	**0.4080**	**2.3000e-003**	**0.1300**	**1.8200e-003**	**0.1318**	**0.0354**	**1.7200e-003**	**0.0371**	**0.0000**	**216.4823**	**216.4823**	**8.4700e-003**	**0.0000**	**216.6943**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2424	2.2226	2.1133	3.4300e-003		0.1222	0.1222		0.1149	0.1149	0.0000	295.3372	295.3372	0.0713	0.0000	297.1185
Total	**0.2424**	**2.2226**	**2.1133**	**3.4300e-003**		**0.1222**	**0.1222**		**0.1149**	**0.1149**	**0.0000**	**295.3372**	**295.3372**	**0.0713**	**0.0000**	**297.1185**

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0166	0.5460	0.1363	1.4100e-003	0.0343	1.1900e-003	0.0355	9.9100e-003	1.1400e-003	0.0111	0.0000	135.5721	135.5721	6.6600e-003	0.0000	135.7387
Worker	0.0372	0.0257	0.2717	8.9000e-004	0.0957	6.3000e-004	0.0963	0.0255	5.8000e-004	0.0260	0.0000	80.9103	80.9103	1.8100e-003	0.0000	80.9557
Total	**0.0538**	**0.5717**	**0.4080**	**2.3000e-003**	**0.1300**	**1.8200e-003**	**0.1318**	**0.0354**	**1.7200e-003**	**0.0371**	**0.0000**	**216.4823**	**216.4823**	**8.4700e-003**	**0.0000**	**216.6943**

3.6 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0176	0.1829	0.1905	3.0000e-004		9.7900e-003	9.7900e-003		9.0000e-003	9.0000e-003	0.0000	26.0367	26.0367	8.4200e-003	0.0000	26.2472
Paving	4.5300e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0222**	**0.1829**	**0.1905**	**3.0000e-004**		**9.7900e-003**	**9.7900e-003**		**9.0000e-003**	**9.0000e-003**	**0.0000**	**26.0367**	**26.0367**	**8.4200e-003**	**0.0000**	**26.2472**

3.6 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.5000e-004	4.6000e-004	4.7900e-003	1.0000e-005	1.5400e-003	1.0000e-005	1.5500e-003	4.1000e-004	1.0000e-005	4.2000e-004	0.0000	1.3500	1.3500	3.0000e-005	0.0000	1.3508
Total	**6.5000e-004**	**4.6000e-004**	**4.7900e-003**	**1.0000e-005**	**1.5400e-003**	**1.0000e-005**	**1.5500e-003**	**4.1000e-004**	**1.0000e-005**	**4.2000e-004**	**0.0000**	**1.3500**	**1.3500**	**3.0000e-005**	**0.0000**	**1.3508**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0176	0.1829	0.1905	3.0000e-004		9.7900e-003	9.7900e-003		9.0000e-003	9.0000e-003	0.0000	26.0367	26.0367	8.4200e-003	0.0000	26.2472
Paving	4.5300e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0222**	**0.1829**	**0.1905**	**3.0000e-004**		**9.7900e-003**	**9.7900e-003**		**9.0000e-003**	**9.0000e-003**	**0.0000**	**26.0367**	**26.0367**	**8.4200e-003**	**0.0000**	**26.2472**

3.6 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.5000e-004	4.6000e-004	4.7900e-003	1.0000e-005	1.5400e-003	1.0000e-005	1.5500e-003	4.1000e-004	1.0000e-005	4.2000e-004	0.0000	1.3500	1.3500	3.0000e-005	0.0000	1.3508
Total	**6.5000e-004**	**4.6000e-004**	**4.7900e-003**	**1.0000e-005**	**1.5400e-003**	**1.0000e-005**	**1.5500e-003**	**4.1000e-004**	**1.0000e-005**	**4.2000e-004**	**0.0000**	**1.3500**	**1.3500**	**3.0000e-005**	**0.0000**	**1.3508**

3.7 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.1726					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0151	0.1052	0.1145	1.9000e-004		6.9300e-003	6.9300e-003		6.9300e-003	6.9300e-003	0.0000	15.9578	15.9578	1.2400e-003	0.0000	15.9887
Total	**0.1877**	**0.1052**	**0.1145**	**1.9000e-004**		**6.9300e-003**	**6.9300e-003**		**6.9300e-003**	**6.9300e-003**	**0.0000**	**15.9578**	**15.9578**	**1.2400e-003**	**0.0000**	**15.9887**

3.7 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.9400e-003	2.8200e-003	0.0292	9.0000e-005	9.3800e-003	6.0000e-005	9.4500e-003	2.5000e-003	6.0000e-005	2.5500e-003	0.0000	8.2208	8.2208	2.0000e-004	0.0000	8.2258
Total	**3.9400e-003**	**2.8200e-003**	**0.0292**	**9.0000e-005**	**9.3800e-003**	**6.0000e-005**	**9.4500e-003**	**2.5000e-003**	**6.0000e-005**	**2.5500e-003**	**0.0000**	**8.2208**	**8.2208**	**2.0000e-004**	**0.0000**	**8.2258**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.1726					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0151	0.1052	0.1145	1.9000e-004		6.9300e-003	6.9300e-003		6.9300e-003	6.9300e-003	0.0000	15.9578	15.9578	1.2400e-003	0.0000	15.9887
Total	**0.1877**	**0.1052**	**0.1145**	**1.9000e-004**		**6.9300e-003**	**6.9300e-003**		**6.9300e-003**	**6.9300e-003**	**0.0000**	**15.9578**	**15.9578**	**1.2400e-003**	**0.0000**	**15.9887**

3.7 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.9400e-003	2.8200e-003	0.0292	9.0000e-005	9.3800e-003	6.0000e-005	9.4500e-003	2.5000e-003	6.0000e-005	2.5500e-003	0.0000	8.2208	8.2208	2.0000e-004	0.0000	8.2258
Total	**3.9400e-003**	**2.8200e-003**	**0.0292**	**9.0000e-005**	**9.3800e-003**	**6.0000e-005**	**9.4500e-003**	**2.5000e-003**	**6.0000e-005**	**2.5500e-003**	**0.0000**	**8.2208**	**8.2208**	**2.0000e-004**	**0.0000**	**8.2258**

3.7 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.3520					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0279	0.1947	0.2317	3.8000e-004		0.0120	0.0120		0.0120	0.0120	0.0000	32.5540	32.5540	2.2300e-003	0.0000	32.6098
Total	**0.3799**	**0.1947**	**0.2317**	**3.8000e-004**		**0.0120**	**0.0120**		**0.0120**	**0.0120**	**0.0000**	**32.5540**	**32.5540**	**2.2300e-003**	**0.0000**	**32.6098**

3.7 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.4300e-003	5.1300e-003	0.0543	1.8000e-004	0.0191	1.3000e-004	0.0193	5.0900e-003	1.2000e-004	5.2100e-003	0.0000	16.1821	16.1821	3.6000e-004	0.0000	16.1911
Total	**7.4300e-003**	**5.1300e-003**	**0.0543**	**1.8000e-004**	**0.0191**	**1.3000e-004**	**0.0193**	**5.0900e-003**	**1.2000e-004**	**5.2100e-003**	**0.0000**	**16.1821**	**16.1821**	**3.6000e-004**	**0.0000**	**16.1911**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.3520					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0279	0.1947	0.2317	3.8000e-004		0.0120	0.0120		0.0120	0.0120	0.0000	32.5540	32.5540	2.2300e-003	0.0000	32.6098
Total	**0.3799**	**0.1947**	**0.2317**	**3.8000e-004**		**0.0120**	**0.0120**		**0.0120**	**0.0120**	**0.0000**	**32.5540**	**32.5540**	**2.2300e-003**	**0.0000**	**32.6098**

3.7 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.4300e-003	5.1300e-003	0.0543	1.8000e-004	0.0191	1.3000e-004	0.0193	5.0900e-003	1.2000e-004	5.2100e-003	0.0000	16.1821	16.1821	3.6000e-004	0.0000	16.1911
Total	**7.4300e-003**	**5.1300e-003**	**0.0543**	**1.8000e-004**	**0.0191**	**1.3000e-004**	**0.0193**	**5.0900e-003**	**1.2000e-004**	**5.2100e-003**	**0.0000**	**16.1821**	**16.1821**	**3.6000e-004**	**0.0000**	**16.1911**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Diversity

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.7055	7.6053	15.2676	0.0471	3.8328	0.0443	3.8771	1.0288	0.0414	1.0702	0.0000	4,325.8159	4,325.8159	0.1883	0.0000	4,330.5234
Unmitigated	1.7583	7.9900	16.4753	0.0526	4.3456	0.0490	4.3946	1.1664	0.0459	1.2122	0.0000	4,829.8061	4,829.8061	0.2024	0.0000	4,834.8648

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Convenience Market With Gas Pumps	1,376.00	1,376.00	1376.00	738,092	650,997
Fast Food Restaurant with Drive Thru	1,269.87	1,269.87	1269.87	1,186,471	1,046,468
Parking Lot	0.00	0.00	0.00		
Regional Shopping Center	5,561.89	5,561.89	5561.89	9,751,686	8,600,987
Total	8,207.76	8,207.76	8,207.76	11,676,249	10,298,452

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Convenience Market With Gas	9.50	7.30	7.30	0.80	80.20	19.00	14	21	65
Fast Food Restaurant with Drive	9.50	7.30	7.30	2.20	78.80	19.00	29	21	50
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Convenience Market With Gas Pumps	0.576985	0.039376	0.193723	0.112069	0.016317	0.005358	0.017943	0.025814	0.002614	0.002274	0.005874	0.000887	0.000768
Fast Food Restaurant with Drive Thru	0.576985	0.039376	0.193723	0.112069	0.016317	0.005358	0.017943	0.025814	0.002614	0.002274	0.005874	0.000887	0.000768
Parking Lot	0.576985	0.039376	0.193723	0.112069	0.016317	0.005358	0.017943	0.025814	0.002614	0.002274	0.005874	0.000887	0.000768
Regional Shopping Center	0.576985	0.039376	0.193723	0.112069	0.016317	0.005358	0.017943	0.025814	0.002614	0.002274	0.005874	0.000887	0.000768

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	126.5666	126.5666	0.0136	2.8200e-003	127.7468
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	134.3731	134.3731	0.0145	2.9900e-003	135.6261
NaturalGas Mitigated	4.2200e-003	0.0384	0.0322	2.3000e-004		2.9100e-003	2.9100e-003		2.9100e-003	2.9100e-003	0.0000	41.7465	41.7465	8.0000e-004	7.7000e-004	41.9945
NaturalGas Unmitigated	4.9900e-003	0.0454	0.0381	2.7000e-004		3.4500e-003	3.4500e-003		3.4500e-003	3.4500e-003	0.0000	49.3756	49.3756	9.5000e-004	9.1000e-004	49.6690

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Convenience Market With Gas Pumps	10390.5	6.0000e-005	5.1000e-004	4.3000e-004	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.5545	0.5545	1.0000e-005	1.0000e-005	0.5578
Fast Food Restaurant with Drive Thru	504600	2.7200e-003	0.0247	0.0208	1.5000e-004		1.8800e-003	1.8800e-003		1.8800e-003	1.8800e-003	0.0000	26.9274	26.9274	5.2000e-004	4.9000e-004	27.0874
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	410274	2.2100e-003	0.0201	0.0169	1.2000e-004		1.5300e-003	1.5300e-003		1.5300e-003	1.5300e-003	0.0000	21.8938	21.8938	4.2000e-004	4.0000e-004	22.0239
Total		**4.9900e-003**	**0.0454**	**0.0381**	**2.7000e-004**		**3.4500e-003**	**3.4500e-003**		**3.4500e-003**	**3.4500e-003**	**0.0000**	**49.3756**	**49.3756**	**9.5000e-004**	**9.0000e-004**	**49.6690**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Convenience Market With Gas Pumps	7747.68	4.0000e-005	3.8000e-004	3.2000e-004	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.4135	0.4135	1.0000e-005	1.0000e-005	0.4159
Fast Food Restaurant with Drive Thru	468630	2.5300e-003	0.0230	0.0193	1.4000e-004		1.7500e-003	1.7500e-003		1.7500e-003	1.7500e-003	0.0000	25.0079	25.0079	4.8000e-004	4.6000e-004	25.1565
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	305922	1.6500e-003	0.0150	0.0126	9.0000e-005		1.1400e-003	1.1400e-003		1.1400e-003	1.1400e-003	0.0000	16.3252	16.3252	3.1000e-004	3.0000e-004	16.4222
Total		**4.2200e-003**	**0.0384**	**0.0322**	**2.3000e-004**		**2.9200e-003**	**2.9200e-003**		**2.9200e-003**	**2.9200e-003**	**0.0000**	**41.7465**	**41.7465**	**8.0000e-004**	**7.7000e-004**	**41.9945**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Convenience Market With Gas Pumps	23672.2	2.8938	3.1000e-004	6.0000e-005	2.9208
Fast Food Restaurant with Drive Thru	87084.9	10.6455	1.1500e-003	2.4000e-004	10.7448
Parking Lot	53760	6.5718	7.1000e-004	1.5000e-004	6.6331
Regional Shopping Center	934711	114.2620	0.0123	2.5400e-003	115.3275
Total		**134.3731**	**0.0145**	**2.9900e-003**	**135.6261**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Convenience Market With Gas Pumps	22154.3	2.7082	2.9000e-004	6.0000e-005	2.7335
Fast Food Restaurant with Drive Thru	84677.9	10.3513	1.1100e-003	2.3000e-004	10.4478
Parking Lot	53760	6.5718	7.1000e-004	1.5000e-004	6.6331
Regional Shopping Center	874776	106.9353	0.0115	2.3800e-003	107.9325
Total		**126.5666**	**0.0136**	**2.8200e-003**	**127.7468**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.4317	4.0000e-005	4.5300e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	8.7900e-003	8.7900e-003	2.0000e-005	0.0000	9.3700e-003
Unmitigated	0.4317	4.0000e-005	4.5300e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	8.7900e-003	8.7900e-003	2.0000e-005	0.0000	9.3700e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0525					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3788					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	4.2000e-004	4.0000e-005	4.5300e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	8.7900e-003	8.7900e-003	2.0000e-005	0.0000	9.3700e-003
Total	**0.4317**	**4.0000e-005**	**4.5300e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**8.7900e-003**	**8.7900e-003**	**2.0000e-005**	**0.0000**	**9.3700e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0525					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3788					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	4.2000e-004	4.0000e-005	4.5300e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	8.7900e-003	8.7900e-003	2.0000e-005	0.0000	9.3700e-003
Total	**0.4317**	**4.0000e-005**	**4.5300e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**8.7900e-003**	**8.7900e-003**	**2.0000e-005**	**0.0000**	**9.3700e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	9.3220	0.2511	6.0700e-003	17.4081
Unmitigated	9.3220	0.2511	6.0700e-003	17.4081

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Convenience Market With Gas Pumps	0.167315 / 0.102548	0.2076	5.4700e-003	1.3000e-004	0.3837
Fast Food Restaurant with Drive Thru	0.910601 / 0.0581235	0.9161	0.0297	7.1000e-004	1.8725
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	6.60653 / 4.04916	8.1983	0.2159	5.2200e-003	15.1518
Total		**9.3220**	**0.2511**	**6.0600e-003**	**17.4081**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Convenience Market With Gas Pumps	0.167315 / 0.102548	0.2076	5.4700e-003	1.3000e-004	0.3837
Fast Food Restaurant with Drive Thru	0.910601 / 0.0581235	0.9161	0.0297	7.1000e-004	1.8725
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	6.60653 / 4.04916	8.1983	0.2159	5.2200e-003	15.1518
Total		**9.3220**	**0.2511**	**6.0600e-003**	**17.4081**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	26.0255	1.5381	0.0000	64.4770
Unmitigated	26.0255	1.5381	0.0000	64.4770

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Fast Food Restaurant with Drive Thru	34.56	7.0154	0.4146	0.0000	17.3803
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	93.65	19.0101	1.1235	0.0000	47.0967
Total		**26.0255**	**1.5381**	**0.0000**	**64.4770**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Fast Food Restaurant with Drive Thru	34.56	7.0154	0.4146	0.0000	17.3803
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	93.65	19.0101	1.1235	0.0000	47.0967
Total		**26.0255**	**1.5381**	**0.0000**	**64.4770**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Pinole Square (Proposed) - Unmitigated

Bay Area AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	384.00	Space	3.46	153,600.00	0
Fast Food Restaurant with Drive Thru	3.00	1000sqft	0.07	3,005.00	0
Convenience Market With Gas Pumps	16.00	Pump	0.05	2,258.80	0
Regional Shopping Center	89.19	1000sqft	8.31	89,190.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	269.5	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Intensity factor for CO2 adjusted based on PG&E’s RPS reductions

Land Use - Acreage updated per Applicant-provided information

Construction Phase - Applicant provided

Demolition - Applicant provided

Grading - Applicant provided

Vehicle Trips - Per Transportation Impact Study

Energy Use -

Mobile Land Use Mitigation - Applicant provided

Energy Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	20.00	26.00
tblConstructionPhase	NumDays	10.00	13.00
tblConstructionPhase	NumDays	30.00	39.00
tblConstructionPhase	NumDays	20.00	26.00
tblConstructionPhase	NumDays	300.00	390.00
tblConstructionPhase	NumDays	20.00	380.00
tblConstructionPhase	PhaseEndDate	2/28/2020	3/9/2020
tblConstructionPhase	PhaseEndDate	3/13/2020	3/26/2020
tblConstructionPhase	PhaseEndDate	4/24/2020	5/20/2020
tblConstructionPhase	PhaseEndDate	7/16/2021	6/25/2020
tblConstructionPhase	PhaseEndDate	6/18/2021	12/23/2021
tblConstructionPhase	PhaseEndDate	8/13/2021	12/23/2021
tblConstructionPhase	PhaseStartDate	2/29/2020	3/10/2020
tblConstructionPhase	PhaseStartDate	3/14/2020	3/27/2020
tblConstructionPhase	PhaseStartDate	6/19/2021	5/21/2020
tblConstructionPhase	PhaseStartDate	4/25/2020	6/26/2020

tblConstructionPhase	PhaseStartDate	7/17/2021	7/10/2020
tblGrading	AcresOfGrading	97.50	11.89
tblGrading	MaterialExported	0.00	2,215.00
tblGrading	MaterialImported	0.00	550.00
tblLandUse	LandUseSquareFeet	3,000.00	3,005.00
tblLandUse	LotAcreage	2.05	8.31
tblProjectCharacteristics	CO2IntensityFactor	641.35	269.5
tblVehicleTrips	ST_TR	204.47	86.00
tblVehicleTrips	ST_TR	722.03	423.29
tblVehicleTrips	ST_TR	49.97	62.36
tblVehicleTrips	SU_TR	166.88	86.00
tblVehicleTrips	SU_TR	542.72	423.29
tblVehicleTrips	SU_TR	25.24	62.36
tblVehicleTrips	WD_TR	542.60	86.00
tblVehicleTrips	WD_TR	496.12	423.29
tblVehicleTrips	WD_TR	42.70	62.36

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	5.6745	52.7809	33.0000	0.0707	18.2141	2.1984	20.4125	9.9699	2.0225	11.9924	0.0000	6,924.8183	6,924.8183	1.9841	0.0000	6,974.4216
2021	5.3743	23.4101	22.1921	0.0501	1.2140	1.0678	2.2818	0.3283	1.0096	1.3379	0.0000	4,922.3758	4,922.3758	0.7111	0.0000	4,940.1537
Maximum	**5.6745**	**52.7809**	**33.0000**	**0.0707**	**18.2141**	**2.1984**	**20.4125**	**9.9699**	**2.0225**	**11.9924**	**0.0000**	**6,924.8183**	**6,924.8183**	**1.9841**	**0.0000**	**6,974.4216**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	5.6745	52.7809	33.0000	0.0707	18.2141	2.1984	20.4125	9.9699	2.0225	11.9924	0.0000	6,924.8183	6,924.8183	1.9841	0.0000	6,974.4216
2021	5.3743	23.4101	22.1921	0.0501	1.2140	1.0678	2.2818	0.3283	1.0096	1.3379	0.0000	4,922.3758	4,922.3758	0.7111	0.0000	4,940.1537
Maximum	**5.6745**	**52.7809**	**33.0000**	**0.0707**	**18.2141**	**2.1984**	**20.4125**	**9.9699**	**2.0225**	**11.9924**	**0.0000**	**6,924.8183**	**6,924.8183**	**1.9841**	**0.0000**	**6,974.4216**

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

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.3678	4.6000e-004	0.0503	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004		0.1077	0.1077	2.8000e-004		0.1148
Energy	0.0273	0.2485	0.2088	1.4900e-003		0.0189	0.0189		0.0189	0.0189		298.2318	298.2318	5.7200e-003	5.4700e-003	300.0040
Mobile	11.2585	42.9175	90.9228	0.3055	24.8065	0.2683	25.0748	6.6369	0.2510	6.8879		30,927.0735	30,927.0735	1.2130		30,957.3994
Total	**13.6537**	**43.1665**	**91.1819**	**0.3070**	**24.8065**	**0.2874**	**25.0938**	**6.6369**	**0.2701**	**6.9070**		**31,225.4130**	**31,225.4130**	**1.2190**	**5.4700e-003**	**31,257.5183**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.3678	4.6000e-004	0.0503	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004		0.1077	0.1077	2.8000e-004		0.1148
Energy	0.0231	0.2101	0.1765	1.2600e-003		0.0160	0.0160		0.0160	0.0160		252.1512	252.1512	4.8300e-003	4.6200e-003	253.6496
Mobile	10.9619	40.9272	83.4343	0.2735	21.8793	0.2423	22.1216	5.8537	0.2266	6.0804		27,692.8081	27,692.8081	1.1240		27,720.9068
Total	**13.3529**	**41.1378**	**83.6611**	**0.2747**	**21.8793**	**0.2585**	**22.1377**	**5.8537**	**0.2428**	**6.0965**		**27,945.0671**	**27,945.0671**	**1.1291**	**4.6200e-003**	**27,974.6712**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	2.20	4.70	8.25	10.50	11.80	10.07	11.78	11.80	10.11	11.73	0.00	10.51	10.51	7.38	15.54	10.50

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	2/3/2020	3/9/2020	5	26	
2	Site Preparation	Site Preparation	3/10/2020	3/26/2020	5	13	
3	Grading	Grading	3/27/2020	5/20/2020	5	39	
4	Building Construction	Building Construction	6/26/2020	12/23/2021	5	390	
5	Paving	Paving	5/21/2020	6/25/2020	5	26	
6	Architectural Coating	Architectural Coating	7/10/2020	12/23/2021	5	380	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 11.89

Acres of Paving: 3.46

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 141,681; Non-Residential Outdoor: 47,227; Striped Parking Area: 9,216 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48
Grading	Scrapers	2	8.00	367	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	342.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	346.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	95.00	41.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	19.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.8508	0.0000	2.8508	0.4316	0.0000	0.4316			0.0000			0.0000
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419		3,747.704 9	3,747.704 9	1.0580		3,774.153 6
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**2.8508**	**1.6587**	**4.5095**	**0.4316**	**1.5419**	**1.9735**		**3,747.704 9**	**3,747.704 9**	**1.0580**		**3,774.153 6**

3.2 Demolition - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1085	3.7679	0.7488	0.0105	0.2298	0.0123	0.2421	0.0630	0.0118	0.0748		1,119.1076	1,119.1076	0.0560		1,120.507 2
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0521	0.0316	0.4025	1.2400e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		123.1165	123.1165	2.9700e-003		123.1907
Total	**0.1607**	**3.7994**	**1.1513**	**0.0117**	**0.3530**	**0.0131**	**0.3661**	**0.0957**	**0.0125**	**0.1082**		**1,242.224 1**	**1,242.224 1**	**0.0590**		**1,243.697 8**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.8508	0.0000	2.8508	0.4316	0.0000	0.4316			0.0000			0.0000
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419	0.0000	3,747.704 9	3,747.704 9	1.0580		3,774.153 6
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**2.8508**	**1.6587**	**4.5095**	**0.4316**	**1.5419**	**1.9735**	**0.0000**	**3,747.704 9**	**3,747.704 9**	**1.0580**		**3,774.153 6**

3.2 Demolition - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1085	3.7679	0.7488	0.0105	0.2298	0.0123	0.2421	0.0630	0.0118	0.0748		1,119.1076	1,119.1076	0.0560		1,120.5072
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0521	0.0316	0.4025	1.2400e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		123.1165	123.1165	2.9700e-003		123.1907
Total	**0.1607**	**3.7994**	**1.1513**	**0.0117**	**0.3530**	**0.0131**	**0.3661**	**0.0957**	**0.0125**	**0.1082**		**1,242.2241**	**1,242.2241**	**0.0590**		**1,243.6978**

3.3 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216		3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0663**	**2.1974**	**20.2637**	**9.9307**	**2.0216**	**11.9523**		**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

3.3 Site Preparation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0626	0.0379	0.4830	1.4800e-003	0.1479	9.6000e-004	0.1488	0.0392	8.8000e-004	0.0401		147.7398	147.7398	3.5600e-003		147.8288
Total	**0.0626**	**0.0379**	**0.4830**	**1.4800e-003**	**0.1479**	**9.6000e-004**	**0.1488**	**0.0392**	**8.8000e-004**	**0.0401**		**147.7398**	**147.7398**	**3.5600e-003**		**147.8288**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216	0.0000	3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0663**	**2.1974**	**20.2637**	**9.9307**	**2.0216**	**11.9523**	**0.0000**	**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

3.3 Site Preparation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0626	0.0379	0.4830	1.4800e-003	0.1479	9.6000e-004	0.1488	0.0392	8.8000e-004	0.0401		147.7398	147.7398	3.5600e-003		147.8288
Total	**0.0626**	**0.0379**	**0.4830**	**1.4800e-003**	**0.1479**	**9.6000e-004**	**0.1488**	**0.0392**	**8.8000e-004**	**0.0401**		**147.7398**	**147.7398**	**3.5600e-003**		**147.8288**

3.4 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.3534	0.0000	6.3534	3.3464	0.0000	3.3464			0.0000			0.0000
Off-Road	4.4501	50.1975	31.9583	0.0620		2.1739	2.1739		2.0000	2.0000		6,005.8653	6,005.8653	1.9424		6,054.4257
Total	**4.4501**	**50.1975**	**31.9583**	**0.0620**	**6.3534**	**2.1739**	**8.5273**	**3.3464**	**2.0000**	**5.3463**		**6,005.8653**	**6,005.8653**	**1.9424**		**6,054.4257**

3.4 Grading - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0732	2.5413	0.5051	7.0600e-003	0.1550	8.3100e-003	0.1633	0.0425	7.9500e-003	0.0504		754.7977	754.7977	0.0378		755.7417
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0695	0.0421	0.5366	1.6500e-003	0.1643	1.0600e-003	0.1654	0.0436	9.8000e-004	0.0446		164.1553	164.1553	3.9600e-003		164.2542
Total	**0.1427**	**2.5834**	**1.0417**	**8.7100e-003**	**0.3193**	**9.3700e-003**	**0.3287**	**0.0861**	**8.9300e-003**	**0.0950**		**918.9530**	**918.9530**	**0.0417**		**919.9959**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.3534	0.0000	6.3534	3.3464	0.0000	3.3464			0.0000			0.0000
Off-Road	4.4501	50.1975	31.9583	0.0620		2.1739	2.1739		2.0000	2.0000	0.0000	6,005.8653	6,005.8653	1.9424		6,054.4257
Total	**4.4501**	**50.1975**	**31.9583**	**0.0620**	**6.3534**	**2.1739**	**8.5273**	**3.3464**	**2.0000**	**5.3463**	**0.0000**	**6,005.8653**	**6,005.8653**	**1.9424**		**6,054.4257**

3.4 Grading - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0732	2.5413	0.5051	7.0600e-003	0.1550	8.3100e-003	0.1633	0.0425	7.9500e-003	0.0504		754.7977	754.7977	0.0378		755.7417
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0695	0.0421	0.5366	1.6500e-003	0.1643	1.0600e-003	0.1654	0.0436	9.8000e-004	0.0446		164.1553	164.1553	3.9600e-003		164.2542
Total	**0.1427**	**2.5834**	**1.0417**	**8.7100e-003**	**0.3193**	**9.3700e-003**	**0.3287**	**0.0861**	**8.9300e-003**	**0.0950**		**918.9530**	**918.9530**	**0.0417**		**919.9959**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.0631	2,553.0631	0.6229		2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**		**2,553.0631**	**2,553.0631**	**0.6229**		**2,568.6345**

3.5 Building Construction - 2020

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1554	4.6725	1.1146	0.0113	0.2775	0.0229	0.3004	0.0799	0.0219	0.1018		1,196.0030	1,196.0030	0.0589		1,197.4754
Worker	0.3302	0.1999	2.5489	7.8200e-003	0.7804	5.0500e-003	0.7855	0.2070	4.6600e-003	0.2117		779.7377	779.7377	0.0188		780.2075
Total	**0.4856**	**4.8724**	**3.6635**	**0.0191**	**1.0579**	**0.0280**	**1.0859**	**0.2869**	**0.0266**	**0.3135**		**1,975.7407**	**1,975.7407**	**0.0777**		**1,977.6829**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.0631	2,553.0631	0.6229		2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**	**0.0000**	**2,553.0631**	**2,553.0631**	**0.6229**		**2,568.6345**

3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1554	4.6725	1.1146	0.0113	0.2775	0.0229	0.3004	0.0799	0.0219	0.1018		1,196.0030	1,196.0030	0.0589		1,197.4754
Worker	0.3302	0.1999	2.5489	7.8200e-003	0.7804	5.0500e-003	0.7855	0.2070	4.6600e-003	0.2117		779.7377	779.7377	0.0188		780.2075
Total	**0.4856**	**4.8724**	**3.6635**	**0.0191**	**1.0579**	**0.0280**	**1.0859**	**0.2869**	**0.0266**	**0.3135**		**1,975.7407**	**1,975.7407**	**0.0777**		**1,977.6829**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013		2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**		**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1272	4.2370	0.9991	0.0112	0.2775	9.1800e-003	0.2867	0.0799	8.7800e-003	0.0887		1,184.7300	1,184.7300	0.0556		1,186.1201
Worker	0.3055	0.1785	2.3335	7.5500e-003	0.7804	4.9100e-003	0.7853	0.2070	4.5200e-003	0.2115		752.3615	752.3615	0.0168		752.7820
Total	**0.4326**	**4.4155**	**3.3326**	**0.0187**	**1.0579**	**0.0141**	**1.0720**	**0.2869**	**0.0133**	**0.3002**		**1,937.0916**	**1,937.0916**	**0.0724**		**1,938.9021**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013	0.0000	2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**	**0.0000**	**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1272	4.2370	0.9991	0.0112	0.2775	9.1800e-003	0.2867	0.0799	8.7800e-003	0.0887		1,184.7300	1,184.7300	0.0556		1,186.1201
Worker	0.3055	0.1785	2.3335	7.5500e-003	0.7804	4.9100e-003	0.7853	0.2070	4.5200e-003	0.2115		752.3615	752.3615	0.0168		752.7820
Total	**0.4326**	**4.4155**	**3.3326**	**0.0187**	**1.0579**	**0.0141**	**1.0720**	**0.2869**	**0.0133**	**0.3002**		**1,937.0916**	**1,937.0916**	**0.0724**		**1,938.9021**

3.6 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926		2,207.7334	2,207.7334	0.7140		2,225.5841
Paving	0.3487					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.7052**	**14.0656**	**14.6521**	**0.0228**		**0.7528**	**0.7528**		**0.6926**	**0.6926**		**2,207.7334**	**2,207.7334**	**0.7140**		**2,225.5841**

3.6 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0521	0.0316	0.4025	1.2400e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		123.1165	123.1165	2.9700e-003		123.1907
Total	**0.0521**	**0.0316**	**0.4025**	**1.2400e-003**	**0.1232**	**8.0000e-004**	**0.1240**	**0.0327**	**7.4000e-004**	**0.0334**		**123.1165**	**123.1165**	**2.9700e-003**		**123.1907**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926	0.0000	2,207.7334	2,207.7334	0.7140		2,225.5841
Paving	0.3487					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.7052**	**14.0656**	**14.6521**	**0.0228**		**0.7528**	**0.7528**		**0.6926**	**0.6926**	**0.0000**	**2,207.7334**	**2,207.7334**	**0.7140**		**2,225.5841**

3.6 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0521	0.0316	0.4025	1.2400e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		123.1165	123.1165	2.9700e-003		123.1907
Total	**0.0521**	**0.0316**	**0.4025**	**1.2400e-003**	**0.1232**	**8.0000e-004**	**0.1240**	**0.0327**	**7.4000e-004**	**0.0334**		**123.1165**	**123.1165**	**2.9700e-003**		**123.1907**

3.7 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	2.7608					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	**3.0030**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.7 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0660	0.0400	0.5098	1.5600e-003	0.1561	1.0100e-003	0.1571	0.0414	9.3000e-004	0.0423		155.9476	155.9476	3.7600e-003		156.0415
Total	**0.0660**	**0.0400**	**0.5098**	**1.5600e-003**	**0.1561**	**1.0100e-003**	**0.1571**	**0.0414**	**9.3000e-004**	**0.0423**		**155.9476**	**155.9476**	**3.7600e-003**		**156.0415**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	2.7608					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928
Total	**3.0030**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**	**0.0000**	**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.7 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0660	0.0400	0.5098	1.5600e-003	0.1561	1.0100e-003	0.1571	0.0414	9.3000e-004	0.0423		155.9476	155.9476	3.7600e-003		156.0415
Total	**0.0660**	**0.0400**	**0.5098**	**1.5600e-003**	**0.1561**	**1.0100e-003**	**0.1571**	**0.0414**	**9.3000e-004**	**0.0423**		**155.9476**	**155.9476**	**3.7600e-003**		**156.0415**

3.7 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	2.7608					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941		281.4481	281.4481	0.0193		281.9309
Total	**2.9797**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**		**281.4481**	**281.4481**	**0.0193**		**281.9309**

3.7 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0611	0.0357	0.4667	1.5100e-003	0.1561	9.8000e-004	0.1571	0.0414	9.0000e-004	0.0423		150.4723	150.4723	3.3600e-003		150.5564
Total	**0.0611**	**0.0357**	**0.4667**	**1.5100e-003**	**0.1561**	**9.8000e-004**	**0.1571**	**0.0414**	**9.0000e-004**	**0.0423**		**150.4723**	**150.4723**	**3.3600e-003**		**150.5564**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	2.7608					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941	0.0000	281.4481	281.4481	0.0193		281.9309
Total	**2.9797**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**	**0.0000**	**281.4481**	**281.4481**	**0.0193**		**281.9309**

3.7 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0611	0.0357	0.4667	1.5100e-003	0.1561	9.8000e-004	0.1571	0.0414	9.0000e-004	0.0423		150.4723	150.4723	3.3600e-003		150.5564
Total	**0.0611**	**0.0357**	**0.4667**	**1.5100e-003**	**0.1561**	**9.8000e-004**	**0.1571**	**0.0414**	**9.0000e-004**	**0.0423**		**150.4723**	**150.4723**	**3.3600e-003**		**150.5564**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Diversity

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	10.9619	40.9272	83.4343	0.2735	21.8793	0.2423	22.1216	5.8537	0.2266	6.0804		27,692.8081	27,692.8081	1.1240		27,720.9068
Unmitigated	11.2585	42.9175	90.9228	0.3055	24.8065	0.2683	25.0748	6.6369	0.2510	6.8879		30,927.0735	30,927.0735	1.2130		30,957.3994

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Convenience Market With Gas Pumps	1,376.00	1,376.00	1376.00	738,092	650,997
Fast Food Restaurant with Drive Thru	1,269.87	1,269.87	1269.87	1,186,471	1,046,468
Parking Lot	0.00	0.00	0.00		
Regional Shopping Center	5,561.89	5,561.89	5561.89	9,751,686	8,600,987
Total	8,207.76	8,207.76	8,207.76	11,676,249	10,298,452

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Convenience Market With Gas	9.50	7.30	7.30	0.80	80.20	19.00	14	21	65
Fast Food Restaurant with Drive	9.50	7.30	7.30	2.20	78.80	19.00	29	21	50
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Convenience Market With Gas Pumps	0.576985	0.039376	0.193723	0.112069	0.016317	0.005358	0.017943	0.025814	0.002614	0.002274	0.005874	0.000887	0.000768
Fast Food Restaurant with Drive Thru	0.576985	0.039376	0.193723	0.112069	0.016317	0.005358	0.017943	0.025814	0.002614	0.002274	0.005874	0.000887	0.000768
Parking Lot	0.576985	0.039376	0.193723	0.112069	0.016317	0.005358	0.017943	0.025814	0.002614	0.002274	0.005874	0.000887	0.000768
Regional Shopping Center	0.576985	0.039376	0.193723	0.112069	0.016317	0.005358	0.017943	0.025814	0.002614	0.002274	0.005874	0.000887	0.000768

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0231	0.2101	0.1765	1.2600e-003		0.0160	0.0160		0.0160	0.0160		252.1512	252.1512	4.8300e-003	4.6200e-003	253.6496
NaturalGas Unmitigated	0.0273	0.2485	0.2088	1.4900e-003		0.0189	0.0189		0.0189	0.0189		298.2318	298.2318	5.7200e-003	5.4700e-003	300.0040

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Convenience Market With Gas Pumps	28.4671	3.1000e-004	2.7900e-003	2.3400e-003	2.0000e-005		2.1000e-004	2.1000e-004		2.1000e-004	2.1000e-004		3.3491	3.3491	6.0000e-005	6.0000e-005	3.3690
Fast Food Restaurant with Drive Thru	1382.46	0.0149	0.1355	0.1139	8.1000e-004		0.0103	0.0103		0.0103	0.0103		162.6429	162.6429	3.1200e-003	2.9800e-003	163.6094
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	1124.04	0.0121	0.1102	0.0926	6.6000e-004		8.3800e-003	8.3800e-003		8.3800e-003	8.3800e-003		132.2398	132.2398	2.5300e-003	2.4200e-003	133.0256
Total		**0.0273**	**0.2485**	**0.2088**	**1.4900e-003**		**0.0189**	**0.0189**		**0.0189**	**0.0189**		**298.2318**	**298.2318**	**5.7100e-003**	**5.4600e-003**	**300.0040**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Convenience Market With Gas Pumps	0.0212265	2.3000e-004	2.0800e-003	1.7500e-003	1.0000e-005		1.6000e-004	1.6000e-004		1.6000e-004	1.6000e-004		2.4972	2.4972	5.0000e-005	5.0000e-005	2.5121
Fast Food Restaurant with Drive Thru	1.28392	0.0139	0.1259	0.1057	7.6000e-004		9.5700e-003	9.5700e-003		9.5700e-003	9.5700e-003		151.0491	151.0491	2.9000e-003	2.7700e-003	151.9467
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	0.838142	9.0400e-003	0.0822	0.0690	4.9000e-004		6.2400e-003	6.2400e-003		6.2400e-003	6.2400e-003		98.6049	98.6049	1.8900e-003	1.8100e-003	99.1909
Total		**0.0231**	**0.2101**	**0.1765**	**1.2600e-003**		**0.0160**	**0.0160**		**0.0160**	**0.0160**		**252.1512**	**252.1512**	**4.8400e-003**	**4.6300e-003**	**253.6496**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	2.3678	4.6000e-004	0.0503	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004		0.1077	0.1077	2.8000e-004		0.1148
Unmitigated	2.3678	4.6000e-004	0.0503	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004		0.1077	0.1077	2.8000e-004		0.1148

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.2874					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.0757					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.6800e-003	4.6000e-004	0.0503	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004		0.1077	0.1077	2.8000e-004		0.1148
Total	**2.3678**	**4.6000e-004**	**0.0503**	**0.0000**		**1.8000e-004**	**1.8000e-004**		**1.8000e-004**	**1.8000e-004**		**0.1077**	**0.1077**	**2.8000e-004**		**0.1148**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.2874					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.0757					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.6800e-003	4.6000e-004	0.0503	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004		0.1077	0.1077	2.8000e-004		0.1148
Total	**2.3678**	**4.6000e-004**	**0.0503**	**0.0000**		**1.8000e-004**	**1.8000e-004**		**1.8000e-004**	**1.8000e-004**		**0.1077**	**0.1077**	**2.8000e-004**		**0.1148**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Pinole Square (Proposed) - Unmitigated

Bay Area AQMD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	384.00	Space	3.46	153,600.00	0
Fast Food Restaurant with Drive Thru	3.00	1000sqft	0.07	3,005.00	0
Convenience Market With Gas Pumps	16.00	Pump	0.05	2,258.80	0
Regional Shopping Center	89.19	1000sqft	8.31	89,190.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 64

Climate Zone 5 **Operational Year** 2022

Utility Company Pacific Gas & Electric Company

CO2 Intensity (lb/MWhr) 269.5 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Intensity factor for CO2 adjusted based on PG&E’s RPS reductions

Land Use - Acreage updated per Applicant-provided information

Construction Phase - Applicant provided

Demolition - Applicant provided

Grading - Applicant provided

Vehicle Trips - Per Transportation Impact Study

Energy Use -

Mobile Land Use Mitigation - Applicant provided

Energy Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	20.00	26.00
tblConstructionPhase	NumDays	10.00	13.00
tblConstructionPhase	NumDays	30.00	39.00
tblConstructionPhase	NumDays	20.00	26.00
tblConstructionPhase	NumDays	300.00	390.00
tblConstructionPhase	NumDays	20.00	380.00
tblConstructionPhase	PhaseEndDate	2/28/2020	3/9/2020
tblConstructionPhase	PhaseEndDate	3/13/2020	3/26/2020
tblConstructionPhase	PhaseEndDate	4/24/2020	5/20/2020
tblConstructionPhase	PhaseEndDate	7/16/2021	6/25/2020
tblConstructionPhase	PhaseEndDate	6/18/2021	12/23/2021
tblConstructionPhase	PhaseEndDate	8/13/2021	12/23/2021
tblConstructionPhase	PhaseStartDate	2/29/2020	3/10/2020
tblConstructionPhase	PhaseStartDate	3/14/2020	3/27/2020
tblConstructionPhase	PhaseStartDate	6/19/2021	5/21/2020
tblConstructionPhase	PhaseStartDate	4/25/2020	6/26/2020

tblConstructionPhase	PhaseStartDate	7/17/2021	7/10/2020
tblGrading	AcresOfGrading	97.50	11.89
tblGrading	MaterialExported	0.00	2,215.00
tblGrading	MaterialImported	0.00	550.00
tblLandUse	LandUseSquareFeet	3,000.00	3,005.00
tblLandUse	LotAcreage	2.05	8.31
tblProjectCharacteristics	CO2IntensityFactor	641.35	269.5
tblVehicleTrips	ST_TR	204.47	86.00
tblVehicleTrips	ST_TR	722.03	423.29
tblVehicleTrips	ST_TR	49.97	62.36
tblVehicleTrips	SU_TR	166.88	86.00
tblVehicleTrips	SU_TR	542.72	423.29
tblVehicleTrips	SU_TR	25.24	62.36
tblVehicleTrips	WD_TR	542.60	86.00
tblVehicleTrips	WD_TR	496.12	423.29
tblVehicleTrips	WD_TR	42.70	62.36

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	5.7055	52.8532	33.0060	0.0705	18.2141	2.1984	20.4125	9.9699	2.0225	11.9924	0.0000	6,899.198 3	6,899.198 3	1.9858	0.0000	6,948.842 6
2021	5.4036	23.4970	22.1610	0.0491	1.2140	1.0681	2.2821	0.3283	1.0099	1.3382	0.0000	4,821.155 0	4,821.155 0	0.7143	0.0000	4,839.012 6
Maximum	**5.7055**	**52.8532**	**33.0060**	**0.0705**	**18.2141**	**2.1984**	**20.4125**	**9.9699**	**2.0225**	**11.9924**	**0.0000**	**6,899.198 3**	**6,899.198 3**	**1.9858**	**0.0000**	**6,948.842 6**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	5.7055	52.8532	33.0060	0.0705	18.2141	2.1984	20.4125	9.9699	2.0225	11.9924	0.0000	6,899.198 3	6,899.198 3	1.9858	0.0000	6,948.842 6
2021	5.4036	23.4970	22.1610	0.0491	1.2140	1.0681	2.2821	0.3283	1.0099	1.3382	0.0000	4,821.155 0	4,821.155 0	0.7143	0.0000	4,839.012 6
Maximum	**5.7055**	**52.8532**	**33.0060**	**0.0705**	**18.2141**	**2.1984**	**20.4125**	**9.9699**	**2.0225**	**11.9924**	**0.0000**	**6,899.198 3**	**6,899.198 3**	**1.9858**	**0.0000**	**6,948.842 6**

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

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.3678	4.6000e-004	0.0503	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004		0.1077	0.1077	2.8000e-004		0.1148
Energy	0.0273	0.2485	0.2088	1.4900e-003		0.0189	0.0189		0.0189	0.0189		298.2318	298.2318	5.7200e-003	5.4700e-003	300.0040
Mobile	9.5597	44.4223	96.4207	0.2857	24.8065	0.2714	25.0778	6.6369	0.2539	6.8908		28,921.9317	28,921.9317	1.2711		28,953.7088
Total	**11.9549**	**44.6713**	**96.6798**	**0.2872**	**24.8065**	**0.2904**	**25.0969**	**6.6369**	**0.2730**	**6.9099**		**29,220.2712**	**29,220.2712**	**1.2771**	**5.4700e-003**	**29,253.8277**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.3678	4.6000e-004	0.0503	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004		0.1077	0.1077	2.8000e-004		0.1148
Energy	0.0231	0.2101	0.1765	1.2600e-003		0.0160	0.0160		0.0160	0.0160		252.1512	252.1512	4.8300e-003	4.6200e-003	253.6496
Mobile	9.2676	42.2249	89.7587	0.2557	21.8793	0.2453	22.1246	5.8537	0.2295	6.0833		25,887.7221	25,887.7221	1.1861		25,917.3740
Total	**11.6585**	**42.4355**	**89.9855**	**0.2570**	**21.8793**	**0.2615**	**22.1408**	**5.8537**	**0.2457**	**6.0994**		**26,139.9810**	**26,139.9810**	**1.1912**	**4.6200e-003**	**26,171.1384**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	2.48	5.00	6.92	10.52	11.80	9.96	11.78	11.80	10.01	11.73	0.00	10.54	10.54	6.73	15.54	10.54

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	2/3/2020	3/9/2020	5	26	
2	Site Preparation	Site Preparation	3/10/2020	3/26/2020	5	13	
3	Grading	Grading	3/27/2020	5/20/2020	5	39	
4	Building Construction	Building Construction	6/26/2020	12/23/2021	5	390	
5	Paving	Paving	5/21/2020	6/25/2020	5	26	
6	Architectural Coating	Architectural Coating	7/10/2020	12/23/2021	5	380	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 11.89

Acres of Paving: 3.46

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 141,681; Non-Residential Outdoor: 47,227; Striped Parking Area: 9,216 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48
Grading	Scrapers	2	8.00	367	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	342.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	346.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	95.00	41.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	19.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.8508	0.0000	2.8508	0.4316	0.0000	0.4316			0.0000			0.0000
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419		3,747.704 9	3,747.704 9	1.0580		3,774.153 6
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**2.8508**	**1.6587**	**4.5095**	**0.4316**	**1.5419**	**1.9735**		**3,747.704 9**	**3,747.704 9**	**1.0580**		**3,774.153 6**

3.2 Demolition - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1115	3.8603	0.8062	0.0103	0.2298	0.0125	0.2423	0.0630	0.0120	0.0750		1,100.310 8	1,100.310 8	0.0588		1,101.780 7
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0552	0.0390	0.3780	1.1400e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		113.4098	113.4098	2.7700e-003		113.4792
Total	**0.1667**	**3.8993**	**1.1841**	**0.0114**	**0.3530**	**0.0133**	**0.3664**	**0.0957**	**0.0127**	**0.1084**		**1,213.720 6**	**1,213.720 6**	**0.0616**		**1,215.259 9**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.8508	0.0000	2.8508	0.4316	0.0000	0.4316			0.0000			0.0000
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419	0.0000	3,747.704 9	3,747.704 9	1.0580		3,774.153 6
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**2.8508**	**1.6587**	**4.5095**	**0.4316**	**1.5419**	**1.9735**	**0.0000**	**3,747.704 9**	**3,747.704 9**	**1.0580**		**3,774.153 6**

3.2 Demolition - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1115	3.8603	0.8062	0.0103	0.2298	0.0125	0.2423	0.0630	0.0120	0.0750		1,100.3108	1,100.3108	0.0588		1,101.7807
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0552	0.0390	0.3780	1.1400e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		113.4098	113.4098	2.7700e-003		113.4792
Total	**0.1667**	**3.8993**	**1.1841**	**0.0114**	**0.3530**	**0.0133**	**0.3664**	**0.0957**	**0.0127**	**0.1084**		**1,213.7206**	**1,213.7206**	**0.0616**		**1,215.2599**

3.3 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216		3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0663**	**2.1974**	**20.2637**	**9.9307**	**2.0216**	**11.9523**		**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

3.3 Site Preparation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0662	0.0468	0.4536	1.3700e-003	0.1479	9.6000e-004	0.1488	0.0392	8.8000e-004	0.0401		136.0918	136.0918	3.3300e-003		136.1750
Total	**0.0662**	**0.0468**	**0.4536**	**1.3700e-003**	**0.1479**	**9.6000e-004**	**0.1488**	**0.0392**	**8.8000e-004**	**0.0401**		**136.0918**	**136.0918**	**3.3300e-003**		**136.1750**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216	0.0000	3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0663**	**2.1974**	**20.2637**	**9.9307**	**2.0216**	**11.9523**	**0.0000**	**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

3.3 Site Preparation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0662	0.0468	0.4536	1.3700e-003	0.1479	9.6000e-004	0.1488	0.0392	8.8000e-004	0.0401		136.0918	136.0918	3.3300e-003		136.1750
Total	**0.0662**	**0.0468**	**0.4536**	**1.3700e-003**	**0.1479**	**9.6000e-004**	**0.1488**	**0.0392**	**8.8000e-004**	**0.0401**		**136.0918**	**136.0918**	**3.3300e-003**		**136.1750**

3.4 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.3534	0.0000	6.3534	3.3464	0.0000	3.3464			0.0000			0.0000
Off-Road	4.4501	50.1975	31.9583	0.0620		2.1739	2.1739		2.0000	2.0000		6,005.865 3	6,005.865 3	1.9424		6,054.425 7
Total	**4.4501**	**50.1975**	**31.9583**	**0.0620**	**6.3534**	**2.1739**	**8.5273**	**3.3464**	**2.0000**	**5.3463**		**6,005.865 3**	**6,005.865 3**	**1.9424**		**6,054.425 7**

3.4 Grading - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0752	2.6036	0.5437	6.9400e-003	0.1550	8.4500e-003	0.1634	0.0425	8.0900e-003	0.0506		742.1199	742.1199	0.0397		743.1114
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0735	0.0520	0.5040	1.5200e-003	0.1643	1.0600e-003	0.1654	0.0436	9.8000e-004	0.0446		151.2131	151.2131	3.7000e-003		151.3055
Total	**0.1487**	**2.6556**	**1.0477**	**8.4600e-003**	**0.3193**	**9.5100e-003**	**0.3288**	**0.0861**	**9.0700e-003**	**0.0951**		**893.3330**	**893.3330**	**0.0434**		**894.4169**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.3534	0.0000	6.3534	3.3464	0.0000	3.3464			0.0000			0.0000
Off-Road	4.4501	50.1975	31.9583	0.0620		2.1739	2.1739		2.0000	2.0000	0.0000	6,005.8653	6,005.8653	1.9424		6,054.4257
Total	**4.4501**	**50.1975**	**31.9583**	**0.0620**	**6.3534**	**2.1739**	**8.5273**	**3.3464**	**2.0000**	**5.3463**	**0.0000**	**6,005.8653**	**6,005.8653**	**1.9424**		**6,054.4257**

3.4 Grading - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0752	2.6036	0.5437	6.9400e-003	0.1550	8.4500e-003	0.1634	0.0425	8.0900e-003	0.0506		742.1199	742.1199	0.0397		743.1114
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0735	0.0520	0.5040	1.5200e-003	0.1643	1.0600e-003	0.1654	0.0436	9.8000e-004	0.0446		151.2131	151.2131	3.7000e-003		151.3055
Total	**0.1487**	**2.6556**	**1.0477**	**8.4600e-003**	**0.3193**	**9.5100e-003**	**0.3288**	**0.0861**	**9.0700e-003**	**0.0951**		**893.3330**	**893.3330**	**0.0434**		**894.4169**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.0631	2,553.0631	0.6229		2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**		**2,553.0631**	**2,553.0631**	**0.6229**		**2,568.6345**

3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1636	4.7247	1.2751	0.0110	0.2775	0.0233	0.3008	0.0799	0.0223	0.1022		1,165.741 7	1,165.741 7	0.0637		1,167.334 3
Worker	0.3493	0.2470	2.3939	7.2100e-003	0.7804	5.0500e-003	0.7855	0.2070	4.6600e-003	0.2117		718.2621	718.2621	0.0176		718.7013
Total	**0.5128**	**4.9717**	**3.6690**	**0.0182**	**1.0579**	**0.0283**	**1.0863**	**0.2869**	**0.0269**	**0.3138**		**1,884.003 8**	**1,884.003 8**	**0.0813**		**1,886.035 7**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.063 1	2,553.063 1	0.6229		2,568.634 5
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**	**0.0000**	**2,553.063 1**	**2,553.063 1**	**0.6229**		**2,568.634 5**

3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1636	4.7247	1.2751	0.0110	0.2775	0.0233	0.3008	0.0799	0.0223	0.1022		1,165.741 7	1,165.741 7	0.0637		1,167.334 3
Worker	0.3493	0.2470	2.3939	7.2100e-003	0.7804	5.0500e-003	0.7855	0.2070	4.6600e-003	0.2117		718.2621	718.2621	0.0176		718.7013
Total	**0.5128**	**4.9717**	**3.6690**	**0.0182**	**1.0579**	**0.0283**	**1.0863**	**0.2869**	**0.0269**	**0.3138**		**1,884.003 8**	**1,884.003 8**	**0.0813**		**1,886.035 7**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013		2,553.363 9	2,553.363 9	0.6160		2,568.764 3
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**		**2,553.363 9**	**2,553.363 9**	**0.6160**		**2,568.764 3**

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1347	4.2734	1.1484	0.0109	0.2775	9.5000e-003	0.2870	0.0799	9.0800e-003	0.0890		1,154.6713	1,154.6713	0.0602		1,156.1752
Worker	0.3236	0.2205	2.1832	6.9500e-003	0.7804	4.9100e-003	0.7853	0.2070	4.5200e-003	0.2115		693.0598	693.0598	0.0157		693.4519
Total	**0.4583**	**4.4939**	**3.3316**	**0.0179**	**1.0579**	**0.0144**	**1.0723**	**0.2869**	**0.0136**	**0.3005**		**1,847.7311**	**1,847.7311**	**0.0758**		**1,849.6271**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013	0.0000	2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**	**0.0000**	**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1347	4.2734	1.1484	0.0109	0.2775	9.5000e-003	0.2870	0.0799	9.0800e-003	0.0890		1,154.6713	1,154.6713	0.0602		1,156.1752
Worker	0.3236	0.2205	2.1832	6.9500e-003	0.7804	4.9100e-003	0.7853	0.2070	4.5200e-003	0.2115		693.0598	693.0598	0.0157		693.4519
Total	**0.4583**	**4.4939**	**3.3316**	**0.0179**	**1.0579**	**0.0144**	**1.0723**	**0.2869**	**0.0136**	**0.3005**		**1,847.7311**	**1,847.7311**	**0.0758**		**1,849.6271**

3.6 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926		2,207.7334	2,207.7334	0.7140		2,225.5841
Paving	0.3487					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.7052**	**14.0656**	**14.6521**	**0.0228**		**0.7528**	**0.7528**		**0.6926**	**0.6926**		**2,207.7334**	**2,207.7334**	**0.7140**		**2,225.5841**

3.6 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0552	0.0390	0.3780	1.1400e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		113.4098	113.4098	2.7700e-003		113.4792
Total	**0.0552**	**0.0390**	**0.3780**	**1.1400e-003**	**0.1232**	**8.0000e-004**	**0.1240**	**0.0327**	**7.4000e-004**	**0.0334**		**113.4098**	**113.4098**	**2.7700e-003**		**113.4792**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926	0.0000	2,207.7334	2,207.7334	0.7140		2,225.5841
Paving	0.3487					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.7052**	**14.0656**	**14.6521**	**0.0228**		**0.7528**	**0.7528**		**0.6926**	**0.6926**	**0.0000**	**2,207.7334**	**2,207.7334**	**0.7140**		**2,225.5841**

3.6 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0552	0.0390	0.3780	1.1400e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		113.4098	113.4098	2.7700e-003		113.4792
Total	**0.0552**	**0.0390**	**0.3780**	**1.1400e-003**	**0.1232**	**8.0000e-004**	**0.1240**	**0.0327**	**7.4000e-004**	**0.0334**		**113.4098**	**113.4098**	**2.7700e-003**		**113.4792**

3.7 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	2.7608					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	**3.0030**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.7 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0699	0.0494	0.4788	1.4400e-003	0.1561	1.0100e-003	0.1571	0.0414	9.3000e-004	0.0423		143.6524	143.6524	3.5100e-003		143.7403
Total	**0.0699**	**0.0494**	**0.4788**	**1.4400e-003**	**0.1561**	**1.0100e-003**	**0.1571**	**0.0414**	**9.3000e-004**	**0.0423**		**143.6524**	**143.6524**	**3.5100e-003**		**143.7403**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	2.7608					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928
Total	**3.0030**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**	**0.0000**	**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.7 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0699	0.0494	0.4788	1.4400e-003	0.1561	1.0100e-003	0.1571	0.0414	9.3000e-004	0.0423		143.6524	143.6524	3.5100e-003		143.7403
Total	**0.0699**	**0.0494**	**0.4788**	**1.4400e-003**	**0.1561**	**1.0100e-003**	**0.1571**	**0.0414**	**9.3000e-004**	**0.0423**		**143.6524**	**143.6524**	**3.5100e-003**		**143.7403**

3.7 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	2.7608					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941		281.4481	281.4481	0.0193		281.9309
Total	**2.9797**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**		**281.4481**	**281.4481**	**0.0193**		**281.9309**

3.7 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0647	0.0441	0.4366	1.3900e-003	0.1561	9.8000e-004	0.1571	0.0414	9.0000e-004	0.0423		138.6120	138.6120	3.1400e-003		138.6904
Total	**0.0647**	**0.0441**	**0.4366**	**1.3900e-003**	**0.1561**	**9.8000e-004**	**0.1571**	**0.0414**	**9.0000e-004**	**0.0423**		**138.6120**	**138.6120**	**3.1400e-003**		**138.6904**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	2.7608					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941	0.0000	281.4481	281.4481	0.0193		281.9309
Total	**2.9797**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**	**0.0000**	**281.4481**	**281.4481**	**0.0193**		**281.9309**

3.7 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0647	0.0441	0.4366	1.3900e-003	0.1561	9.8000e-004	0.1571	0.0414	9.0000e-004	0.0423		138.6120	138.6120	3.1400e-003		138.6904
Total	**0.0647**	**0.0441**	**0.4366**	**1.3900e-003**	**0.1561**	**9.8000e-004**	**0.1571**	**0.0414**	**9.0000e-004**	**0.0423**		**138.6120**	**138.6120**	**3.1400e-003**		**138.6904**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Diversity

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	9.2676	42.2249	89.7587	0.2557	21.8793	0.2453	22.1246	5.8537	0.2295	6.0833		25,887.7221	25,887.7221	1.1861		25,917.3740
Unmitigated	9.5597	44.4223	96.4207	0.2857	24.8065	0.2714	25.0778	6.6369	0.2539	6.8908		28,921.9317	28,921.9317	1.2711		28,953.7088

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Convenience Market With Gas Pumps	1,376.00	1,376.00	1376.00	738,092	650,997
Fast Food Restaurant with Drive Thru	1,269.87	1,269.87	1269.87	1,186,471	1,046,468
Parking Lot	0.00	0.00	0.00		
Regional Shopping Center	5,561.89	5,561.89	5561.89	9,751,686	8,600,987
Total	8,207.76	8,207.76	8,207.76	11,676,249	10,298,452

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Convenience Market With Gas	9.50	7.30	7.30	0.80	80.20	19.00	14	21	65
Fast Food Restaurant with Drive	9.50	7.30	7.30	2.20	78.80	19.00	29	21	50
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Convenience Market With Gas Pumps	0.576985	0.039376	0.193723	0.112069	0.016317	0.005358	0.017943	0.025814	0.002614	0.002274	0.005874	0.000887	0.000768
Fast Food Restaurant with Drive Thru	0.576985	0.039376	0.193723	0.112069	0.016317	0.005358	0.017943	0.025814	0.002614	0.002274	0.005874	0.000887	0.000768
Parking Lot	0.576985	0.039376	0.193723	0.112069	0.016317	0.005358	0.017943	0.025814	0.002614	0.002274	0.005874	0.000887	0.000768
Regional Shopping Center	0.576985	0.039376	0.193723	0.112069	0.016317	0.005358	0.017943	0.025814	0.002614	0.002274	0.005874	0.000887	0.000768

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0231	0.2101	0.1765	1.2600e-003		0.0160	0.0160		0.0160	0.0160		252.1512	252.1512	4.8300e-003	4.6200e-003	253.6496
NaturalGas Unmitigated	0.0273	0.2485	0.2088	1.4900e-003		0.0189	0.0189		0.0189	0.0189		298.2318	298.2318	5.7200e-003	5.4700e-003	300.0040

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Convenience Market With Gas Pumps	28.4671	3.1000e-004	2.7900e-003	2.3400e-003	2.0000e-005		2.1000e-004	2.1000e-004		2.1000e-004	2.1000e-004		3.3491	3.3491	6.0000e-005	6.0000e-005	3.3690
Fast Food Restaurant with Drive Thru	1382.46	0.0149	0.1355	0.1139	8.1000e-004		0.0103	0.0103		0.0103	0.0103		162.6429	162.6429	3.1200e-003	2.9800e-003	163.6094
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	1124.04	0.0121	0.1102	0.0926	6.6000e-004		8.3800e-003	8.3800e-003		8.3800e-003	8.3800e-003		132.2398	132.2398	2.5300e-003	2.4200e-003	133.0256
Total		**0.0273**	**0.2485**	**0.2088**	**1.4900e-003**		**0.0189**	**0.0189**		**0.0189**	**0.0189**		**298.2318**	**298.2318**	**5.7100e-003**	**5.4600e-003**	**300.0040**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Convenience Market With Gas Pumps	0.0212265	2.3000e-004	2.0800e-003	1.7500e-003	1.0000e-005		1.6000e-004	1.6000e-004		1.6000e-004	1.6000e-004		2.4972	2.4972	5.0000e-005	5.0000e-005	2.5121
Fast Food Restaurant with Drive Thru	1.28392	0.0139	0.1259	0.1057	7.6000e-004		9.5700e-003	9.5700e-003		9.5700e-003	9.5700e-003		151.0491	151.0491	2.9000e-003	2.7700e-003	151.9467
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	0.838142	9.0400e-003	0.0822	0.0690	4.9000e-004		6.2400e-003	6.2400e-003		6.2400e-003	6.2400e-003		98.6049	98.6049	1.8900e-003	1.8100e-003	99.1909
Total		**0.0231**	**0.2101**	**0.1765**	**1.2600e-003**		**0.0160**	**0.0160**		**0.0160**	**0.0160**		**252.1512**	**252.1512**	**4.8400e-003**	**4.6300e-003**	**253.6496**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	2.3678	4.6000e-004	0.0503	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004		0.1077	0.1077	2.8000e-004		0.1148
Unmitigated	2.3678	4.6000e-004	0.0503	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004		0.1077	0.1077	2.8000e-004		0.1148

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.2874					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.0757					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.6800e-003	4.6000e-004	0.0503	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004		0.1077	0.1077	2.8000e-004		0.1148
Total	**2.3678**	**4.6000e-004**	**0.0503**	**0.0000**		**1.8000e-004**	**1.8000e-004**		**1.8000e-004**	**1.8000e-004**		**0.1077**	**0.1077**	**2.8000e-004**		**0.1148**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.2874					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.0757					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.6800e-003	4.6000e-004	0.0503	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004		0.1077	0.1077	2.8000e-004		0.1148
Total	**2.3678**	**4.6000e-004**	**0.0503**	**0.0000**		**1.8000e-004**	**1.8000e-004**		**1.8000e-004**	**1.8000e-004**		**0.1077**	**0.1077**	**2.8000e-004**		**0.1148**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Pinole Square (Proposed) - Unmitigated

Bay Area AQMD Air District, Mitigation Report

Construction Mitigation Summary

Phase	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Architectural Coating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Construction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Demolition	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Site Preparation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

OFFROAD Equipment Mitigation

Equipment Type	Fuel Type	Tier	Number Mitigated	Total Number of Equipment	DPF	Oxidation Catalyst
Air Compressors	Diesel	No Change	0	1	No Change	0.00
Concrete/Industrial Saws	Diesel	No Change	0	1	No Change	0.00
Cranes	Diesel	No Change	0	1	No Change	0.00
Excavators	Diesel	No Change	0	5	No Change	0.00
Forklifts	Diesel	No Change	0	3	No Change	0.00
Generator Sets	Diesel	No Change	0	1	No Change	0.00
Graders	Diesel	No Change	0	1	No Change	0.00
Pavers	Diesel	No Change	0	2	No Change	0.00
Paving Equipment	Diesel	No Change	0	2	No Change	0.00
Rollers	Diesel	No Change	0	2	No Change	0.00
Rubber Tired Dozers	Diesel	No Change	0	6	No Change	0.00
Tractors/Loaders/Backhoes	Diesel	No Change	0	9	No Change	0.00
Welders	Diesel	No Change	0	1	No Change	0.00
Scrapers	Diesel	No Change	0	2	No Change	0.00

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	Unmitigated tons/yr						Unmitigated mt/yr					
Air Compressors	4.30500E-002	2.99910E-001	3.46200E-001	5.60000E-004	1.89300E-002	1.89300E-002	0.00000E+000	4.85118E+001	4.85118E+001	3.47000E-003	0.00000E+000	4.85986E+001
Concrete/Industrial Saws	5.44000E-003	4.28800E-002	4.79300E-002	8.00000E-005	2.58000E-003	2.58000E-003	0.00000E+000	6.98953E+000	6.98953E+000	4.40000E-004	0.00000E+000	7.00060E+000
Cranes	7.28400E-002	8.59440E-001	3.46150E-001	9.80000E-004	3.50900E-002	3.22900E-002	0.00000E+000	8.64890E+001	8.64890E+001	2.79700E-002	0.00000E+000	8.71883E+001
Excavators	1.91100E-002	1.88190E-001	2.54890E-001	4.00000E-004	9.12000E-003	8.39000E-003	0.00000E+000	3.53886E+001	3.53886E+001	1.14500E-002	0.00000E+000	3.56747E+001
Forklifts	7.86300E-002	7.13760E-001	6.85710E-001	8.90000E-004	5.15900E-002	4.74600E-002	0.00000E+000	7.85604E+001	7.85604E+001	2.54100E-002	0.00000E+000	7.91956E+001
Generator Sets	7.25000E-002	6.38490E-001	7.19930E-001	1.28000E-003	3.46300E-002	3.46300E-002	0.00000E+000	1.10215E+002	1.10215E+002	5.83000E-003	0.00000E+000	1.10361E+002
Graders	9.28000E-003	1.23350E-001	3.53800E-002	1.30000E-004	3.94000E-003	3.63000E-003	0.00000E+000	1.13698E+001	1.13698E+001	3.68000E-003	0.00000E+000	1.14617E+001
Pavers	6.83000E-003	7.30700E-002	7.53600E-002	1.20000E-004	3.55000E-003	3.27000E-003	0.00000E+000	1.07384E+001	1.07384E+001	3.47000E-003	0.00000E+000	1.08252E+001
Paving Equipment	5.39000E-003	5.56800E-002	6.58900E-002	1.10000E-004	2.78000E-003	2.56000E-003	0.00000E+000	9.30566E+000	9.30566E+000	3.01000E-003	0.00000E+000	9.38090E+000
Rollers	5.41000E-003	5.41100E-002	4.92300E-002	7.00000E-005	3.45000E-003	3.17000E-003	0.00000E+000	5.99262E+000	5.99262E+000	1.94000E-003	0.00000E+000	6.04107E+000
Rubber Tired Dozers	7.01700E-002	7.36600E-001	2.68550E-001	5.50000E-004	3.60700E-002	3.31900E-002	0.00000E+000	4.87859E+001	4.87859E+001	1.57800E-002	0.00000E+000	4.91804E+001
Scrapers	3.87200E-002	4.58330E-001	2.90890E-001	5.90000E-004	1.78800E-002	1.64500E-002	0.00000E+000	5.19033E+001	5.19033E+001	1.67900E-002	0.00000E+000	5.23230E+001
Tractors/Loaders/Backhoes	1.13420E-001	1.14434E+000	1.30859E+000	1.79000E-003	6.96500E-002	6.40800E-002	0.00000E+000	1.57442E+002	1.57442E+002	5.09200E-002	0.00000E+000	1.58715E+002
Welders	6.16800E-002	2.98450E-001	3.38420E-001	5.00000E-004	1.53100E-002	1.53100E-002	0.00000E+000	3.67030E+001	3.67030E+001	5.00000E-003	0.00000E+000	3.68281E+001

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	Mitigated tons/yr						Mitigated mt/yr					
Air Compressors	4.30500E-002	2.99910E-001	3.46200E-001	5.60000E-004	1.89300E-002	1.89300E-002	0.00000E+000	4.85118E+001	4.85118E+001	3.47000E-003	0.00000E+000	4.85985E+001
Concrete/Industrial Saws	5.44000E-003	4.28800E-002	4.79300E-002	8.00000E-005	2.58000E-003	2.58000E-003	0.00000E+000	6.98952E+000	6.98952E+000	4.40000E-004	0.00000E+000	7.00059E+000
Cranes	7.28400E-002	8.59440E-001	3.46150E-001	9.80000E-004	3.50900E-002	3.22900E-002	0.00000E+000	8.64889E+001	8.64889E+001	2.79700E-002	0.00000E+000	8.71882E+001
Excavators	1.91100E-002	1.88190E-001	2.54890E-001	4.00000E-004	9.12000E-003	8.39000E-003	0.00000E+000	3.53885E+001	3.53885E+001	1.14500E-002	0.00000E+000	3.56747E+001
Forklifts	7.86300E-002	7.13760E-001	6.85710E-001	8.90000E-004	5.15900E-002	4.74600E-002	0.00000E+000	7.85603E+001	7.85603E+001	2.54100E-002	0.00000E+000	7.91955E+001
Generator Sets	7.25000E-002	6.38490E-001	7.19920E-001	1.28000E-003	3.46300E-002	3.46300E-002	0.00000E+000	1.10215E+002	1.10215E+002	5.83000E-003	0.00000E+000	1.10361E+002
Graders	9.28000E-003	1.23350E-001	3.53800E-002	1.30000E-004	3.94000E-003	3.63000E-003	0.00000E+000	1.13698E+001	1.13698E+001	3.68000E-003	0.00000E+000	1.14617E+001
Pavers	6.83000E-003	7.30700E-002	7.53600E-002	1.20000E-004	3.55000E-003	3.27000E-003	0.00000E+000	1.07384E+001	1.07384E+001	3.47000E-003	0.00000E+000	1.08252E+001
Paving Equipment	5.39000E-003	5.56800E-002	6.58900E-002	1.10000E-004	2.78000E-003	2.56000E-003	0.00000E+000	9.30565E+000	9.30565E+000	3.01000E-003	0.00000E+000	9.38089E+000
Rollers	5.41000E-003	5.41100E-002	4.92300E-002	7.00000E-005	3.45000E-003	3.17000E-003	0.00000E+000	5.99261E+000	5.99261E+000	1.94000E-003	0.00000E+000	6.04106E+000
Rubber Tired Dozers	7.01700E-002	7.36600E-001	2.68550E-001	5.50000E-004	3.60700E-002	3.31900E-002	0.00000E+000	4.87859E+001	4.87859E+001	1.57800E-002	0.00000E+000	4.91803E+001
Scrapers	3.87200E-002	4.58330E-001	2.90890E-001	5.90000E-004	1.78800E-002	1.64500E-002	0.00000E+000	5.19032E+001	5.19032E+001	1.67900E-002	0.00000E+000	5.23229E+001
Tractors/Loaders/Backhoes	1.13420E-001	1.14434E+000	1.30859E+000	1.79000E-003	6.96500E-002	6.40800E-002	0.00000E+000	1.57442E+002	1.57442E+002	5.09200E-002	0.00000E+000	1.58715E+002
Welders	6.16800E-002	2.98450E-001	3.38420E-001	5.00000E-004	1.53100E-002	1.53100E-002	0.00000E+000	3.67030E+001	3.67030E+001	5.00000E-003	0.00000E+000	3.68281E+001

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Air Compressors	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.23681E-006	1.23681E-006	0.00000E+000	0.00000E+000	1.23460E-006
Concrete/Industrial Saws	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.43071E-006	1.43071E-006	0.00000E+000	0.00000E+000	1.42845E-006
Cranes	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.15622E-006	1.15622E-006	0.00000E+000	0.00000E+000	1.14694E-006
Excavators	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.13031E-006	1.13031E-006	0.00000E+000	0.00000E+000	1.12124E-006
Forklifts	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.27291E-006	1.27291E-006	0.00000E+000	0.00000E+000	1.26270E-006
Generator Sets	0.00000E+000	0.00000E+000	1.38902E-005	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.17951E-006	1.17951E-006	0.00000E+000	0.00000E+000	1.17795E-006
Graders	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	8.79526E-007	8.79526E-007	0.00000E+000	0.00000E+000	8.72472E-007
Pavers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	9.31237E-007	9.31237E-007	0.00000E+000	0.00000E+000	9.23767E-007
Paving Equipment	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.07461E-006	1.07461E-006	0.00000E+000	0.00000E+000	1.06600E-006
Rollers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.66872E-006	1.66872E-006	0.00000E+000	0.00000E+000	1.65534E-006
Rubber Tired Dozers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.22986E-006	1.22986E-006	0.00000E+000	0.00000E+000	1.22000E-006
Scrapers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.34866E-006	1.34866E-006	0.00000E+000	0.00000E+000	1.14672E-006
Tractors/Loaders/Backhoes	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.20680E-006	1.20680E-006	0.00000E+000	0.00000E+000	1.19712E-006
Welders	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.08983E-006	1.08983E-006	0.00000E+000	0.00000E+000	1.08613E-006

Fugitive Dust Mitigation

Yes/No	Mitigation Measure	Mitigation Input		Mitigation Input		Mitigation Input	
No	Soil Stabilizer for unpaved Roads	PM10 Reduction		PM2.5 Reduction			
No	Replace Ground Cover of Area Disturbed	PM10 Reduction		PM2.5 Reduction			
No	Water Exposed Area	PM10 Reduction		PM2.5 Reduction		Frequency (per day)	

No	Unpaved Road Mitigation	Moisture Content %		Vehicle Speed (mph)	0.00		
No	Clean Paved Road	% PM Reduction	0.00				

		Unmitigated		Mitigated		Percent Reduction	
Phase	Source	PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
Architectural Coating	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Architectural Coating	Roads	0.03	0.01	0.03	0.01	0.00	0.00
Building Construction	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Building Construction	Roads	0.20	0.05	0.20	0.05	0.00	0.00
Demolition	Fugitive Dust	0.04	0.01	0.04	0.01	0.00	0.00
Demolition	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Grading	Fugitive Dust	0.12	0.07	0.12	0.07	0.00	0.00
Grading	Roads	0.01	0.00	0.01	0.00	0.00	0.00
Paving	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Paving	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Site Preparation	Fugitive Dust	0.12	0.06	0.12	0.06	0.00	0.00
Site Preparation	Roads	0.00	0.00	0.00	0.00	0.00	0.00

Operational Percent Reduction Summary

Category	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Architectural Coating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electricity	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.81	5.81	5.87	5.69	5.81
Hearth	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mobile	3.00	4.81	7.33	10.44	9.65	9.68	0.00	10.43	10.43	6.94	0.00	10.43
Natural Gas	15.43	15.45	15.43	14.81	15.36	15.36	0.00	15.45	15.45	15.79	14.44	15.45
Water Indoor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Outdoor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Operational Mobile Mitigation

Project Setting: Suburban Center

Mitigation	Category	Measure	% Reduction	Input Value 1	Input Value 2	Input Value
No	Land Use	Increase Density	0.00	0.00	0.00	
Yes	Land Use	Increase Diversity	0.11	0.34		
No	Land Use	Improve Walkability Design	0.00	0.00		
No	Land Use	Improve Destination Accessibility	0.00	0.00		
No	Land Use	Increase Transit Accessibility	0.25	0.00		
No	Land Use	Integrate Below Market Rate Housing	0.00	0.00		
	Land Use	Land Use SubTotal	0.10			

Yes	Neighborhood Enhancements	Improve Pedestrian Network	2.00	Project Site and Connecting Off-Site		
No	Neighborhood Enhancements	Provide Traffic Calming Measures	0.00			
No	Neighborhood Enhancements	Implement NEV Network	0.00			
	Neighborhood Enhancements	Neighborhood Enhancements Subtotal	0.02			
Yes	Parking Policy Pricing	Limit Parking Supply	0.00	0.00		
No	Parking Policy Pricing	Unbundle Parking Costs	0.00	0.00		
No	Parking Policy Pricing	On-street Market Pricing	0.00	0.00		
	Parking Policy Pricing	Parking Policy Pricing Subtotal	0.00			
No	Transit Improvements	Provide BRT System	0.00	0.00		
No	Transit Improvements	Expand Transit Network	0.00	0.00		
No	Transit Improvements	Increase Transit Frequency	0.00		0.00	
	Transit Improvements	Transit Improvements Subtotal	0.00			
		Land Use and Site Enhancement Subtotal	0.12			
No	Commute	Implement Trip Reduction Program				
No	Commute	Transit Subsidy				
No	Commute	Implement Employee Parking "Cash Out"	4.50			
No	Commute	Workplace Parking Charge		0.00		
No	Commute	Encourage Telecommuting and Alternative Work Schedules	0.00			
No	Commute	Market Commute Trip Reduction Option	0.00			
No	Commute	Employee Vanpool/Shuttle	0.00		2.00	
No	Commute	Provide Ride Sharing Program	10.00			
	Commute	Commute Subtotal	0.00			

No	School Trip	Implement School Bus Program	0.00			
		Total VMT Reduction	0.12			

Area Mitigation

Measure Implemented	Mitigation Measure	Input Value
No	Only Natural Gas Hearth	
No	No Hearth	
No	Use Low VOC Cleaning Supplies	
No	Use Low VOC Paint (Residential Interior)	100.00
No	Use Low VOC Paint (Residential Exterior)	150.00
No	Use Low VOC Paint (Non-residential Interior)	100.00
No	Use Low VOC Paint (Non-residential Exterior)	150.00
No	Use Low VOC Paint (Parking)	150.00
No	% Electric Lawnmower	
No	% Electric Leafblower	
No	% Electric Chainsaw	

Energy Mitigation Measures

Measure Implemented	Mitigation Measure	Input Value 1	Input Value 2
Yes	Exceed Title 24	30.00	
No	Install High Efficiency Lighting		
No	On-site Renewable		

Appliance Type	Land Use Subtype	% Improvement
ClothWasher		30.00
DishWasher		15.00
Fan		50.00
Refrigerator		15.00

Water Mitigation Measures

Measure Implemented	Mitigation Measure	Input Value 1	Input Value 2
No	Apply Water Conservation on Strategy		
No	Use Reclaimed Water		
No	Use Grey Water		
No	Install low-flow bathroom faucet	32.00	
No	Install low-flow Kitchen faucet	18.00	
No	Install low-flow Toilet	20.00	
No	Install low-flow Shower	20.00	
No	Turf Reduction		
No	Use Water Efficient Irrigation Systems	6.10	
No	Water Efficient Landscape		

Solid Waste Mitigation

Mitigation Measures	Input Value

Institute Recycling and Composting Services Percent Reduction in Waste Disposed	

APPENDIX B

ARBORIST REPORT

Arborist Report

Pinole Square
Pinole, CA

PREPARED FOR:
Gates and Associates
2671 Crow Canyon Rd
San Ramon, CA 94583

PREPARED BY:
HortScience, Inc.
325 Ray Street
Pleasanton, CA 94566

October 4, 2017

HORT SCIENCE

Arborist Report
Pinole Square.
Pinole, CA

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Introduction and Overview

Gates and Associates is redeveloping Pinole Square located at 1200 – 1577 Tara Hills Drive in Pinole, CA. The property currently consists of a shopping center, associated landscapes and parking lots. HortScience, Inc. was asked to prepare an **Arborist Report** as a part as part of the application to the City of Pinole.

This report provides the following information:

1. An evaluation of the health and structural condition of the trees within the proposed project area based on a visual inspection from the ground.
2. An assessment of the trees that would be possibly preserved and removed based on the site plan provided by Gates & Associates.
3. Guidelines for tree preservation during the design, construction and maintenance phases of development.

Assessment Methods

Trees were assessed on September 26, 2017. All trees measuring 6 inches or greater (4 inches and greater for native trees) were included in the survey, as required by the City of Pinole. The assessment procedure consisted of the following steps:

1. Identifying the tree as to species;
2. Tagging each tree with an identifying number and recording its location on a map;
3. Measuring the trunk diameter at a point 54 inches above grade;
4. Evaluating the health and structural condition using a scale of 1 – 5:
   - ***5*** **-** A healthy, vigorous tree, reasonably free of signs and symptoms of disease, with good structure and form typical of the species.
   - ***4*** **-** Tree with slight decline in vigor, small amount of twig dieback, minor structural defects that could be corrected.
   - ***3*** **-** Tree with moderate vigor, moderate twig and small branch dieback, thinning of crown, poor leaf color, moderate structural defects that might be mitigated with regular care.
   - ***2*** **-** Tree in decline, epicormic growth, extensive dieback of medium to large branches, significant structural defects that cannot be abated.
   - ***1*** **-** Tree in severe decline, dieback of scaffold branches and/or trunk; most of foliage from epicormics; extensive structural defects that cannot be abated.
5. Rating the suitability for preservation as “high”, “moderate” or “low”. Suitability for preservation considers the health, age and structural condition of the tree, and its potential to remain an asset to the site for years to come.

   High: Trees with good health and structural stability that have the potential for longevity at the site.

   Moderate: Trees with somewhat declining health and/or structural defects than can be abated with treatment. The tree will require more intense management and monitoring, and may have shorter life span than those in ‘high’ category.

   Low: Trees in poor health or with significant structural defects that cannot be mitigated. Tree is expected to continue to decline, regardless of treatment. The species or individual may have characteristics that are undesirable for landscapes, and generally are unsuited for use areas.

Description of Trees

Seventy (70) trees were assessed, including 25 off-site trees, representing 10 species (Table 1). Trees appeared to be planted, not indigenous to the site. Overall, trees were in fair condition with 61 trees or 88% of trees assessed; six trees (8%) were in good condition and three (4%) trees were in poor condition. Descriptions of each tree can be found in the ***Tree Assessment Form*** and approximate locations are shown on the ***Tree Assessment Map*** (see attachments).

Table 1: Condition ratings and frequency of occurrence of trees
Pinole Square. Pinole, CA

Common Name	Scientific Name	Condition			Total
		Poor (1-2)	Fair (3)	Good (4-5)	
Blue atlas cedar	*Cedrus atlantica* 'Glauca'	2	1	-	**3**
Italian cypress	*Cupressus sempervirens*	-	2	-	**2**
Blue gum	*Eucalyptus globulus*	-	11	-	**11**
Nichol's willowleafed peppermint	*Eucalyptus nicholii*	1	25	1	**27**
Sweetgum	*Liquidambar styraciflua*	-	2	-	**2**
Olive	*Olea europaea*	-	6	-	**6**
Avocado	*Persea americana*	-	1	-	**1**
Monterey pine	*Pinus radiata*	-	12	4	**16**
Callery pear	*Pyrus calleryana*	-	1	-	**1**
Coast live oak	*Quercus agrifolia*	-	-	1	**1**
Total		**3**	**61**	**6**	**70**

The most prevalent species assessed was Nichol's willowleafed peppermint with 27 trees or 39% of the tree population. The Nichol's willowleafed peppermints ranged in maturity from juvenile to mature with trunk diameters ranging from 7 to 33 inches. One peppermint was in poor condition, and one was in good condition, with the remaining 25 trees in fair condition. The Nichol's willowleafed peppermints were some of the largest trees at the site (Photo 1). Several of the Nichol's willowleafed peppermints had been topped. Topping is the practice of removing stems of the tree leaving stubs or lateral branches that are too small to assume the role of a terminal leader. Several trees had irregular attachments, either narrow or wide which makes the attachment weaker (Photo 2, next page).

Photo 1. Tree #23 – 25 were some of the larger trees at the site.

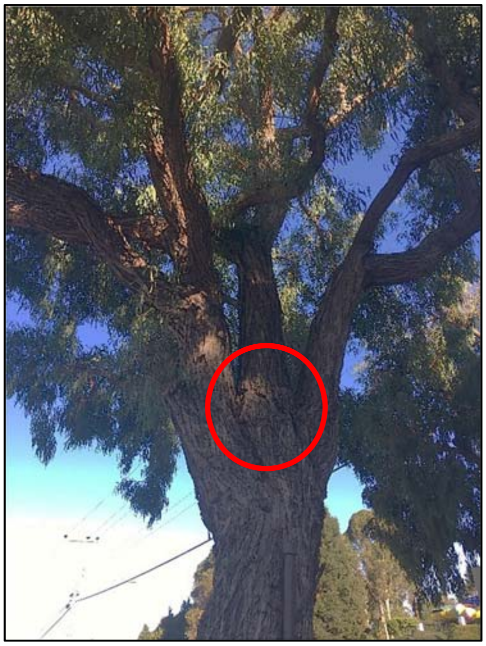


Photo 2. Tree #40 had a narrow attachment with included bark. The attachment is a weak point in the tree where failure is more likely.

Sixteen (16) Monterey pines were assessed. Twelve (12) were in fair condition, and four were in good condition. All of the Monterey pines were mature in development with trunk diameters of 21 to 34 inches. Thirteen (13) of the pines were located off-site on the western border of the property with crown overhanging the property by 5 to 28 feet. The four pines in good condition were located off-site.

All 11 blue gums assessed were located off-site along the western property line. The blue gums were mature with diameters of more than 25 inches. All of the blue gums were in fair condition. The blue gums had been topped and had thick interior growth and overhung the property by 14 feet.

All six European olives evaluated were in fair condition. Two olives had multiple trunks with diameters of 4 to 9 inches. Olives with single trunks ranged in size from 7 to 15 inches. The olives had twig and branch dieback and cavities with decay, but were still thriving (Photo 3).

Photo 3, below. Despite the basal cavity with decay olive #2 had a full crown.

Three blue atlas cedars were evaluated. Two were in poor condition and one was in fair condition. All three were semi-mature in development with trunk diameters of 10 to 13 inches. The cedars had a candelabra form (Photo 4). The two in poor condition had good structure with poor health and minimal growth.

Photo 4, left. Blue atlas cedar #8 was in fair condition with a candelabra form and a thin crown.

The remaining six trees were represented by four species:

- Two fair Italian cypresses in fair condition (#62 and 63). Both trees were juvenile in development with diameters of 6 and 10 inches.
- Two semi-mature sweetgums (#10 and 11) with diameter of 14 and 16 inches. Both trees were in fair condition.
- Avocado #4 was in fair condition and was semi-mature with codominant trunks of 6 and 11 inches.
- Callery pear #6 was juvenile in development with a trunk diameter of 7 inches. The pear was in fair condition.

The City of Pinole protects all native trees (coast live oak; madrone; buckeye; black walnut; coast redwood; big leaf maple; western redbud; California bay and toyon) with a single trunk diameter of 4 inches or greater and any non-native tree with a single trunk diameter of 18 inches or greater. Based on this definition, 42 trees are protected and cannot be removed without a permit. Of the 42 protected trees 23 are off-site. Designations for individual trees are provided in the ***Tree Assessment Form*** (see *Attachments*).

Suitability for Preservation

Before evaluating the impacts that will occur during development, it is important to consider the quality of the tree resource itself, and the potential for individual trees to function well over an extended length of time. Trees that are preserved on development sites must be carefully selected to make sure that they may survive development impacts, adapt to a new environment and perform well in the landscape.

Our goal is to identify trees that have the potential for long-term health, structural stability and longevity. For trees growing in open fields, away from areas where people and property are present, structural defects and/or poor health presents a low risk of damage or injury if they fail. However, we must be concerned about safety in use areas. Therefore, where development encroaches into existing plantings, we must consider their structural stability as well as their potential to grow and thrive in a new environment. Where development will not occur, the normal life cycles of decline, structural failure and death should be allowed to continue.

Evaluation of suitability for preservation considers several factors:

- **Tree health**
  Healthy, vigorous trees are better able to tolerate impacts such as root injury, demolition of existing structures, changes in soil grade and moisture, and soil compaction than are non-vigorous trees. For example, Nichol's willowleafed peppermint #14 was in good health with vigorous growth.

- **Structural integrity**
  Trees with significant amounts of wood decay and other structural defects that cannot be corrected are likely to fail. Such trees should not be preserved in areas where damage to people or property is likely. Nichol's willowleafed peppermint #29 is an example of such a tree with a large cavity, a lean and little live foliage.

- **Species response**
  There is a wide variation in the response of individual species to construction impacts and changes in the environment. Monterey pine and Nichol's willowleafed peppermint are both moderately tolerant of construction impacts.

- **Tree age and longevity**
  Old trees, while having significant emotional and aesthetic appeal, have limited physiological capacity to adjust to an altered environment. Young trees are better able to generate new tissue and respond to change.

- **Invasiveness**
  Species which spread across a site and displace desired vegetation are not always appropriate for retention. This is particularly true when indigenous species are displaced. The California Invasive Plant Inventory Database (http://www.cal-ipc.org/paf/) lists species identified as being invasive. Pinole is part of the Central West Floristic Province. Plum is listed as having limited invasiveness. European olive and blue gum are listed as having limited invasiveness potential.

Each tree was rated for suitability for preservation based upon its age, health, structural condition and ability to safely coexist within a development environment (Table 2). We consider trees with high suitability for preservation to be the best candidates for preservation. We do not recommend retention of trees with low suitability for preservation in areas where people or property will be present. Retention of trees with moderate suitability for preservation depends upon the intensity of proposed site changes.

Table 2: Tree suitability for preservation
Pinole Square. Pinole, CA

High	These are trees with good health and structural stability that have the potential for longevity at the site. Coast live oak #64 had high suitability for preservation.
Moderate	Trees in this category have fair health and/or structural defects that may be abated with treatment. Trees in this category require more intense management and monitoring, and may have shorter life-spans than those in the “high” category. Thirty-eight (38) trees had moderate suitability for preservation: 16 Nichol's willowleafed peppermints; 15 Monterey pines; two Italian cypresses; two sweetgums; two olives and one blue atlas cedar.
Low	Trees in this category are in poor health or have significant defects in structure that cannot be abated with treatment. These trees can be expected to decline regardless of management. The species or individual tree may possess either characteristics that are undesirable in landscape settings or be unsuited for use areas. Thirty-one (31) trees had low suitability for preservation: 11 Nichol's willowleafed peppermints; 11 blue gums; four olives; two blue atlas cedars; a Monterey pine; an avocado and a Callery pear.

Evaluation of Impacts and Recommendations for Preservation

Appropriate tree retention develops a practical match between the location and intensity of construction activities and the quality and health of trees. The ***Tree Assessment*** was the reference point for tree condition and quality. I referred to the Site Plan created by Lowney Arch to estimate impacts to trees. Tree canopy locations were included on the plan.

Plans show demolition of a few existing structures and construction of new buildings. A reconfiguration of the existing parking lot to include a new entrance and a new gas station. Proposed improvements leave little opportunity for retention of on-site trees. Tree preservation is only possible for one on-site trees and all of the off-site trees. Intensity of site improvements may require clearance pruning of off-site trees as well.

Based on my understanding of the project, 44 on-site trees are within construction areas and will be removed. Table 3 (following page) shows trees identified for removal with reasons for removal and their protection status.

All 25 off-site trees and one on-site trees (#3) can be preserved. Tree #3 is located along Tara Hills Drive at the top of a small hill. The location of the tree above the proposed construction impacts to tree #3 will be well within the tolerance of the tree.

Preservation of these trees is predicated on the construction impacts being within the tolerances of the trees and on the implementation of specific recommendations in the ***Tree Preservation Guidelines*** (page 8).

Table 3: Trees identified for removal
Pinole Square, Pinole

Tree No.	Species	Trunk Diam. (in.)	Prot. Tree	Condit. 1=poor 5=excel	Disp.	Comments
1	Olive	13	No	3	Remove	Within construction.
2	Olive	6,6,4,4	No	3	Remove	Within construction.
3	Nichol's willowleafed peppermint	31	Yes	3	Preserve	App 7' from construction.
4	Avocado	11,6	No	3	Remove	Within construction.
5	Olive	9,8,6	No	3	Remove	Within construction.
6	Callery pear	7	No	3	Remove	Within construction.
7	Nichol's willowleafed peppermint	23	Yes	3	Remove	Within construction.
8	Blue atlas cedar	10	No	3	Remove	Within construction.
9	Nichol's willowleafed peppermint	22	Yes	3	Remove	Within construction.
10	Sweetgum	14	No	3	Remove	New sidewalk.
11	Sweetgum	16	No	3	Remove	New sidewalk.
12	Monterey pine	26	Yes	3	Remove	Within construction.
13	Nichol's willowleafed peppermint	22	Yes	3	Remove	Within construction.
14	Nichol's willowleafed peppermint	29	Yes	4	Remove	Within construction.
15	Nichol's willowleafed peppermint	14	No	3	Remove	Within construction.
16	Nichol's willowleafed peppermint	11	No	3	Remove	Within construction.
17	Nichol's willowleafed peppermint	24	Yes	3	Remove	Within construction.

Tree No.	Species	Trunk Diam. (in.)	Prot. Tree	Condit. 1=poor 5=excel	Disp.	Comments
18	Nichol's willowleafed peppermint	28	Yes	3	Remove	Within construction.
19	Nichol's willowleafed peppermint	7	No	3	Remove	Within construction.
20	Nichol's willowleafed peppermint	14	No	3	Remove	Within construction.
21	Nichol's willowleafed peppermint	24	Yes	3	Remove	Within construction.
22	Nichol's willowleafed peppermint	11	No	3	Remove	Within construction.
23	Nichol's willowleafed peppermint	24	Yes	3	Remove	Within construction.
24	Nichol's willowleafed peppermint	33	Yes	3	Remove	Within construction.
25	Nichol's willowleafed peppermint	20	Yes	3	Remove	Within construction.
26	Blue atlas cedar	12	No	2	Remove	Within construction.
27	Olive	15	No	3	Remove	Within construction.
28	Blue atlas cedar	13	No	2	Remove	Within construction.
29	Nichol's willowleafed peppermint	15	No	2	Remove	Within construction.
30	Nichol's willowleafed peppermint	13	No	3	Remove	Within construction.
31	Nichol's willowleafed peppermint	15	No	3	Remove	Within construction.
32	Olive	8	No	3	Remove	Within construction.
33	Olive	7	No	3	Remove	Within construction.
34	Nichol's willowleafed peppermint	29	Yes	3	Remove	Within construction.
35	Nichol's willowleafed peppermint	25	Yes	3	Remove	Within construction.
36	Nichol's willowleafed peppermint	20	Yes	3	Remove	Within construction.
37	Nichol's willowleafed peppermint	28	Yes	3	Remove	Within construction.
38	Nichol's willowleafed peppermint	26	Yes	3	Remove	Within construction.
39	Nichol's willowleafed peppermint	16	No	3	Remove	Within construction.
40	Nichol's willowleafed peppermint	16	No	3	Remove	Within construction.
41	Nichol's willowleafed peppermint	14	No	3	Remove	Within construction.
42	Monterey pine	21	Yes	3	Remove	Within construction.
43	Monterey pine	23	Yes	3	Remove	Within construction.
44	Monterey pine	25	Yes	4	Preserve	May require pruning.
45	Monterey pine	25	Yes	4	Preserve	May require pruning.
46	Monterey pine	25	Yes	3	Preserve	May require pruning.
47	Monterey pine	15,15	No	3	Preserve	May require pruning.
48	Monterey pine	21	Yes	4	Preserve	May require pruning.
49	Monterey pine	21	Yes	3	Preserve	May require pruning.
50	Monterey pine	24	Yes	4	Preserve	May require pruning.
51	Blue gum	35	Yes	3	Preserve	May require pruning.

Tree No.	Species	Trunk Diam. (in.)	Prot. Tree	Condit. 1=poor 5=excel	Disp.	Comments
52	Blue gum	25	Yes	3	Preserve	May require pruning.
53	Blue gum	25	Yes	3	Preserve	May require pruning.
54	Blue gum	25	Yes	3	Preserve	May require pruning.
55	Blue gum	> 10	No	3	Preserve	May require pruning.
56	Blue gum	40	Yes	3	Preserve	May require pruning.
57	Blue gum	25	Yes	3	Preserve	May require pruning.
58	Blue gum	35	Yes	3	Preserve	May require pruning.
59	Blue gum	25	Yes	3	Preserve	May require pruning.
60	Blue gum	40	Yes	3	Preserve	May require pruning.
61	Blue gum	40	Yes	3	Preserve	May require pruning.
62	Italian cypress	6	No	3	Remove	Within construction.
63	Italian cypress	10	No	3	Remove	Within construction.
64	Coast live oak	10	Yes	5	Preserve	May require pruning.
65	Monterey pine	25	Yes	3	Preserve	May require pruning.
66	Monterey pine	34	Yes	3	Preserve	May require pruning.
67	Monterey pine	31	Yes	3	Preserve	May require pruning.
68	Monterey pine	22	Yes	3	Preserve	May require pruning.
69	Monterey pine	22	Yes	3	Preserve	May require pruning.
70	Monterey pine	31	Yes	3	Preserve	May require pruning.

Tree Preservation Guidelines

The goal of tree preservation is not merely tree survival during development but maintenance of tree health and beauty for many years. Trees retained on sites that are either subject to extensive injury during construction or are inadequately maintained become a liability rather than an asset. The response of individual trees will depend on the amount of excavation and grading, the care with which demolition is undertaken, and the construction methods. Coordinating any construction activity inside the **TREE PROTECTION ZONE** can minimize these impacts.

The following recommendations will help reduce impacts to trees from development and maintain and improve their health and vitality through the clearing, grading and construction phases.

Design recommendations

1. Tree #3 shall be accurately located and plotted on all construction plans along with the **TREE PROTECTION ZONE.**
2. Any changes to the plans affecting the trees should be reviewed by the Project Arborist with regard to tree impacts. These include, but are not limited to, site plans, improvement plans, utility and drainage plans, grading plans, landscape and irrigation plans, and demolition plans.
3. Plan for tree preservation by designing adequate space around trees to be preserved. This is the **TREE PROTECTION ZONE:** No grading, excavation, construction or storage of materials should occur within that zone. Route underground services including utilities, sub-drains, water or sewer around the **TREE PROTECTION ZONE**. The **TREE PROTECTION ZONES** shall be fenced at:
    a. Tree #3 - the dripline of the tree to the edge of the current parking lot and sidewalk.
    b. Off-site trees – the property line.
4. Irrigation systems must be designed so that no trenching severs roots larger than 1” in diameter will occur within the **TREE PROTECTION ZONE.**

5. Tree Preservation Guidelines prepared by the Project Arborist, which include specifications for tree protection during demolition and construction, should be included on all plans.
6. Any herbicides placed under paving materials must be safe for use around trees and labeled for that use.
7. Do not lime the subsoil within 50 feet of any tree. Lime is toxic to tree roots.
8. Ensure adequate but not excessive water is supplied to trees; in most cases, occasional irrigation will be required. Avoid directing runoff toward trees.

Pre-demolition and pre-construction treatments and recommendations

1. The demolition and construction superintendents shall meet with the Project Arborist before beginning work to review all work procedures, access routes, storage areas, and tree protection measures.
2. Tree #3 should be fenced at the dripline of the tree, to the edge of the current sidewalk and edge of parking lot. Off-site trees can be fenced at the property line, or at the retaining wall line for the duration of construction. Fences are to remain until all grading and construction is completed. Where demolition must occur close to trees, such as removing curb and pavement, install trunk protection devices such as winding silt sock wattling around trunks or stacking hay bales around tree trunks. Trunk protection are not to remain in place for longer than three weeks. Wattling is a trunk protection, and will not protect tree(s), therefore fencing should remain in place at all times.
3. Prune trees to be preserved to clean the crown of dead branches 1 inch and larger in diameter, raise canopies as needed for construction activities. All pruning shall be done by a State of California Licensed Tree Contractor (C61/D49). All pruning shall be done by Certified Arborist or Certified Tree Worker in accordance with the Best Management Practices for Pruning (International Society of Arboriculture, 2002) and adhere to the most recent editions of the American National Standard for Tree Care Operations (Z133.1) and Pruning (A300). The Project Arborist will provide pruning specifications prior to site demolition.
4. Structures and underground features to be removed within the **TREE PROTECTION ZONE** shall use equipment that will minimize damage to trees above and below ground, and operate from outside the **TREE PROTECTION ZONE**. The Project Arborist shall be on-site during all operations within the **TREE PROTECTION ZONE** to monitor demolition activity.
5. All tree work shall comply with the Migratory Bird Treaty Act as well as California Fish and Wildlife code 3503-3513 to not disturb nesting birds. To the extent feasible tree pruning and removal should be scheduled outside of the breeding season. Breeding bird surveys should be conducted prior to tree work. Qualified biologists should be involved in establishing work buffers for active nests.

Recommendations for tree protection during construction

1. Any approved grading, construction, demolition or other work within the **TREE PROTECTION ZONE** should be monitored by the Project Arborist.
2. All contractors shall conduct operations in a manner that will prevent damage to trees to be preserved.
3. Tree protection devices are to remain until all site work has been completed within the work area. Fences or other protection devices may not be relocated or removed without permission of the Project Arborist.
4. Construction trailers, traffic and storage areas must remain outside **TREE PROTECTION ZONE** at all times.

5. Any root pruning required for construction purposes shall receive the prior approval of and be supervised by the Project Arborist. Roots should be cut with a saw to provide a flat and smooth cut. Removal of roots larger than 2 inches in diameter should be avoided.
6. If roots 2" and greater in diameter are encountered during site work and must be cut to complete the construction, the Project Arborist must be consulted to evaluate effects on the health and stability of the tree and recommend treatment.
7. Spoil from trench, footing, utility or other excavation shall not be placed within the **TREE PROTECTION ZONE**, neither temporarily nor permanently.
8. All grading within the dripline of trees shall be done using the smallest equipment possible. The equipment shall operate perpendicular to the tree and operate from outside the **TREE PROTECTION ZONE**. Any modifications must be approved and monitored by the Project Arborist.
9. All trees shall be irrigated on a schedule to be determined by the Project Arborist (every 3 to 6 weeks is typical). Each irrigation shall wet the soil within the **TREE PROTECTION ZONE** to a depth of 30 inches.
10. If injury should occur to any tree during construction, it should be evaluated as soon as possible by the Project Arborist so that appropriate treatments can be applied.
11. No excess soil, chemicals, debris, equipment or other materials shall be dumped or stored within the **TREE PROTECTION ZONE.**
12. Any additional tree pruning needed for clearance during construction must be performed by a Certified Arborist and not by construction personnel.
13. Trees that accumulate a sufficient quantity of dust on their leaves, limbs and trunk as judged by the Project Arborist shall be spray-washed at the direction of the Project Arborist.

Maintenance of impacted trees

Preserved trees will experience a physical environment different from that pre-development. As a result, tree health and structural stability should be monitored. Occasional pruning, fertilization, mulch, pest management, replanting and irrigation may be required. In addition, provisions for monitoring both tree health and structural stability following construction must be made a priority. As trees age, the likelihood of failure of branches or entire trees increases; therefore, annual inspection for hazard potential is recommended.

If you have any questions regarding my observations or recommendations, please contact me.

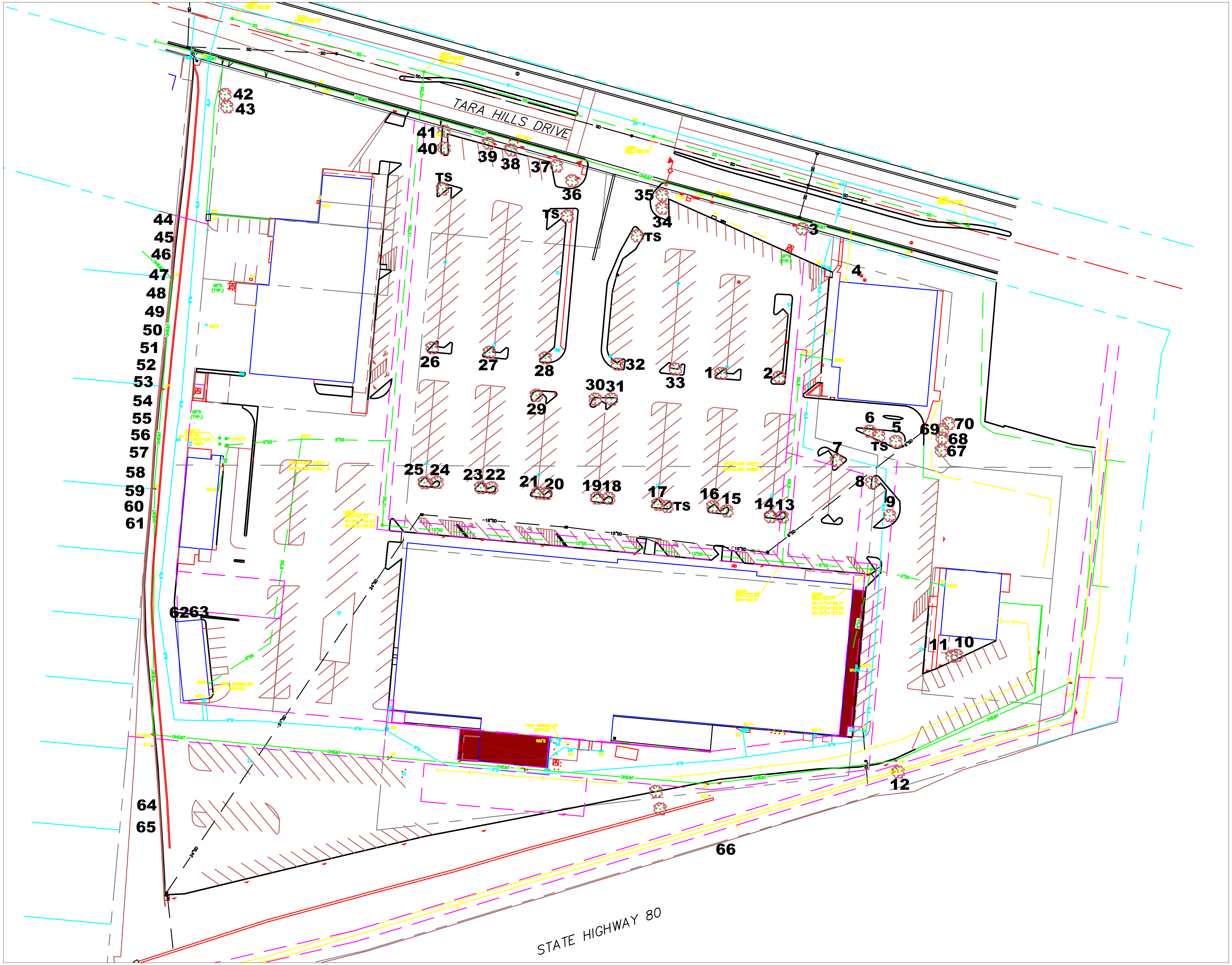
HortScience, Inc.

Darya Barar, Consulting Urban Forester
Certified Arborist WE-6757A

Exhibits

Tree Assessment Map

Tree Assessment Form



Tree Assessment Plan

Pinole Square
1200-1577 Tara Hills Dr.
Pinole, CA

Prepared for:
San Francisco Department of
Recreation and Park
San Francisco, CA

September 2017

N

No Scale

Notes:
Base map provided by:
Lowney Architects
Oakland, CA

Numbered tree locations
are approximate.

TS = Too small (tree less than 6" in diameter)
not included in this assessment.

HORT SCIENCE

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Pleasanton, CA 94566
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Tree Assessment

Pinole Square
Pinole, CA
September 26, 2017

Tree No.	Species	Trunk Diameter (in.)	Protected Tree	Condition 1=poor 5=excellent	Suitability for Preservation	Comments
1	Olive	13	No	3	Low	Southern side of tree is dead; decay in cavities.
2	Olive	6,6,4,4	No	3	Low	Multiple stems arise from 1'; full crown; some decay in basal cavity.
3	Nichol's willowleafed peppermint	31	Yes	3	Moderate	Multiple branches arise from 12&15'; full crown and growth; topped for utility line clearance; decay in attachment @12'.
4	Avocado	11,6	No	3	Low	Codominant trunks arise from base; chlorotic growth; full round crown.
5	Olive	9,8,6	No	3	Low	Multiple stems arise from 3'; base and trunk engulfed in euphorbia; full crown; some decay in basal cavity.
6	Callery pear	7	No	3	Low	High spreading crown; high live crown ratio.
7	Nichol's willowleafed peppermint	23	Yes	3	Moderate	Multiple branches arise from 12&15'; full crown and growth; slightly one sided south.
8	Blue atlas cedar	10	No	3	Moderate	Multiple stems arise from 4'; chandler shape; good growth.
9	Nichol's willowleafed peppermint	22	Yes	3	Moderate	Multiple branches arise from 15'; full crown and growth; slightly one sided south.
10	Sweetgum	14	No	3	Moderate	Multiple branches arise from 15'; full crown and growth; slightly thin.
11	Sweetgum	16	No	3	Moderate	Multiple branches arise from 3&17'; full crown and growth; slightly thin.
12	Monterey pine	26	Yes	3	Low	Codominant stems arise from 10'; branch and twig dieback; topped for utility line clearance.
13	Nichol's willowleafed peppermint	22	Yes	3	Moderate	Multiple branches arise from 10'; full crown and growth; slightly one sided south.

Tree No.	Species	Trunk Diameter (in.)	Protected Tree	Condition 1=poor 5=excellent	Suitability for Preservation	Comments
14	Nichol's willowleafed peppermint	29	Yes	4	Moderate	Multiple branches arise from 12'; full round crown.
15	Nichol's willowleafed peppermint	14	No	3	Moderate	Multiple branches arise from 12'; leaning south.
16	Nichol's willowleafed peppermint	11	No	3	Moderate	Multiple branches arise from 12'; leaning and one sided south.
17	Nichol's willowleafed peppermint	24	Yes	3	Moderate	Multiple branches arise from 12'; thin round crown.
18	Nichol's willowleafed peppermint	28	Yes	3	Moderate	Multiple branches arise from 12'; thin round crown.
19	Nichol's willowleafed peppermint	7	No	3	Moderate	Multiple branches arise from 8'; thin round crown; topped.
20	Nichol's willowleafed peppermint	14	No	3	Moderate	Multiple branches arise from 12'; thin round crown.
21	Nichol's willowleafed peppermint	24	Yes	3	Moderate	Multiple branches arise from 12'; thin round crown.
22	Nichol's willowleafed peppermint	11	No	3	Moderate	Multiple branches arise from 12'; thin round crown; leaning south.

Tree Assessment

Pinole Square
Pinole, CA
September 26, 2017

HORT SCIENCE

Tree No.	Species	Trunk Diameter (in.)	Protected Tree	Condition 1=poor 5=excellent	Suitability for Preservation	Comments
23	Nichol's willowleafed peppermint	24	Yes	3	Low	Multiple branches arise from 14'; thin round crown; tear down wound on west side; one sided south.
24	Nichol's willowleafed peppermint	33	Yes	3	Moderate	Multiple branches arise from 14'; thin round crown.
25	Nichol's willowleafed peppermint	20	Yes	3	Low	Codominant trunks arise from 10'; suppressed; one sided south.
26	Blue atlas cedar	12	No	2	Low	Multiple stems arise from 8'; chandler shape; poor vigor; little live foliage.
27	Olive	15	No	3	Low	Multiple stems arise from 4'; base and trunk engulfed in euphorbia; full crown; some decay; twig dieback.
28	Blue atlas cedar	13	No	2	Low	Multiple stems arise from 12'; chandler shape; poor vigor; little live foliage.
29	Nichol's willowleafed peppermint	15	No	2	Low	Codominant trunks arise from 12'; one sided south; thin crown; 8' trunk wound.
30	Nichol's willowleafed peppermint	13	No	3	Moderate	Multiple branches arise from 14'; thin round crown.
31	Nichol's willowleafed peppermint	15	No	3	Moderate	Multiple branches arise from 14'; thin round crown; upright form and structure.
32	Olive	8	No	3	Moderate	Single upright trunk; base and trunk engulfed in euphorbia; full crown; some decay.
33	Olive	7	No	3	Moderate	Single upright trunk; base and trunk engulfed in euphorbia; full crown; some decay; leaning north.

Tree Assessment

Pinole Square
Pinole, CA
September 26, 2017

Tree No.	Species	Trunk Diameter (in.)	Protected Tree	Condition 1=poor 5=excellent	Suitability for Preservation	Comments
34	Nichol's willowleafed peppermint	29	Yes	3	Low	Multiple branches arise from 14'; thin round crown; history of branch failure; sucker growth.
35	Nichol's willowleafed peppermint	25	Yes	3	Low	Multiple branches arise from 14'; thin round crown; history of branch failure; sucker growth; topped.
36	Nichol's willowleafed peppermint	20	Yes	3	Low	Wide attachment @ 10'; topped for utility line clearance; sucker growth; thin.
37	Nichol's willowleafed peppermint	28	Yes	3	Low	Multiple stems arise from 14'; topped for utility line clearance; sucker growth; thin round crown.
38	Nichol's willowleafed peppermint	26	Yes	3	Low	Multiple stems arise from 14'; topped for utility line clearance; sucker growth; thin round crown.
39	Nichol's willowleafed peppermint	16	No	3	Low	Multiple stems arise from 10'; topped for utility line clearance; sucker growth; thin round crown.
40	Nichol's willowleafed peppermint	16	No	3	Low	Multiple stems arise from 14'; topped for utility line clearance; sucker growth; thin round crown; narrow attachments.
41	Nichol's willowleafed peppermint	14	No	3	Low	Multiple stems arise from 10'; topped for utility line clearance; sucker growth; thin upright crown.
42	Monterey pine	21	Yes	3	Moderate	Upright form and structure; recovered topped central leader; twig and branch dieback.
43	Monterey pine	23	Yes	3	Moderate	Upright form and structure; recovered topped central leader; twig and branch dieback.

Tree No.	Species	Trunk Diameter (in.)	Protected Tree	Condition 1=poor 5=excellent	Suitability for Preservation	Comments
44	Monterey pine	25	Yes	4	Moderate	Off-site tagged on fence; overhangs by 22'; upright form and structure; full crown.
45	Monterey pine	25	Yes	4	Moderate	Off-site tagged on fence; overhangs by 28'; upright form and structure; full crown.
46	Monterey pine	25	Yes	3	Moderate	Off-site tagged on fence; overhangs by 12'; upright form and structure; thin crown; girdled at 15'.
47	Monterey pine	15,15	No	3	Moderate	Off-site tagged on fence; overhangs by 10'; codominant trunks; thin crown.
48	Monterey pine	21	Yes	4	Moderate	Off-site tagged on fence; overhangs by 14'; upright form and structure; full crown.
49	Monterey pine	21	Yes	3	Moderate	Off-site tagged on fence; overhangs by 14'; upright form and structure; thin; excess sap on trunk.
50	Monterey pine	24	Yes	4	Moderate	Off-site tagged on fence; overhangs by 8'; upright form and structure; full crown.
51	Blue gum	35	Yes	3	Low	Off-site tagged on fence; overhangs by 14'; topped at 14'; thick interior growth; twig and branch dieback.
52	Blue gum	25	Yes	3	Low	Off-site tagged on fence; overhangs by 14'; topped at 14'; thick interior growth; twig and branch dieback.
53	Blue gum	25	Yes	3	Low	Off-site tagged on fence; overhangs by 14'; topped at 14'; thick interior growth; twig and branch dieback.
54	Blue gum	25	Yes	3	Low	Off-site tagged on fence; overhangs by 14'; topped at 14'; thick interior growth; twig and branch dieback.
55	Blue gum	Multiple stems of under 10"	No	3	Low	Off-site tagged on fence; overhangs by 14'; topped at 14'; thick interior growth; twig and branch dieback.
56	Blue gum	40	Yes	3	Low	Off-site tagged on fence; overhangs by 14'; topped at 14'; thick interior growth; twig and branch dieback.
57	Blue gum	25	Yes	3	Low	Off-site tagged on fence; overhangs by 14'; topped at 14'; thick interior growth; twig and branch dieback.

Tree Assessment

Pinole Square
Pinole, CA
September 26, 2017

Tree No.	Species	Trunk Diameter (in.)	Protected Tree	Condition 1=poor 5=excellent	Suitability for Preservation	Comments
58	Blue gum	35	Yes	3	Low	Off-site tagged on fence; overhangs by 14'; topped at 14'; thick interior growth; twig and branch dieback.
59	Blue gum	25	Yes	3	Low	Off-site tagged on fence; overhangs by 14'; topped at 14'; thick interior growth; twig and branch dieback.
60	Blue gum	40	Yes	3	Low	Off-site tagged on fence; overhangs by 14'; topped at 14'; thick interior growth; twig and branch dieback.
61	Blue gum	40	Yes	3	Low	Off-site tagged on fence; overhangs by 14'; topped at 14'; thick interior growth; twig and branch dieback.
62	Italian cypress	6	No	3	Moderate	Typical form and structure; one sided north away from structure.
63	Italian cypress	10	No	3	Moderate	Typical form and structure; one sided north away from structure.
64	Coast live oak	10	Yes	5	High	Off-site tagged on fence; overhangs by 2'; trunks divide into 3 trunks @ 6'.
65	Monterey pine	25	Yes	3	Moderate	Off-site tagged on fence; overhangs by 12'; upright form and structure; thin crown.
66	Monterey pine	34	Yes	3	Moderate	Off-site; overhangs by 12'; codominant trunks arise from 5'; full crown.
67	Monterey pine	31	Yes	3	Moderate	Off-site; overhangs by 5'; upright form and structure; thin crown.
68	Monterey pine	22	Yes	3	Moderate	Off-site; overhangs by 5'; upright form and structure; thin crown.
69	Monterey pine	22	Yes	3	Moderate	Off-site; overhangs by 5'; upright form and structure; thin crown.
70	Monterey pine	31	Yes	3	Moderate	Off-site; overhangs by 5'; upright form and structure; thin crown.

APPENDIX C

GEOTECHNICAL INVESTIGATION

CORNERSTONE
EARTH GROUP

TYPE OF SERVICES	Design-Level Geotechnical Investigation
PROJECT NAME	Pinole Square Shopping Center
LOCATION	1421 Tara Hills Drive Pinole, California
CLIENT	Hillsboro Properties, Inc.
PROJECT NUMBER	856-1-6
DATE	October 31,2019

CORNERSTONE
EARTH GROUP

Type of Services	**Design-Level Geotechnical Investigation**
Project Name	**Pinole Square Shopping Center**
Location	**1421 Tara Hills Drive** **Pinole, California**
Client	**Hillsboro Properties, Inc.**
Client Address	**1300 South El Camino Real, Suite 525** **San Mateo, CA**
Project Number	**856-1-6**
Date	**October 31, 2019**

REGISTERED PROFESSIONAL ENGINEER
JOHN R. DYE
No. GE2582
EXPIRES 12/31/20
GEOTECHNICAL
STATE OF CALIFORNIA

Prepared by **John R. Dye, P.E., G.E.**
Principal Engineer
Geotechnical Project Manager

Scott E. Fitinghoff, P.E., G.E.
Senior Principal Engineer
Quality Assurance Reviewer

CORNERSTONE
EARTH GROUP

TABLE OF CONTENTS

CORNERSTONE
EARTH GROUP

Type of Services	**Design-Level Geotechnical Investigation**
Project Name	**Pinole Square Shopping Center**
Location	**1421 Tara Hills Drive Pinole, California**

SECTION 1: INTRODUCTION

This geotechnical report was prepared for the sole use of Hillsboro Properties, Inc. for the Pinole Square Shopping Center in Pinole, California. The location of the site is shown on the Vicinity Map, Figure 1. For our use, we were provided with the following documents:

- A set of plans titled “Pinole Square, DR-17-23, CUP 17-12-CUP 17-18 & VAR 17-1, 1200-1577 Tara Hills Drive, Pinole, CA” prepared by Lowney Architecture, dated August 30, 2019.

- A set of preliminary grading and utility civil plans title “Pinole Square, 1200-1577 Tara Hills Drive, Pinole, CA, Sheets C3.1, C3.2, C4.1, C4.2” prepared by AMS Associates, Inc. dated August 28, 2019.

1.1 PROJECT DESCRIPTION

The project site is located at the southwest corner of the intersection of Tara Hills Drive and Appian Way in Pinole, California. The site is currently occupied by an existing shopping center (Appian 80) consisting of multiple one-story commercial/retail buildings, appurtenant asphalt parking, and landscaping areas. Redevelopment will consist of new commercial, retail, and restaurant buildings with footprints ranging from 4,159 to 55,746 sq. ft to be built in three phases. A new fuel station, canopy, kiosk and underground fuel tanks are proposed in the northern section of site. We expect the commercial, retail, and restaurant buildings to be of wood, concrete, or masonry construction with concrete slab-on-grade floors.

Structural loads are not yet finalized for the proposed structures; however, structural loads are expected to be typical of similar type structures. Preliminary grading plans indicate cuts and fills on the order of 1 to 3 feet would be required for the minor shops and pads. The new major grocery and shops building will require fills ranging from approximately 1 to 6 feet. Minor cuts and fills of approximately 1 foot or less are planned for the parking lot areas.

1.2 SCOPE OF SERVICES

Our scope of services was presented in our proposal dated March 29, 2019 and consisted of field and laboratory programs to evaluate physical and engineering properties of the subsurface soils, engineering analysis to prepare recommendations for site work and grading, building foundations, flatwork, and pavements, and preparation of this report. Brief descriptions of our exploration and laboratory programs are presented below.

1.3 EXPLORATION PROGRAM

Field exploration consisted of 11 borings drilled on October 8 and 9, 2019, with truck-mounted, hollow-stem auger drilling equipment. The borings were drilled to depths ranging from approximately 15 to 40 feet. The borings were backfilled with cement grout in accordance with local requirements; exploration permits were obtained as required by local jurisdictions.

The approximate locations of our exploratory borings are shown on the Site Plan, Figure 2. Details regarding our field program are included in Appendix A.

1.4 LABORATORY TESTING PROGRAM

In addition to visual classification of samples, the laboratory program focused on obtaining data for foundation design and seismic ground deformation estimates. Testing included moisture contents, dry densities, washed sieve analyses, Plasticity Index tests, and triaxial compression tests. Details regarding our laboratory program are included in Appendix B.

1.5 CORROSION EVALUATION

Four samples from our borings from depths from 1 to 5 feet were tested for saturated resistivity, pH, and soluble sulfates and chlorides. JDH Corrosion Consultants prepared a brief corrosion evaluation based on the laboratory data, which is attached to this report in Appendix C. In general, the on-site soils can be characterized as potentially corrosive to buried metal, and non-corrosive to buried concrete.

1.6 ENVIRONMENTAL SERVICES

Cornerstone Earth Group also provided environmental services for this project, including Phase 1 and 2 site assessments; environmental findings and conclusions are provided under separate covers. Exploration logs from our prior environmental studies are presented in Appendix D.

SECTION 2: REGIONAL SETTING

2.1 REGIONAL SEISMICITY

The San Francisco Bay area region is one of the most seismically active areas in the Country. While seismologists cannot predict earthquake events, the U.S. Geological Survey's Working Group on California Earthquake Probabilities 2015 revises earlier estimates from their 2008

(2008, UCERF2) publication. Compared to the previous assessment issued in 2008, the estimated rate of earthquakes around magnitude 6.7 (the size of the destructive 1994 Northridge earthquake) has gone down by about 30 percent. The expected frequency of such events statewide has dropped from an average of one per 4.8 years to about one per 6.3 years. However, in the new study, the estimate for the likelihood that California will experience a magnitude 8 or larger earthquake in the next 30 years has increased from about 4.7 percent for UCERF2 to about 7.0 percent for UCERF3.

UCERF3 estimates that each region of California will experience a magnitude 6.7 or larger earthquake in the next 30 years. Additionally, there is a 63 percent chance of at least one magnitude 6.7 or greater earthquake occurring in the Bay Area region between 2007 and 2036.

The faults considered capable of generating significant earthquakes are generally associated with the well-defined areas of crustal movement, which trend northwesterly. The table below presents the State-considered active faults within 25 kilometers of the site.

Table 1: Approximate Fault Distances

Fault Name	Distance	
	(miles)	(kilometers)
Hayward (Total Length)	2.6	4.2
Rogers Creek	6.7	10.8
West Napa	12.0	19.3
Concord-Green Valley	12.1	19.5

A regional fault map is presented as Figure 3, illustrating the relative distances of the site to significant fault zones.

SECTION 3: SITE CONDITIONS

3.1 SITE BACKGROUND

Based on our review of the information described in our Phase 1 Environmental Assessment report, prior environmental consultant's reports and available historic topographic and aerial photographs, the general site vicinity appears to have historically consisted mainly of vacant/undeveloped land with little agricultural activities. The site and vicinity appeared as gently sloping hillsides covered by grasses and localized drainages that likely conveyed surface water to one of several seasonal creeks that flowed north to San Francisco Bay. By 1958, Interstate 80 and the Appian Way interchanges were constructed. Fill was placed at the site during the highway construction. By 1968, much of the site vicinity had been developed with mostly residential properties and few commercial properties, mainly located near Appian Way. The existing commercial development appears to have been graded and constructed by the early 1960s. With the exception of a few newer commercial building additions, the site appears to have remained relatively unchanged since the 1990s.

A former Chevron gas station was originally located at the northwest corner of the site. The tanks and associated piping, waste oil and hydraulic lifts were reportedly removed from the site in 1997. Excavations during removal reportedly extended to depths ranging from about 7 to 14 feet below original site grades. Documentation or records of the excavation backfill were not available. The approximate locations of the former tank and piping excavations are shown on the Site Plan, Figure 2.

A car care center with fueling canopy, most recently referred to as the Rent-a-Rack filling station, was constructed near the southwest corner of the site in the early 1970s. The service station reportedly had two 10,000-gallon, one 1,000-gallon and one 500-gallon tanks removed in 1986. In 1987, the UST pits were reportedly re-excavated to a depth of approximately 26 feet to remove potentially impacted soils. Documentation or records of the excavation backfill were not available. The approximate location of the former tank excavation is also shown on the Site Plan, Figure 2.

3.2 SURFACE DESCRIPTION

The approximately 11.9-acre site is currently occupied by an existing retail shopping center referred to as Appian 80. The site is bounded by Tara Hills Drive to the north, Interstate 80 and associated undeveloped Caltrans right-of-way to the south, commercial properties and Appian Way to the east and existing residential development to the west. The site is occupied by one large commercial building at the south end of the site (existing Safeway and former drug store) and five smaller retail buildings along the west end of the site. The remainder of the site, with the exception of the former Chevron gas station, is covered with asphalt concrete paved surface parking and minor landscaping medians.

Based on available topographic plans, site grades generally range from approximately Elevation 195 to 200 feet along the eastern edge of the site to approximately Elevation 182 to 185 feet along the western edge of the site. A man-made fill slope borders the west and south edges of the site, which were constructed at an inclination of approximately 2:1 (horizontal:vertical). The west slope, which occurs just west of the property line on adjacent residential parcels, ranges from roughly 10 to 40 feet high. The south-facing fill slope adjacent to the Caltrans right-of-way ranges from about 40 feet high at the southwest corner to less than 5 feet high behind the southeast corner of the existing Safeway store. The slope transitions to a cut slope ranging up to 30 feet high along the east edge of the site. The approximate locations of the cut and fill slopes are depicted on the Site Plan, Figure 2.

Surface pavements generally consisted of 2 to 6 inches of asphalt concrete over 0 to 8 inches of granular base. Based on visual observations, the existing pavements are in fair to poor condition with localized significant cracking.

3.3 SUBSURFACE CONDITIONS

Below the surface pavements, our explorations generally encountered undocumented (man-made) fill that was primarily placed during original site development in the 1950s and 1960s.

Historic aerial photographs indicate most of the fill was likely derived from cuts made for the construction of Interstate 80 that was imported to the site and possibly from cuts at the east end of the site. The thickness of the original fill generally ranges from less than a few feet along the east edge of the site up to 32 feet thick at the southern edge of the site at Boring EB-10. The approximate thickness of the original fill is presented on Figure 2 at each boring location.

Recent localized undocumented fills are also present at the former gas stations (Chevron and Rent-a-Rack locations), as shown on Figure 2. These fills reportedly range up to 26 feet deep at the Rent-a-Rack site, where USTs and impacted soils were removed and replaced (Fugro 2013), to roughly 7 to 14 feet thick at the former Chevron site (Touchstone Developments 1997). Compaction records for these original and more recent fills were not available; therefore, these fills are considered undocumented.

The original fills primarily consist of alternating layers of stiff to very stiff lean and fat clays with varying percentages of sand and gravel, interbedded with occasional layers of medium dense to very dense clayey sand. The borings drilled for this investigation did not encountered recent fills in the former UST backfill areas; however, based on our review of prior borings drilled in 2013, the Rent-a-Rack UST fill consisted primarily of clay with varying percentages of sand and gravel. The stiffness or density of the Rent-a-Rack UST fill was not reported due to the direct-push method of drilling used (Fugro 2013).

The original and recent fills are underlain by a 2- to 5-foot thick layer of native residual soil consisting of very stiff fat clay. This residual soil layer is underlain by highly weathered, friable, weak bedrock regionally mapped as Tertiary-aged, interbedded sandstone, siltstone and conglomerate (Tcgl, Graymer 1994). Our borings primarily encountered interbedded sandstone, siltstone and some claystone. Conglomerate was not encountered in our borings. A more detailed description of the subsurface conditions is presented on the boring logs in Appendix A.

3.3.1 Plasticity/Expansion Potential

We performed three Plasticity Index (PI) tests on representative samples. Test results were used to evaluate expansion potential of surficial soils. The results of the surficial PI tests indicated PIs ranging from 20 to 36, indicating moderate to high expansion potential to wetting and drying cycles.

3.3.2 In-Situ Moisture Contents

Laboratory testing indicated that the in-situ moisture contents within the upper 15 feet range from 5 to 30 percent over the estimated laboratory optimum moisture.

3.4 GROUNDWATER

Groundwater was not encountered in any of our recent borings during drilling; however, the borings were not left open and were immediately backfilled when the boring was completed. As predominantly clay fill and bedrock were encountered, the borings were not likely left open long enough for water to seep into the boreholes.

We reviewed available groundwater data presented in prior environmental reports, including our recent soil and groundwater quality investigations (July 2019), and prior studies by West Environmental 2016 and Fugro 2013. Groundwater was encountered in Cornerstone environmental borings GW-3 and GW-4 in July 2019 at depths of approximately 15 and 20 feet, respectively, corresponding to Elevation 177 to 182 feet.

Monitoring wells installed in 2015 by West Environmental at the northeast corner of the site indicated groundwater levels ranging from approximately 5 to 17 feet deep, corresponding to Elevation 180 to 195 feet between April 2015 and November 2016. The location of these wells is shown on Figure 2.

Borings B-1, B-3 and B-4 drilled by Fugro in 2013 near the former Rent-a-Rack USTs encountered groundwater at depths of approximately 30 to 42 feet, corresponding to approximately Elevation 148 to 160 feet.

Fluctuations in ground water levels occur due to many factors including seasonal fluctuation, underground drainage patterns, regional fluctuations, and other factors.

SECTION 4: GEOLOGIC HAZARDS

4.1 FAULT RUPTURE

As discussed above several significant faults are located within 25 kilometers of the site. The site is not located within a State-designated Alquist-Priolo Earthquake Fault Zone. As shown in Figure 3, no known surface expression of fault traces is thought to cross the site; therefore, fault rupture hazard is not a significant geologic hazard at the site.

4.2 ESTIMATED GROUND SHAKING

Moderate to severe (design-level) earthquakes can cause strong ground shaking, which is the case for most sites within the Bay Area. A peak ground acceleration (PGA) was estimated for analysis using a value equal to F_{PGA} x PGA, as allowed in the 2016 edition of the California Building Code. For our analysis we used a PGA of 0.76g.

4.3 LIQUEFACTION POTENTIAL

The site is not currently mapped by the State of California, but is within a zone mapped as having a low liquefaction potential by the Association of Bay Area Governments (ABAG, 2006) However, we screened the site for liquefaction during our site exploration by retrieving samples from the site, performing visual classification on sampled materials, and performing various tests to further classify the soil properties.

During strong seismic shaking, cyclically induced stresses can cause increased pore pressures within the soil matrix that can result in liquefaction triggering, soil softening due to shear stress loss, potentially significant ground deformation due to settlement within sandy liquefiable layers as pore pressures dissipate, and/or flow failures in sloping ground or where open faces are present (lateral spreading) (NCEER 1998). Limited field and laboratory data is available regarding ground deformation due to settlement; however, in clean sand layers settlement on the order of 2 to 4 percent of the liquefied layer thickness can occur. Soils most susceptible to liquefaction are loose, non-cohesive soils that are saturated and are bedded with poor drainage, such as sand and silt layers bedded with a cohesive cap.

As discussed in the “Subsurface” section above, we primarily encountered stiff cohesive and dense granular soils underlain by bedrock. In addition, the design ground water level is anticipated to be below any granular soils. Based on the above, our screening of the site for liquefaction indicates a low potential for liquefaction.

4.4 LATERAL SPREADING

Lateral spreading is horizontal/lateral ground movement of relatively flat-lying soil deposits towards a free face such as an excavation, channel, or open body of water; typically, lateral spreading is associated with liquefaction of one or more subsurface layers near the bottom of the exposed slope. As failure tends to propagate as block failures, it is difficult to analyze and estimate where the first tension crack will form.

The potential for liquefaction is considered low; therefore, in our opinion, the potential for lateral spreading to affect the site is low.

4.5 SEISMIC SETTLEMENT/UNSATURATED SAND SHAKING

Loose unsaturated sandy soils can settle during strong seismic shaking. As the soils encountered at the site were predominantly stiff to very stiff clays and medium dense to dense sands, in our opinion, the potential for significant differential seismic settlement affecting the proposed improvements is low. The exception is at former underground storage tank (UST) locations. As previously discussed, prior USTs associated with former gas stations have been removed and backfilled. The fill is considered undocumented and may be susceptible to densification following strong ground shaking in the region. Undocumented fills will need to be removed and replaced with compacted fill. Once completed, the potential for seismic settlement should be adequately mitigated. Further discussion is presented in the “Conclusions” section of this report.

4.6 TSUNAMI/SEICHE

The terms tsunami or seiche are described as ocean waves or similar waves usually created by undersea fault movement or by a coastal or submerged landslide. Tsunamis may be generated at great distance from shore (far field events) or nearby (near field events). Waves are formed, as the displaced water moves to regain equilibrium, and radiates across the open water, similar to ripples from a rock being thrown into a pond. When the waveform reaches the coastline, it quickly raises the water level, with water velocities as high as 15 to 20 knots. The water mass, as well as vessels, vehicles, or other objects in its path create tremendous forces as they impact coastal structures.

Tsunamis have affected the coastline along the Pacific Northwest during historic times. The Fort Point tide gauge in San Francisco recorded approximately 21 tsunamis between 1854 and 1964. The 1964 Alaska earthquake generated a recorded wave height of 7.4 feet and drowned eleven people in Crescent City, California. For the case of a far-field event, the Bay area would have hours of warning; for a near field event, there may be only a few minutes of warning, if any.

A tsunami or seiche originating in the Pacific Ocean would lose much of its energy passing through San Francisco Bay. Based on the study of tsunami inundation potential for the San Francisco Bay Area (Ritter and Dupre, 1972), areas most likely to be inundated are marshlands, tidal flats, and former bay margin lands that are now artificially filled, but are still at or below sea level, and are generally within 1½ miles of the shoreline. The site is approximately 1 mile inland from the San Francisco Bay shoreline and is approximately 185 to 200 feet above mean sea level. Therefore, the potential for inundation due to tsunami or seiche is considered low.

4.7 FLOODING

Based on our internet search of the Federal Emergency Management Agency (FEMA) flood map public database, the site is located within Zone X, described as "Area of minimal flood hazard. We recommend the project civil engineer be retained to confirm this information and verify the base flood elevation, if appropriate.

SECTION 5: CONCLUSIONS

5.1 SUMMARY

From a geotechnical viewpoint, the project is feasible provided the concerns listed below are addressed in the project design. Descriptions of each concern with brief outlines of our recommendations follow the listed concerns.

- Presence of undocumented fill
- Presence of moderately to highly expansive soils
- Presences of localized shallow bedrock
- Potential high moisture content of shallow clay fills
- Soil corrosion potential

5.1.1 Undocumented Fill

As discussed in Section 3, our explorations generally encountered undocumented (man-made) fill blanketing most of the site that was primarily placed during original site development in the 1950s and 1960s. Historic aerial photographs indicate most of the fill was likely derived from cuts made for the construction of Interstate 80 that was imported to the site and from cuts at the east end of the site. The thickness of the original fill generally ranges from less than 5 feet along the east edge of the site up to 32 feet thick at the southern edge of the site at Boring

EB-10. The approximate thickness of the original fill is presented on Figure 2 at each boring location.

The original site fill appears relatively firm and consistent where encountered, therefore, most of the fill can remain in place. However, due to the variability of the shallow fills and likely disturbance during site demolition, we recommend that approximately 12 to 18 inches of fill be over-excavated and re-compacted within future building pad areas.

Recent localized fills associated with former Rent-a-Rack fuel UST backfill should be over-excavated and re-compacted to reduce the potential for localized differential settlement within future foundation and slab areas. The approximate location of the former Rent-a-Rack UST backfill is shown on Figure 2. In the former Chevron UST backfill areas, a new parking lot is planned. Therefore, over-excavation and re-compaction can be limited to the shallow portion of the fill. If desired, additional geotechnical exploration, potholing and/or in-situ density testing can be performed prior to or during site demolition to evaluate the density of the prior UST backfill. Recommendations addressing this concern are presented in the “Earthwork” section.

5.1.2 Expansive Soils

Moderately to high expansive surficial soils were encountered in our explorations are varying depths across the site. Expansive soils can undergo significant volume change with changes in moisture content. They shrink and harden when dried and expand and soften when wetted. To reduce the potential for damage to the planned structures, slabs-on-grade should have sufficient reinforcement and be supported on a layer of non-expansive fill; footings should extend below the zone of seasonal moisture fluctuation. In addition, it is important to limit moisture changes in the surficial soils by using positive drainage away from buildings as well as limiting landscaping watering. Grading and foundation recommendations addressing this concern are presented in the following sections.

5.1.3 Shallow Bedrock

Bedrock was encountered as shallow as 5 feet below current site grades in Boring EB-1. Bedrock was encountered below a depth of 10 feet in the remainder of our borings. The bedrock consists of interbedded sandstone, siltstone and claystone that is generally highly weathered, friable and with relatively low hardness. The bedrock can likely be excavated with conventional earthwork equipment; however, it is possible that localized harder bedrock could be encountered for deep utility or manhole excavations that encounter sandstone. Bedrock in the future underground fuel tank area was encountered at a depth of approximately 14 feet (Boring EB-11). Contractors performing deep excavations should be made aware of the variable soil and bedrock conditions.

5.1.4 High Moisture Content of Shallow Soils

As discuss above, clayey fills generally blanket the site and the moisture content of those clay soils was higher than anticipated. The moisture content of these soils ranged about 25 to 46 percent (average of about 30 percent), which is roughly 7 to 30 percent above the assumed laboratory optimum moisture content. Although shallow groundwater was not encountered in our recent borings, it is possible the clays remain seasonally moist due to capillary rise and surface water infiltration through existing pavements. Because the site is covered with pavement and building slabs, the soil likely does not dry out seasonally. Therefore, soil excavated during grading and underground utility installation may need to moisture conditioned to roughly 15 to 20 percent moisture prior to re-using the soil as fill material.

5.1.5 Soil Corrosion Potential

A preliminary soil corrosion screening was performed by JDH Corrosion Consultants based on the results of analytical tests on samples of the near-surface soil. In general, the JDH report concludes that the corrosion potential for buried concrete does not warrant the use of sulfate resistant concrete. However, the corrosion potential for buried metallic improvements, such as metal pipes, is considered corrosive. JDH recommends that special requirements for corrosion control be made to protect metal pipes. A more detailed discussion of the site corrosion evaluation is presented in Appendix C.

5.2 PLANS AND SPECIFICATIONS REVIEW

We recommend that we be retained to review the geotechnical aspects of the project structural, civil, and landscape plans and specifications, allowing sufficient time to provide the design team with any comments prior to issuing the plans for construction.

5.3 CONSTRUCTION OBSERVATION AND TESTING

As site conditions may vary significantly between the small-diameter borings performed during this investigation, we also recommend that a Cornerstone representative be present to provide geotechnical observation and testing during earthwork and foundation construction. This will allow us to form an opinion and prepare a letter at the end of construction regarding contractor compliance with project plans and specifications, and with the recommendations in our report. We will also be allowed to evaluate any conditions differing from those encountered during our investigation and provide supplemental recommendations as necessary. For these reasons, the recommendations in this report are contingent of Cornerstone providing observation and testing during construction. Contractors should provide at least a 48-hour notice when scheduling our field personnel.

SECTION 6: EARTHWORK

6.1 SITE DEMOLITION

All existing improvements not to be reused for the current development, including all foundations, flatwork, pavements, utilities, and other improvements should be demolished and removed from the site. Recommendations in this section apply to the removal of these improvements, which are currently present on the site, prior to the start of mass grading or the construction of new improvements for the project.

Cornerstone should be notified prior to the start of demolition and should be present on at least a part-time basis during all backfill and mass grading as a result of demolition. Occasionally, other types of buried structures (wells, cisterns, debris pits, etc.) can be found on sites with prior development. If encountered, Cornerstone should be contacted to address these types of structures on a case-by-case basis.

6.1.1 Demolition of Existing Slabs, Foundations and Pavements

All slabs, foundations, and pavements should be completely removed from within planned building areas.

As an owner value-engineered option, existing slabs, foundations, and pavements that extend into planned flatwork, pavement, or landscape areas may be left in place provided there is at least 3 feet of engineered fill overlying the remaining materials, they are shown not to conflict with new utilities, and that asphalt and concrete more than 10 feet square is broken up to allow subsurface drainage. Future distress and/or higher maintenance may result from leaving these prior improvements in place. A discussion of recycling existing improvements is provided later in this report.

Special care should be taken during the demolition and removal of existing floor slabs, foundations, utilities and pavements to minimize disturbance of the subgrade. Excessive disturbance of the subgrade, which includes either native or previously placed engineered fill, resulting from demolition activities can have serious detrimental effects on planned foundation and paving elements.

Existing foundations are typically mat-slabs, shallow footings, or piers/piles. If slab or shallow footings are encountered, they should be completely removed. If drilled piers are encountered, they should be cut off at an elevation at least 60-inches below proposed footings or the final subgrade elevation, whichever is deeper. The remainder of the drilled pier could remain in place. Foundation elements to remain in place should be surveyed and superimposed on the proposed development plans to determine the potential for conflicts or detrimental impacts to the planned construction. Following review, additional mitigation or planned foundation elements may need to be modified.

6.1.2 Abandonment of Existing Utilities

All utilities should be completely removed from within planned building areas. For any utility line to be considered acceptable to remain within building areas, the utility line must be completely backfilled with grout or sand-cement slurry (sand slurry is not acceptable), the ends outside the building area capped with concrete, and the trench fills either removed and replaced as engineered fill with the trench side slopes flattened to at least 1:1, or the trench fills are determined not to be a risk to the structure. The assessment of the level of risk posed by the particular utility line will determine whether the utility may be abandoned in place or needs to be completely removed. The contractor should assume that all utilities will be removed from within building areas unless provided written confirmation from both the owner and the geotechnical engineer.

Utilities extending beyond the building area may be abandoned in place provided the ends are plugged with concrete, they do not conflict with planned improvements, and that the trench fills do not pose significant risk to the planned surface improvements.

The risk for owners associated with abandoning utilities in place include the potential for future differential settlement of existing trench fills, and/or partial collapse and potential ground loss into utility lines that are not completely filled with grout.

6.2 SITE CLEARING AND PREPARATION

6.2.1 Site Stripping

The site should be stripped of all surface vegetation, and surface and subsurface improvements to be removed within the proposed development area. Demolition of existing improvements is discussed in the prior paragraphs. A detailed discussion of re-compaction of existing fills is provided later in this report. Surface vegetation and topsoil, where present in existing landscaping areas, should be stripped to a sufficient depth to remove all material greater than 3 percent organic content by weight. Based on our site observations, surficial stripping should extend about 3 to 6 inches below existing grade in vegetated areas.

6.2.2 Tree and Shrub Removal

Trees and shrubs designated for removal should have the root balls and any roots greater than ½-inch diameter removed completely. Mature trees are estimated to have root balls extending to depths of 2 to 4 feet, depending on the tree size. Significant root zones are anticipated to extend to the diameter of the tree canopy. Grade depressions resulting from root ball removal should be cleaned of loose material and backfilled in accordance with the recommendations in the “Compaction” section of this report.

6.3 EXISTING FILL OVER-EXCAVATION

As discussed, our explorations encountered existing undocumented fills that were reportedly placed during original site construction or during subsequent underground storage tank (UST) removals. The original site fills appear to be relatively firm and do not warrant significant re-compaction. However, we recommend that the upper portion of these original fills be recompacted prior to placement of new fills or foundation construction, as summarized in the following table.

Table 2. Summary of Original Fill Over-Excavation Depths

Building Location	Recommended Over-Excavation Depth[1] (feet)
Safeway/Major Shops	24
Shops 1	18
Fueling Station Kiosk	12
Fueling Station	12
Pad 1	12

[1] Depth below current site grades in unimproved areas or bottom of existing pavement section or slab-on-grade.

For the former Rent-a-Rack UST backfill area, the depth of the undocumented fill is reportedly up to 26 feet. The fill compaction was not documented and could potentially settle under the weight of future fill and foundation loads. Therefore, on a preliminary basis, we recommend that all former Rent-a-Rack UST backfill be re-excavated and replaced with compacted fill.

For the former Chevron UST backfill area, the depth of the fill reportedly ranges from 5 to 14 feet. The fill compaction was also not documented and could potentially settle under the weight of future fill and parking lot loads. Therefore, on a preliminary basis, we recommend that the former Chevron UST backfill be over-excavated to a depth of 3 feet and replaced with compacted fill.

Re-use of the former UST backfill will need to be further evaluated in accordance with the Site Management Plan prepared by Cornerstone Earth Group dated September 20, 2019. For budgeting purposes, we recommend the above over-excavation depths be used. It may be possible to reduce the depth of UST fill over-excavation if additional subsurface exploration and/or in-situ density testing is performed within the fill. Additional subsurface exploration in the former UST areas could consist of supplemental borings, potholes and/or in-situ density field density testing.

In general, over-excavation should be performed to a lateral distance of at least 5 feet beyond the building footprint or to a lateral distance equal to fill depth below the perimeter footing, whichever is greater. Provided the fills meet the “Material for Fill” requirements below, the fills may be reused when backfilling the excavations. Based on review of the samples collected from our borings, it appears that the fill may be reused. If materials are encountered that do not meet the requirements, such as debris, wood, trash, those materials should be screened out of the remaining material and be removed from the site. Backfill of excavations should be placed in lifts and compacted in accordance with the “Compaction” section below.

6.4 TEMPORARY CUT AND FILL SLOPES

The contractor is responsible for maintaining all temporary slopes and providing temporary shoring where required. Temporary shoring, bracing, and cuts/fills should be performed in accordance with the strictest government safety standards. On a preliminary basis, the upper 15 feet at the site may be classified as OSHA Site C materials. A Cornerstone representative should be retained to confirm the preliminary site classification.

Excavations performed during site demolition and fill removal should be sloped at 2:1 (horizontal:vertical) within the upper 5 feet below building subgrade. Excavations extending more than 5 feet below building subgrade and excavations in pavement and flatwork areas should be slope at a 1:1 inclination unless the OSHA soil classification indicates that slope should not exceed 1.5:1.

6.5 SUBGRADE PREPARATION

After site clearing and demolition is complete, and prior to backfilling any excavations resulting from fill over-excavation or demolition, the excavation subgrade and subgrade within areas to receive additional site fills, slabs-on-grade and/or pavements should be scarified to a depth of 12 inches, moisture conditioned, and compacted in accordance with the “Compaction” section below.

6.6 SUBGRADE STABILIZATION MEASURES

Soil subgrade and fill materials, especially soils with high fines contents such as clays and silty soils, can become unstable due to high moisture content, whether from high in-situ moisture contents or from winter rains. As the moisture content increases over the laboratory optimum, it becomes more likely the materials will be subject to softening and yielding (pumping) from construction loading or become unworkable during placement and compaction.

There are several methods to address potential unstable soil conditions and facilitate fill placement and trench backfill. Some of the methods are briefly discussed below. Implementation of the appropriate stabilization measures should be evaluated on a case-by-case basis according to the project construction goals and the particular site conditions.

6.6.1 Scarification and Drying

The subgrade may be scarified to a depth of 6 to 12 inches and allowed to dry to near optimum conditions, if sufficient dry weather is anticipated to allow sufficient drying. More than one round of scarification may be needed to break up the soil clods.

6.6.2 Removal and Replacement

As an alternative to scarification, the contractor may choose to over-excavate the unstable soils and replace them with dry on-site or import materials. A Cornerstone representative should be present to provide recommendations regarding the appropriate depth of over-excavation, whether a geosynthethic (stabilization fabric or geogrid) is recommended, and what materials are recommended for backfill.

6.6.3 Chemical Treatment

Where the unstable area exceeds about 5,000 to 10,000 square feet and/or site winterization is desired, chemical treatment with quicklime (CaO), kiln-dust, or cement may be more cost-effective than removal and replacement. Recommended chemical treatment depths will typically range from 12 to 18 inches depending on the magnitude of the instability.

6.7 MATERIAL FOR FILL

6.7.1 Re-Use of On-site Soils

On-site soils with an organic content less than 3 percent by weight may be reused as general fill. General fill should not have lumps, clods or cobble pieces larger than 6 inches in diameter; 85 percent of the fill should be smaller than 2½ inches in diameter. Minor amounts of oversize material (smaller than 12 inches in diameter) may be allowed provided the oversized pieces are not allowed to nest together and the compaction method will allow for loosely placed lifts not exceeding 12 inches.

6.7.2 Re-Use of On-Site Site Improvements

We anticipate that significant quantities of asphalt concrete (AC) grindings and aggregate base (AB) will be generated during site demolition. If the AC grindings are mixed with the underlying AB to meet Class 2 AB specifications, they may be reused within the new pavement and flatwork structural sections. AC/AB grindings may not be reused within the retail building areas. Laboratory testing will be required to confirm the grindings meet project specifications.

If the site area allows for on-site pulverization of PCC and provided the PCC is pulverized to meet the "Material for Fill" requirements of this report, it may be used as select fill within the retail building areas, excluding the capillary break layer; as typically pulverized PCC comes close to or meets Class 2 AB specifications, the recycled PCC can likely be used within the pavement structural sections. PCC grindings also make good winter construction access roads, similar to a cement-treated base (CTB) section.

6.7.3 Potential Import Sources

Imported fill for use as general building pad fill should be inorganic and have a Plasticity Index of 20 or less; non-expansive material should have a Plasticity Index (PI) of 15 or less. Import fill should not contain recycled asphalt concrete where it will be used within the building areas. To prevent significant caving during trenching or foundation construction, imported material should have sufficient fines. Samples of potential import sources should be delivered to our office at least 10 days prior to the desired import start date. Information regarding the import source should be provided, such as any site geotechnical reports. If the material will be derived from an excavation rather than a stockpile, potholes will likely be required to collect samples from throughout the depth of the planned cut that will be imported. At a minimum, laboratory testing will include PI tests. Material data sheets for select fill materials (Class 2 aggregate base, ¾-inch crushed rock, quarry fines, etc.) listing current laboratory testing data (not older than 6 months from the import date) may be provided for our review without providing a sample. If current data is not available, specification testing will need to be completed prior to approval.

Environmental and soil corrosion characterization should also be considered by the project team prior to acceptance. Suitable environmental laboratory data to the planned import quantity should be provided to the project environmental consultant; additional laboratory testing may be required based on the project environmental consultant's review. The potential import source should also not be more corrosive than the on-site soils, based on pH, saturated resistivity, and soluble sulfate and chloride testing.

6.7.4 Non-Expansive Fill Using Lime Treatment

As discussed above, non-expansive fill should have a Plasticity Index (PI) of 15 or less. Due to the high clay content and PI of the on-site soil materials, it is not likely that sufficient quantities of non-expansive fill would be generated from cut materials. As an alternative to importing non-expansive fill, chemical treatment can be considered to create non-expansive fill. It has been our experience that high PI clayey soil will likely need to be mixed with at least 3 to 4 percent quicklime (CaO) or approved equivalent to adequately reduce the PI of the on-site soils to 15 or less. If this option is considered, additional laboratory tests should be performed during initial site grading to further evaluate the optimum percentage of quicklime required.

6.8 COMPACTION REQUIREMENTS

All fills, and subgrade areas where fill, slabs-on-grade, and pavements are planned, should be placed in loose lifts 8 inches thick or less and compacted in accordance with ASTM D1557 (latest version) requirements as shown in the table below. In general, clayey soils should be compacted with sheepsfoot equipment and sandy/gravelly soils with vibratory equipment; open-graded materials such as crushed rock should be placed in lifts no thicker than 18 inches consolidated in place with vibratory equipment. Each lift of fill and all subgrade should be firm and unyielding under construction equipment loading in addition to meeting the compaction requirements to be approved. The contractor (with input from a Cornerstone representative) should evaluate the in-situ moisture conditions, as the use of vibratory equipment on soils with high moistures can cause unstable conditions. General recommendations for soil stabilization are provided in the "Subgrade Stabilization Measures" section of this report. Where the soil's PI is 20 or greater, the expansive soil criteria should be used.

Table 3: Compaction Requirements

Description	Material Description	Minimum Relative[1] Compaction (percent)	Moisture[2] Content (percent)
General Fill (within upper 5 feet)	On-Site Expansive Soils	87 – 92	>3
	Low Expansion Soils	90	>1
Trench Backfill	On-Site Expansive Soils	87 – 92	>3
Trench Backfill	Low Expansion Soils	90	>1
Trench Backfill (upper 6 inches of subgrade)	On-Site Low Expansion Soils	95	>1
Crushed Rock Fill	¾-inch Clean Crushed Rock	Consolidate In-Place	NA
Non-Expansive Fill	Imported Non-Expansive Fill	90	Optimum
Flatwork Subgrade	On-Site Expansive Soils	87 - 92	>3
Flatwork Subgrade	Low Expansion Soils	90	>1
Flatwork Aggregate Base	Class 2 Aggregate Base[3]	90	Optimum
Pavement Subgrade	On-Site Expansive Soils	87 - 92	>3
Pavement Subgrade	Low Expansion Soils	95	>1
Pavement Aggregate Base	Class 2 Aggregate Base[3]	95	Optimum
Asphalt Concrete	Asphalt Concrete	95 (Marshall)	NA

1 – Relative compaction based on maximum density determined by ASTM D1557 (latest version)
2 – Moisture content based on optimum moisture content determined by ASTM D1557 (latest version)
3 – Class 2 aggregate base shall conform to Caltrans Standard Specifications, latest edition, except that the relative compaction should be determined by ASTM D1557 (latest version)
4 – Using light-weight compaction or walls should be braced

6.8.1 Construction Moisture Conditioning

Expansive soils can undergo significant volume change when dried then wetted. The contractor should keep all exposed expansive soil subgrade (and also trench excavation side walls) moist until protected by overlying improvements (or trenches are backfilled). If expansive soils are allowed to dry out significantly, re-moisture conditioning may require several days of re-wetting (flooding is not recommended), or deep scarification, moisture conditioning, and re-compaction.

6.9 TRENCH BACKFILL

Utility lines constructed within public right-of-way should be trenched, bedded and shaded, and backfilled in accordance with the local or governing jurisdictional requirements. Utility lines in private improvement areas should be constructed in accordance with the following requirements unless superseded by other governing requirements.

All utility lines should be bedded and shaded to at least 6 inches over the top of the lines with crushed rock (⅜-inch-diameter or greater) or well-graded sand and gravel materials conforming to the pipe manufacturer's requirements. Open-graded shading materials should be consolidated in place with vibratory equipment and well-graded materials should be compacted to at least 90 percent relative compaction with vibratory equipment prior to placing subsequent backfill materials.

General backfill over shading materials may consist of on-site native materials provided they meet the requirements in the "Material for Fill" section, and are moisture conditioned and compacted in accordance with the requirements in the "Compaction" section.

Where utility lines will cross perpendicular to strip footings, the footing should be deepened to encase the utility line, providing sleeves or flexible cushions to protect the pipes from anticipated foundation settlement, or the utility lines should be backfilled to the bottom of footing with sand-cement slurry or lean concrete. Where utility lines will parallel footings and will extend below the "foundation plane of influence," an imaginary 1:1 plane projected down from the bottom edge of the footing, either the footing will need to be deepened so that the pipe is above the foundation plane of influence or the utility trench will need to be backfilled with sand-cement slurry or lean concrete within the influence zone. Sand-cement slurry used within foundation influence zones should have a minimum compressive strength of 75 psi.

On expansive soils sites it is desirable to reduce the potential for water migration into building and pavement areas through the granular shading materials. We recommend that a plug of low-permeability clay soil, sand-cement slurry, or lean concrete be placed within trenches just outside where the trenches pass into building and pavement areas.

6.10 SITE DRAINAGE

Surface runoff should not be allowed to flow over the top of existing fill slopes along the southern edge of the site. Ponding should not be allowed adjacent to building foundations, slabs-on-grade, or pavements. Hardscape surfaces should slope at least 2 percent towards suitable discharge facilities; landscape areas should slope at least 3 percent towards suitable discharge facilities. Roof runoff should be directed away from building areas in closed conduits, to approved infiltration facilities, or on to hardscaped surfaces that drain to suitable facilities. Retention, detention or infiltration facilities should be spaced at least 10 feet from buildings, and preferably at least 5 feet from slabs-on-grade or pavements. However, if retention, detention or infiltration facilities are located within these zones, we recommend that these treatment facilities meet the requirements in the Storm Water Treatment Design Considerations section of this report.

6.11 LOW-IMPACT DEVELOPMENT (LID) IMPROVEMENTS

The Municipal Regional Permit (MRP) requires regulated projects to treat 100 percent of the amount of runoff identified in Provision C.3.d from a regulated project's drainage area with low impact development (LID) treatment measures onsite or at a joint stormwater treatment facility. LID treatment measures are defined as rainwater harvesting and use, infiltration, evapotranspiration, or biotreatment. A biotreatment system may only be used if it is infeasible to implement harvesting and use, infiltration, or evapotranspiration at a project site.

Technical infeasibility of infiltration may result from site conditions that restrict the operability of infiltration measures and devices. Various factors affecting the feasibility of infiltration treatment may create an environmental risk, structural stability risk, or physically restrict infiltration. The presence of any of these limiting factors may render infiltration technically infeasible for a proposed project. To aid in determining if infiltration may be feasible at the site, we provide the following site information regarding factors that may aid in determining the feasibility of infiltration facilities at the site.

- The near-surface soils at the site are primarily clayey and categorized as Hydrologic Soil Group D. These soils are expected to have infiltration rates of less than 0.2 inches per hour. In our opinion, these clayey soils will significantly limit the infiltration of stormwater.
- Locally, seasonal high ground water is mapped at a depth of about 10 feet or more, and therefore is expected to be at least 10 feet below the base of the infiltration measure.

6.11.1 Storm Water Treatment Design Considerations

If storm water treatment improvements, such as shallow bio-retention swales, basins or pervious pavements, are required as part of the site improvements to satisfy Storm Water Quality (C.3) requirements, we recommend the following items be considered for design and construction.

6.11.1.1 General Bioswale Design Guidelines

- If possible, avoid placing bioswales or basins within 10 feet of the building perimeter or within 5 feet of exterior flatwork or pavements. If bioswales must be constructed within these setbacks, the side(s) and bottom of the trench excavation should be lined with 10-mil visqueen to reduce water infiltration into the surrounding expansive clay.
- Bioswales constructed within 3 feet of proposed buildings may be within the foundation zone of influence for perimeter wall loads. Therefore, where bioswales will parallel foundations and will extend below the “foundation plane of influence,” an imaginary 1:1 plane projected down from the bottom edge of the foundation, the foundation will need to be deepened so that the bottom edge of the bioswale filter material is above the foundation plane of influence.
- The bottom of bioswale or detention areas should include a perforated drain placed at a low point, such as a shallow trench or sloped bottom, to reduce water infiltration into the surrounding soils near structural improvements, and to address the low infiltration capacity of the on-site clay soils.

6.11.1.2 Bioswale Infiltration Material

- Gradation specifications for bioswale filter material, if required, should be specified on the grading and improvement plans.
- Compaction requirements for bioswale filter material in non-landscaped areas or in pervious pavement areas, if any, should be indicated on the plans and specifications to satisfy the anticipated use of the infiltration area.
- If required, infiltration (percolation) testing should be performed on representative samples of potential bioswale materials prior to construction to check for general conformance with the specified infiltration rates.
- It should be noted that multiple laboratory tests may be required to evaluate the properties of the bioswale materials, including percolation, landscape suitability and possibly environmental analytical testing depending on the source of the material. We recommend that the landscape architect provide input on the required landscape suitability tests if bioswales are to be planted.
- If bioswales are to be vegetated, the landscape architect should select planting materials that do not reduce or inhibit the water infiltration rate, such as covering the bioswale with grass sod containing a clayey soil base.
- If required by governing agencies, field infiltration testing should be specified on the grading and improvement plans. The appropriate infiltration test method, duration and frequency of testing should be specified in accordance with local requirements.
- Due to the relatively loose consistency and/or high organic content of many bioswale filter materials, long-term settlement of the bioswale medium should be anticipated. To reduce initial volume loss, bioswale filter material should be wetted in 12-inch lifts during placement to pre-consolidate the material. Mechanical compaction should not be allowed, unless specified on the grading and improvement plans, since this could significantly decrease the infiltration rate of the bioswale materials.
- It should be noted that the volume of bioswale filter material may decrease over time depending on the organic content of the material. Additional filter material may need to be added to bioswales after the initial exposure to winter rains and periodically over the life of the bioswale areas, as needed.

6.11.1.3 Bioswale Construction Adjacent to Pavements

If bio-infiltration swales or basins are considered adjacent to proposed parking lots or exterior flatwork, we recommend that mitigative measures be considered in the design and construction of these facilities to reduce potential impacts to flatwork or pavements. Exterior flatwork, concrete curbs, and pavements located directly adjacent to bio-swales may be susceptible to settlement or lateral movement, depending on the configuration of the bioswale and the setback between the improvements and edge of the swale. To reduce the potential for distress to these improvements due to vertical or lateral movement, the following options should be considered by the project civil engineer:

- Improvements should be setback from the vertical edge of a bioswale such that there is at least 1 foot of horizontal distance between the edge of improvements and the top edge of the bioswale excavation for every 1 foot of vertical bioswale depth, or

- Concrete curbs for pavements, or lateral restraint for exterior flatwork, located directly adjacent to a vertical bioswale cut should be designed to resist lateral earth pressures in accordance with the recommendations in the "Retaining Walls" section of this report, or concrete curbs or edge restraint should be adequately keyed into the native soil or engineered to reduce the potential for rotation or lateral movement of the curbs.

6.12 LANDSCAPE CONSIDERATIONS

Since the near-surface soils are expansive, we recommend greatly reducing the amount of surface water infiltrating these soils near foundations and exterior slabs-on-grade. This can typically be achieved by:

- Using drip irrigation

- Avoiding open planting within 3 feet of the building perimeter or near the top of existing slopes

- Regulating the amount of water distributed to lawns or planter areas by using irrigation timers

- Selecting landscaping that requires little or no watering, especially near foundations.

We recommend that the landscape architect consider these items when developing landscaping plans.

SECTION 7: FOUNDATIONS

7.1 SUMMARY OF RECOMMENDATIONS

In our opinion, the proposed structures may be supported on shallow foundations provided the recommendations in the "Earthwork" section and the sections below are followed.

7.2 SEISMIC DESIGN CRITERIA

We understand that the project structural design will be based on the 2016 California Building Code (CBC), which provides criteria for the seismic design of buildings in Chapter 16. The "Seismic Coefficients" used to design buildings are established based on a series of tables and figures addressing different site factors, including the soil profile in the upper 100 feet below grade and mapped spectral acceleration parameters based on distance to the controlling seismic source/fault system. Based on our borings and review of local geology, the site is underlain by very stiff man-made clay fill and native alluvial soil underlain by Tertiary-aged bedrock consisting of interbedded sandstone and siltstone. The subsurface data indicates soil shear strengths of approximately 2,000 psf. Available published data by Wills & Silva (1998) indicates the shear wave velocity for this age bedrock ranges from about 400 to 450 m/s. SPT "N" values for the bedrock were generally greater than 50 blows per foot. Therefore, we have classified the site as Soil Classification C. The mapped spectral acceleration parameters S_S and S_1 were calculated using the ATC Location web-based program *ATC Hazard by Location*, located at https://hazards.atcouncil.org/, based on the site coordinates presented below and the site classification. The table below lists the various factors used to determine the seismic coefficients and other parameters.

Table 4: CBC Site Categorization and Site Coefficients

Classification/Coefficient	Design Value
Site Class	C
Site Latitude	37.994395°
Site Longitude	-122.304946°
0.2-second Period Mapped Spectral Acceleration[1], S_S	1.978g
1-second Period Mapped Spectral Acceleration[1], S_1	0.804g
Short-Period Site Coefficient – Fa	1.0
Long-Period Site Coefficient – Fv	1.3
0.2-second Period, Maximum Considered Earthquake Spectral Response Acceleration Adjusted for Site Effects - S_{MS}	1.978g
1-second Period, Maximum Considered Earthquake Spectral Response Acceleration Adjusted for Site Effects – S_{M1}	1.045g
0.2-second Period, Design Earthquake Spectral Response Acceleration – S_{DS}	1.319g
1-second Period, Design Earthquake Spectral Response Acceleration – S_{D1}	0.697g

[1]For Site Class B, 5 percent damped.

7.3 SHALLOW FOUNDATIONS

7.3.1 Spread Footings

The proposed retail buildings and fuel station canopy may be supported on conventional shallow footings that bear on engineered fill and have the minimum dimensions presented in the table below. Bottom of footing is based on lowest adjacent grade, defined as the deeper of the following: 1) bottom of the adjacent interior slab-on-grade, or 2) finished exterior grade, excluding landscaping topsoil.

Table 5: Minimum Footing Dimensions

Building Type	Minimum Footing Width (inches)	Minimum Depth to Bottom of Footing (inches)
Major Retail	18	18
Minor Shops/Pads	15	18
Fuel Canopy	24	24

The deeper footing embedment is due to the presence of expansive soils and is intended to embed the footing below the zone of significant seasonal moisture fluctuation, reducing the potential for differential movement.

Footings constructed to the above dimensions and in accordance with the "Earthwork" recommendations of this report are capable of supporting maximum allowable bearing pressures of 2,000 psf for dead loads, 3,000 psf for combined dead plus live loads, and 4,000 psf for all loads including wind and seismic. These pressures are based on factors of safety of 3.0, 2.0, and 1.5 applied to the ultimate bearing pressure for dead, dead plus live, and all loads, respectively. These pressures are net values; the weight of the footing may be neglected for the portion of the footing extending below grade (typically, the full footing depth). Top and bottom reinforcing steel should be included in continuous footings to help span irregularities and differential settlement.

7.3.2 Footing Settlement

Structural loads were not available at the time this report was prepared. For the Safeway and major shops buildings, we assumed that maximum interior column dead plus real live loads would be on the order of 150 kips and perimeter wall loads would be on the order of 6 to 8 kips per lineal foot. Based on the above loading and the allowable bearing pressures presented above, and assuming undocumented fills associated with the former UST backfill areas are mitigated in accordance with the recommendations presented in the "Earthwork" section, we estimate that the total static footing settlement will be on the order of ¾ to 1 inch, with about ½ to ¾ inch of post-construction differential settlement between adjacent foundation elements.

For the remaining retail structures (minor shops and pads), we assumed that maximum interior column dead plus real live loads would be on the order of 25 to 50 kips and perimeter wall loads would be on the order of 3 kips per lineal foot or less. We estimate that the total static footing settlement will be on the order of ½ to ¾ inch, with about ½ inch of post-construction differential settlement between adjacent foundation elements.

7.3.3 Lateral Loading

Lateral loads may be resisted by friction between the bottom of footing and the supporting subgrade, and also by passive pressures generated against footing sidewalls. An ultimate frictional resistance of 0.45 applied to the footing dead load, and an ultimate passive pressure based on an equivalent fluid pressure of 450 pcf may be used in design. The structural engineer should apply an appropriate factor of safety (such as 1.5) to the ultimate values above. Where footings are adjacent to landscape areas without hardscape, the upper 12 inches of soil should be neglected when determining passive pressure capacity.

7.3.4 Spread Footing Construction Considerations

Where utility lines will cross perpendicular to strip footings, the footing should be deepened to encase the utility line, providing sleeves or flexible cushions to protect the pipes from anticipated foundation settlement, or the utility lines should be backfilled to the bottom of footing with sand-cement slurry or lean concrete. Where utility lines will parallel footings and will extend below the "foundation plane of influence," an imaginary 1:1 plane projected down from the bottom edge of the footing, either the footing will need to be deepened so that the pipe is above the foundation plane of influence or the utility trench will need to be backfilled with sand-cement slurry or lean concrete within the influence zone. Sand-cement slurry used within foundation influence zones should have a minimum compressive strength of 75 psi.

Footing excavations should be filled as soon as possible or be kept moist until concrete placement by regular sprinkling to prevent desiccation. A Cornerstone representative should observe all footing excavations prior to placing reinforcing steel and concrete. If there is a significant schedule delay between our initial observation and concrete placement, we may need to re-observe the excavations.

7.4 DRILLED PIERS

As an alternative to shallow footings, the proposed structural loads for the fuel island canopy may be supported on drilled, cast-in-place, straight-shaft friction piers. The piers should have a minimum diameter of 24 inches and extend to a depth of at least 15 feet below existing grade or 2 feet into native bedrock, whichever is deeper. Adjacent piers centers should be spaced at least three diameters apart, otherwise, a reduction for group effects may be required.

7.4.1 Vertical Capacity and Estimated Settlement

The vertical capacity of the piers may be designed based on the allowable skin friction values presented below for combined dead plus live loads based on a factor of safety of 2.0; dead loads should not exceed two-thirds of the allowable capacities. The allowable skin friction may be increased by one-third for wind and seismic loads. Frictional resistance to uplift loads may be developed along the pier shafts based on the allowable frictional resistance value shown in the following table.

Table 6: Allowable Skin Friction

Depth Below Existing Grade (feet)	Allowable Skin Friction (psf)	Allowable Uplift Skin Friction (psf)
0 – 10	500	400
10 – 20	700	575

Total settlement of individual piers or pier groups of four or less should not exceed ¼ to ½ inch to mobilize static capacities and post-construction differential settlement between piers should not exceed ¼ inch due to static loads.

7.4.2 Lateral Capacity

Lateral loads exerted on drilled piers may be resisted by a passive resistance based on an ultimate equivalent fluid pressure of 500 pcf acting against twice the projected area of piers below the pier cap or grade beam within pier groups of two or more and over two pier diameters for single piers, up to a maximum uniform pressure of 3,000 psf at depth. The structural engineer should apply an appropriate factor of safety to the ultimate passive pressures.

7.4.3 Construction Considerations

The excavation of all drilled shafts should be observed by a Cornerstone representative to confirm the soil profile, verify that the piers extend the minimum depth into suitable materials and that the piers are constructed in accordance with our recommendations and project requirements. The drilled shafts should be straight, dry, and relatively free of loose material before reinforcing steel is installed and concrete is placed. If ground water is encountered and cannot be removed from the excavations prior to concrete placement, drilling slurry or casing may be required to stabilize the shaft and the concrete should be placed using a tremie pipe, keeping the tremie pipe below the surface of the concrete to avoid entrapment of water or drilling slurry in the concrete.

SECTION 8: CONCRETE SLABS AND PEDESTRIAN PAVEMENTS

8.1 INTERIOR SLABS-ON-GRADE

As the Plasticity Index (PI) of the surficial soils ranges up to 36, the proposed slabs-on-grade should be supported on at least 18 inches of non-expansive fill (NEF) to reduce the potential for slab damage due to soil heave. The NEF layer should be constructed over subgrade prepared in accordance with the recommendations in the “Earthwork” section of this report. If moisture-sensitive floor coverings are planned, the recommendations in the “Interior Slabs Moisture Protection Considerations” section below may be incorporated in the project design if desired. If significant time elapses between initial subgrade preparation and NEF construction, the subgrade should be proof-rolled to confirm subgrade stability.

The structural engineer should determine the appropriate slab reinforcement for the loading requirements and considering the expansion potential of the underlying soils. For unreinforced concrete slabs, ACI 302.1R recommends limiting control joint spacing to 24 to 36 times the slab thickness in each direction, or a maximum of 18 feet.

8.2 INTERIOR SLABS MOISTURE PROTECTION CONSIDERATIONS

The following general guidelines for concrete slab-on-grade construction where floor coverings are planned are presented for the consideration by the developer, design team, and contractor. These guidelines are based on information obtained from a variety of sources, including the American Concrete Institute (ACI) and are intended to reduce the potential for moisture-related problems causing floor covering failures, and may be supplemented as necessary based on project-specific requirements. The application of these guidelines or not will not affect the geotechnical aspects of the slab-on-grade performance.

- Place a minimum 10-mil vapor retarder conforming to ASTM E 1745, Class C requirements or better directly below the concrete slab; the vapor retarder should extend to the slab edges and be sealed at all seams and penetrations in accordance with manufacturer's recommendations and ASTM E 1643 requirements. A 4-inch-thick capillary break, consisting of crushed rock should be placed below the vapor retarder and consolidated in place with vibratory equipment. The mineral aggregate shall be of such size that the percentage composition by dry weight as determined by laboratory sieves will conform to the following gradation:

Sieve Size	Percentage Passing Sieve
1"	100
¾"	90 – 100
No. 4	0 - 10

  The capillary break rock may be considered as the upper 4 inches of the non-expansive fill previously recommended.

- The concrete water:cement ratio should be 0.45 or less. Mid-range plasticizers may be used to increase concrete workability and facilitate pumping and placement.

- Water should not be added after initial batching unless the slump is less than specified and/or the resulting water:cement ratio will not exceed 0.45.

- Polishing the concrete surface with metal trowels is not recommended.

- Where floor coverings are planned, all concrete surfaces should be properly cured.

- Water vapor emission levels and concrete pH should be determined in accordance with ASTM F1869-98 and F710-98 requirements and evaluated against the floor covering manufacturer's requirements prior to installation.

8.3 EXTERIOR FLATWORK

Exterior concrete flatwork subject to pedestrian and/or occasional light pick up loading should be at least 4 inches thick and supported underlain by at least 6 inches of non-expansive fill overlying subgrade prepared in accordance with the “Earthwork” recommendations of this report. Flatwork that will be subject to heavier or frequent vehicular loading should be designed in accordance with the recommendations in the “Vehicular Pavements” section below. To help reduce the potential for uncontrolled shrinkage cracking, adequate expansion and control joints should be included. Consideration should be given to limiting the control joint spacing to a maximum of about 2 feet in each direction for each inch of concrete thickness. Flatwork should be isolated from adjacent foundations.

SECTION 9: VEHICULAR PAVEMENTS

9.1 ASPHALT CONCRETE

The following asphalt concrete pavement recommendations tabulated below are based on the Procedure 608 of the Caltrans Highway Design Manual, estimated traffic indices for various pavement-loading conditions, and on a design R-value of 5. The design R-value was chosen based on the results of the laboratory testing and engineering judgment considering the variable expansive clay soil conditions.

Table 7: Asphalt Concrete Pavement Recommendations

Design Traffic Index (TI)	Asphalt Concrete (inches)	Class 2 Aggregate Base* (inches)	Total Pavement Section Thickness (inches)
4.0	2.5	8.0	10.5
4.5	2.5	10.0	12.5
5.0	3.0	10.0	13.0
5.5	3.0	12.0	14.0
6.0	3.5	13.0	16.5
6.5	4.0	14.0	18.0

*Caltrans Class 2 aggregate base; minimum R-value of 78

Frequently, the full asphalt concrete section is not constructed prior to construction traffic loading. This can result in significant loss of asphalt concrete layer life, rutting, or other pavement failures. To improve the pavement life and reduce the potential for pavement distress through construction, we recommend the full design asphalt concrete section be constructed prior to construction traffic loading. Alternatively, a higher traffic index may be chosen for the areas where construction traffic will use the pavements.

Asphalt concrete pavements constructed on expansive subgrade where the adjacent areas will not be irrigated for several months after the pavements are constructed may experience longitudinal cracking parallel to the pavement edge. Pavements constructed immediately adjacent to existing fill slopes may also experience minor cracking due to gradual creep or changes in soil moisture. These cracks typically form within a few feet of the pavement edge and are due to seasonal wetting and drying of the adjacent soil. The cracking may also occur during construction where the adjacent grade is allowed to significantly dry during the summer, pulling moisture out of the pavement subgrade. Any cracks that form should be sealed with bituminous sealant prior to the start of winter rains. One alternative to reduce the potential for this type of cracking is to install a moisture barrier at least 24 inches deep behind the pavement curb.

9.2 PORTLAND CEMENT CONCRETE

The Portland Cement Concrete (PCC) pavement recommendations outlined below are based on methods presented in ACI 330R-01 – Guide for Design and Construction of Concrete Parking Lots (2001). The following table presents minimum PCC pavements thicknesses for various traffic loading categories and an anticipated Average Daily Truck Traffic (ADTT).

Table 8: PCC Pavement Recommandations

Traffic Category	Minimum PCC Thickness (inches)
Category A – Car Parking Areas and Access Lanes	4.0
Category A-1 – Truck Access Lanes (ADTT = 1)	5.0
Category A-1 – Truck Access Lanes (ADTT = 10)	6.0
Category B – Bus Parking Area and Interior Lanes (ADTT = 25)	6.5
Category C – Bus Entrance and Exterior Lanes (ADTT = 100)	7.0

The PCC thicknesses above are based on a concrete compressive strength of at least 3,500 psi, supporting the PCC on at least 6 inches of Class 2 aggregate base compacted as recommended in the “Earthwork” section, and laterally restraining the PCC with curbs or concrete shoulders. Adequate expansion and control joints should be included. Consideration should be given to limiting the control joint spacing to a maximum of about 2 feet in each direction for each inch of concrete thickness.

9.3 STRESS PADS FOR TRASH ENCLOSURES

Pads where trash containers will be stored, and where garbage trucks will park while emptying trash containers, should be constructed on Portland Cement Concrete. We recommend that the trash enclosure pads and stress (landing) pads where garbage trucks will store, pick up, and empty trash be increased to a minimum PCC thickness of 8 inches. The compressive strength, underlayment, and construction details should be consistent with the above recommendations for PCC pavements.

9.4 PAVEMENT CUTOFF

Surface water penetration into the pavement section can significantly reduce the pavement life, due to the native expansive clays. While quantifying the life reduction is difficult, a normal 20-year pavement design could be reduced to less than 10 years; therefore, increased long-term maintenance may be required.

It would be beneficial to include a pavement cut-off, such as deepened curbs, redwood-headers, or “Deep-Root Moisture Barriers” that are keyed at least [4] inches into the pavement subgrade. This will help limit the additional long-term maintenance.

SECTION 10: RETAINING WALLS

10.1 STATIC LATERAL EARTH PRESSURES

The structural design of any site retaining wall should include resistance to lateral earth pressures that develop from the soil behind the wall, any undrained water pressure, and surcharge loads acting behind the wall. Provided a drainage system is constructed behind the wall to prevent the build-up of hydrostatic pressures as discussed in the section below, we recommend that the walls with level backfill be designed for the following pressures:

Table 9: Recommended Lateral Earth Pressures

Wall Condition	Lateral Earth Pressure*	Additional Surcharge Loads
Unrestrained – Cantilever Wall	40 pcf	⅓ of vertical loads at top of wall
Restrained – Braced Wall	40 pcf + 8H** psf	½ of vertical loads at top of wall

* Lateral earth pressures are based on an equivalent fluid pressure for level backfill conditions
** H is the distance in feet between the bottom of footing and top of retained soil

If adequate drainage cannot be provided behind the wall, an additional equivalent fluid pressure of 40 pcf should be added to the values above for both restrained and unrestrained walls for the portion of the wall that will not have drainage. Damp proofing or waterproofing of the walls may be considered where moisture penetration and/or efflorescence are not desired.

10.2 SEISMIC LATERAL EARTH PRESSURES

The 2016 CBC states that lateral pressures from earthquakes should be considered in the design of basements and retaining walls. At this time, we understand that retaining walls less than 6 feet high are planned for the project. In our opinion, design of these walls for seismic lateral earth pressures in addition to static earth pressures is not warranted.

10.3 WALL DRAINAGE

Adequate drainage should be provided by a subdrain system behind all walls. This system should consist of a 4-inch minimum diameter perforated pipe placed near the base of the wall (perforations placed downward). The pipe should be bedded and backfilled with Class 2 Permeable Material per Caltrans Standard Specifications, latest edition. The permeable backfill should extend at least 12 inches out from the wall and to within 2 feet of outside finished grade. Alternatively, ½-inch to ¾-inch crushed rock may be used in place of the Class 2 Permeable Material provided the crushed rock and pipe are enclosed in filter fabric, such as Mirafi 140N or approved equivalent. The upper 2 feet of wall backfill should consist of compacted on-site soil. The subdrain outlet should be connected to a free-draining outlet or sump.

Miradrain, Geotech Drainage Panels, or equivalent drainage matting can be used for wall drainage as an alternative to the Class 2 Permeable Material or drain rock backfill. Horizontal strip drains connecting to the vertical drainage matting may be used in lieu of the perforated pipe and crushed rock section. The vertical drainage panel should be connected to the perforated pipe or horizontal drainage strip at the base of the wall, or to some other closed or through-wall system such as the TotalDrain system from AmerDrain. Sections of horizontal drainage strips should be connected with either the manufacturer’s connector pieces or by pulling back the filter fabric, overlapping the panel dimples, and replacing the filter fabric over the connection. At corners, a corner guard, corner connection insert, or a section of crushed rock covered with filter fabric must be used to maintain the drainage path.

Drainage panels should terminate 18 to 24 inches from final exterior grade. The Miradrain panel filter fabric should be extended over the top of and behind the panel to protect it from intrusion of the adjacent soil.

10.4 BACKFILL

Where surface improvements will be located over the retaining wall backfill, such as truck dock walls, backfill placed behind the walls should be compacted to at least 95 percent relative compaction using light compaction equipment. Where no surface improvements are planned, backfill should be compacted to at least 90 percent. If heavy compaction equipment is used, the walls should be temporarily braced.

10.5 FOUNDATIONS

Retaining walls may be supported on a continuous spread footing designed in accordance with the recommendations presented in the “Foundations” section of this report.

SECTION 11: LIMITATIONS

This report, an instrument of professional service, has been prepared for the sole use of Hillsboro Properties, Inc. specifically to support the design of the Pinole Square Shopping Center project in Pinole, California. The opinions, conclusions, and recommendations presented in this report have been formulated in accordance with accepted geotechnical engineering practices that exist in Northern California at the time this report was prepared. No warranty, expressed or implied, is made or should be inferred.

Recommendations in this report are based upon the soil and ground water conditions encountered during our subsurface exploration. If variations or unsuitable conditions are encountered during construction, Cornerstone must be contacted to provide supplemental recommendations, as needed.

Hillsboro Properties, Inc. may have provided Cornerstone with plans, reports and other documents prepared by others. Hillsboro Properties, Inc. understands that Cornerstone reviewed and relied on the information presented in these documents and cannot be responsible for their accuracy.

Cornerstone prepared this report with the understanding that it is the responsibility of the owner or his representatives to see that the recommendations contained in this report are presented to other members of the design team and incorporated into the project plans and specifications, and that appropriate actions are taken to implement the geotechnical recommendations during construction.

Conclusions and recommendations presented in this report are valid as of the present time for the development as currently planned. Changes in the condition of the property or adjacent properties may occur with the passage of time, whether by natural processes or the acts of other persons. In addition, changes in applicable or appropriate standards may occur through legislation or the broadening of knowledge. Therefore, the conclusions and recommendations presented in this report may be invalidated, wholly or in part, by changes beyond Cornerstone's control. This report should be reviewed by Cornerstone after a period of three (3) years has elapsed from the date of this report. In addition, if the current project design is changed, then Cornerstone must review the proposed changes and provide supplemental recommendations, as needed.

An electronic transmission of this report may also have been issued. While Cornerstone has taken precautions to produce a complete and secure electronic transmission, please check the electronic transmission against the hard copy version for conformity.

Recommendations provided in this report are based on the assumption that Cornerstone will be retained to provide observation and testing services during construction to confirm that conditions are similar to that assumed for design, and to form an opinion as to whether the work has been performed in accordance with the project plans and specifications. If we are not retained for these services, Cornerstone cannot assume any responsibility for any potential claims that may arise during or after construction as a result of misuse or misinterpretation of Cornerstone's report by others. Furthermore, Cornerstone will cease to be the Geotechnical-Engineer-of-Record if we are not retained for these services.

SECTION 12: REFERENCES

Association of Bay Area Governments (ABAG), 2011, Interactive Liquefaction Hazard Map: http://quake.abag.ca.gov/liquefaction/

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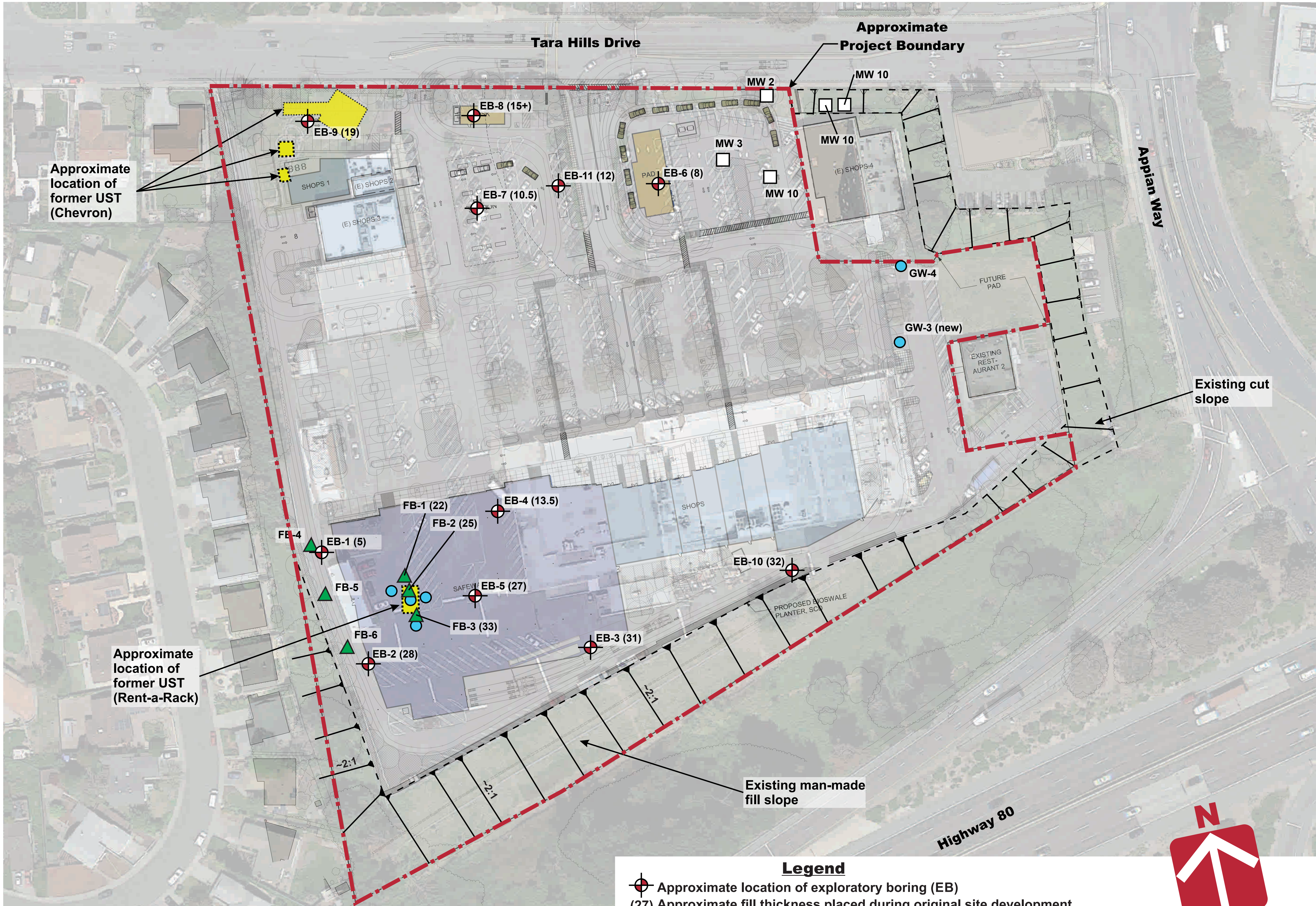
Youd, T.L. and Idriss, I.M., et al, 1997, Proceedings of the NCEER Workshop on Evaluation of Liquefaction Resistance of Soils: National Center for Earthquake Engineering Research, Technical Report NCEER - 97-0022, January 5, 6, 1996.

CORNERSTONE EARTH GROUP	**Vicinity Map**	Project Number 856-1-6	
	Appian 80 Shopping Center Pinole, CA	Figure Number Figure 1	
		Date October 2019	Drawn By RRN



Legend

- Approximate location of exploratory boring (EB)
- (27) Approximate fill thickness placed during original site development
- Approximate location of prior environmental boring (Cornerstone, 2017)
- Approximate location of prior environmental boring (Fugro, 2013)
- Approximate location of prior environmental monitoring well (MW) (West Environmental, 2014)

0 100 200
APPROXIMATE SCALE (FEET)

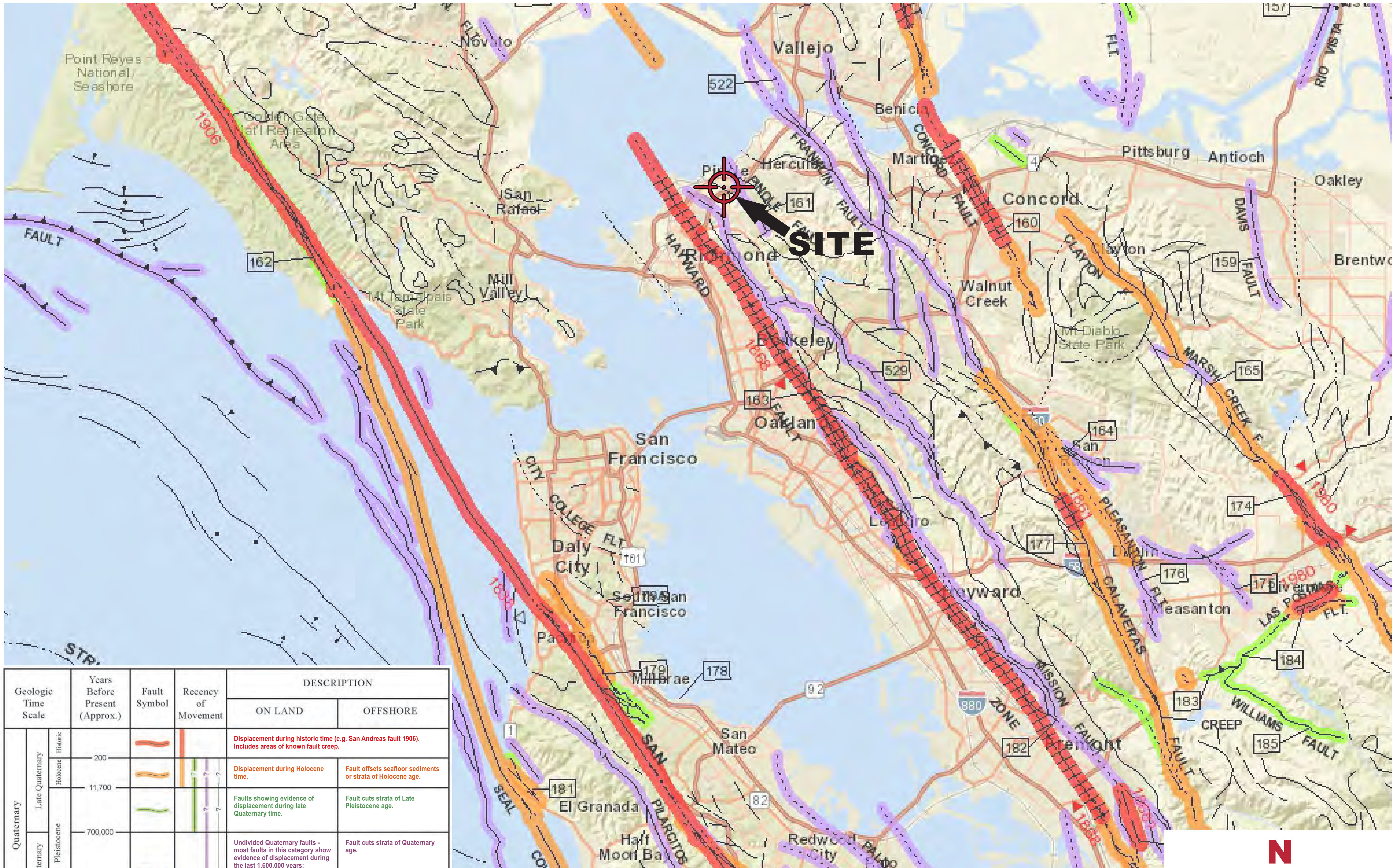
Base by Google Earth, dated 4/2/2018
Overlay by Lowney Architecture, Site Plan - A1.6, 8/30/2019

Project Number 856-1-6
Figure Number Figure 2
Drawn By RRN
Date October 2019

Site Plan

Appian 80 Shopping Center
Pinole, CA

CORNERSTONE EARTH GROUP



Geologic Time Scale			Years Before Present (Approx.)	Fault Symbol	Recency of Movement	DESCRIPTION ON LAND	DESCRIPTION OFFSHORE
Quaternary	Late Quaternary	Historic	200			Displacement during historic time (e.g. San Andreas fault 1906). Includes areas of known fault creep.	
Quaternary	Late Quaternary	Holocene	11,700			Displacement during Holocene time.	Fault offsets seafloor sediments or strata of Holocene age.
Quaternary	Late Quaternary	Pleistocene	700,000			Faults showing evidence of displacement during late Quaternary time.	Fault cuts strata of Late Pleistocene age.
Quaternary	Early Quaternary	Pleistocene	1,600,000			Undivided Quaternary faults - most faults in this category show evidence of displacement during the last 1,600,000 years; possible exceptions are faults which displace rocks of undifferentiated Pilo-Pleistocene age.	Fault cuts strata of Quaternary age.
Pre-Quaternary			4.5 billion (Age of Earth)			Faults without recognized Quaternary displacement or showing evidence of no displacement during Quaternary time. Not necessarily inactive.	Fault cuts strata of Pliocene or older age.

N

0 5 10

APPROXIMATE SCALE (MILES)

Base by California Geological Survey - 2010 Fault Activity Map of California (Jennings and Bryant, 2010)

Project Number 856-1-6

Figure Number Figure 3

Date October 2019

Drawn By RRN

Regional Fault Map

Appian 80 Shopping Center
Pinole, CA

CORNERSTONE EARTH GROUP

APPENDIX A: FIELD INVESTIGATION

The field investigation consisted of a surface reconnaissance and a subsurface exploration program using truck-mounted, hollow-stem auger drilling. Eleven (11) 8-inch-diameter exploratory borings were drilled on (date) to depths of approximately 15 to 40 feet. The approximate locations of exploratory borings are shown on the Site Plan, Figure 2. The soils encountered were continuously logged in the field by our representative and described in accordance with the Unified Soil Classification System (ASTM D2488). Boring logs, as well as a key to the classification of the soil, are included as part of this appendix.

Boring locations were approximated using existing site boundaries, a hand-held GPS unit, and other site features as references. Boring elevations were based on interpolation of plan contours were not determined. The locations and elevations of the borings should be considered accurate only to the degree implied by the method used.

Representative soil samples were obtained from the borings at selected depths. All samples were returned to our laboratory for evaluation and appropriate testing. The standard penetration resistance blow counts were obtained by dropping a 140-pound hammer through a 30-inch free fall. The 2-inch O.D. split-spoon sampler was driven 18 inches and the number of blows was recorded for each 6 inches of penetration (ASTM D1586). 2.5-inch I.D. samples were obtained using a Modified California Sampler driven into the soil with the 140-pound hammer previously described. Unless otherwise indicated, the blows per foot recorded on the boring log represent the accumulated number of blows required to drive the last 12 inches. The various samplers are denoted at the appropriate depth on the boring logs.

Field tests included an evaluation of the unconfined compressive strength of the soil samples using a pocket penetrometer device. The results of these tests are presented on the individual boring logs at the appropriate sample depths.

Attached boring logs and related information depict subsurface conditions at the locations indicated and on the date designated on the logs. Subsurface conditions at other locations may differ from conditions occurring at these boring locations. The passage of time may result in altered subsurface conditions due to environmental changes. In addition, any stratification lines on the logs represent the approximate boundary between soil types and the transition may be gradual.

UNIFIED SOIL CLASSIFICATION (ASTM D-2487-98)

MATERIAL TYPES	CRITERIA FOR ASSIGNING SOIL GROUP NAMES			GROUP SYMBOL	SOIL GROUP NAMES & LEGEND
COARSE-GRAINED SOILS >50% RETAINED ON NO. 200 SIEVE	GRAVELS >50% OF COARSE FRACTION RETAINED ON NO 4. SIEVE	CLEAN GRAVELS <5% FINES	Cu>4 AND 1<Cc<3	GW	WELL-GRADED GRAVEL
			Cu>4 AND 1>Cc>3	GP	POORLY-GRADED GRAVEL
		GRAVELS WITH FINES >12% FINES	FINES CLASSIFY AS ML OR CL	GM	SILTY GRAVEL
			FINES CLASSIFY AS CL OR CH	GC	CLAYEY GRAVEL
	SANDS >50% OF COARSE FRACTION PASSES ON NO 4. SIEVE	CLEAN SANDS <5% FINES	Cu>6 AND 1<Cc<3	SW	WELL-GRADED SAND
			Cu>6 AND 1>Cc>3	SP	POORLY-GRADED SAND
		SANDS AND FINES >12% FINES	FINES CLASSIFY AS ML OR CL	SM	SILTY SAND
			FINES CLASSIFY AS CL OR CH	SC	CLAYEY SAND
FINE-GRAINED SOILS >50% PASSES NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT<50	INORGANIC	PI>7 AND PLOTS>"A" LINE	CL	LEAN CLAY
			PI>4 AND PLOTS<"A" LINE	ML	SILT
		ORGANIC	LL (oven dried)/LL (not dried)<0.75	OL	ORGANIC CLAY OR SILT
	SILTS AND CLAYS LIQUID LIMIT>50	INORGANIC	PI PLOTS >"A" LINE	CH	FAT CLAY
			PI PLOTS <"A" LINE	MH	ELASTIC SILT
		ORGANIC	LL (oven dried)/LL (not dried)<0.75	OH	ORGANIC CLAY OR SILT
HIGHLY ORGANIC SOILS		PRIMARILY ORGANIC MATTER, DARK IN COLOR, AND ORGANIC ODOR		PT	PEAT

OTHER MATERIAL SYMBOLS

- Poorly-Graded Sand with Clay
- Clayey Sand
- Sandy Silt
- Artificial/Undocumented Fill
- Poorly-Graded Gravelly Sand
- Topsoil
- Well-Graded Gravel with Clay
- Well-Graded Gravel with Silt
- Sand
- Silt
- Well Graded Gravelly Sand
- Gravelly Silt
- Asphalt
- Boulders and Cobble

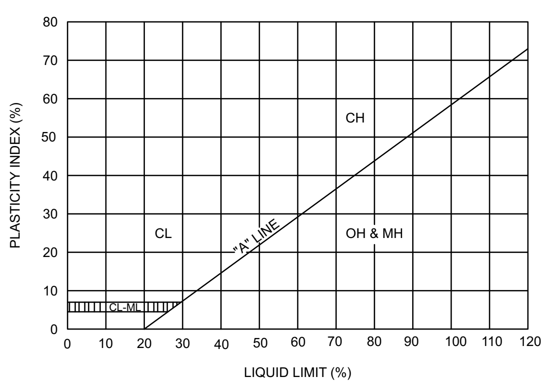
SAMPLER TYPES

- SPT
- Modified California (2.5" I.D.)
- Rock Core
- Shelby Tube
- No Recovery
- Grab Sample

ADDITIONAL TESTS

CA - CHEMICAL ANALYSIS (CORROSIVITY)
CD - CONSOLIDATED DRAINED TRIAXIAL
CN - CONSOLIDATION
CU - CONSOLIDATED UNDRAINED TRIAXIAL
DS - DIRECT SHEAR
PP - POCKET PENETROMETER (TSF)
(3.0) - (WITH SHEAR STRENGTH IN KSF)
RV - R-VALUE
SA - SIEVE ANALYSIS: % PASSING #200 SIEVE
▼ - WATER LEVEL
PI - PLASTICITY INDEX
SW SWELL TEST
TC - CYCLIC TRIAXIAL
TV - TORVANE SHEAR
UC - UNCONFINED COMPRESSION
(1.5) - (WITH SHEAR STRENGTH IN KSF)
UU - UNCONSOLIDATED UNDRAINED TRIAXIAL

PLASTICITY CHART



PENETRATION RESISTANCE (RECORDED AS BLOWS / FOOT)				
SAND & GRAVEL		SILT & CLAY		
RELATIVE DENSITY	BLOWS/FOOT*	CONSISTENCY	BLOWS/FOOT*	STRENGTH** (KSF)
VERY LOOSE	0 - 4	VERY SOFT	0 - 2	0 - 0.25
LOOSE	4 - 10	SOFT	2 - 4	0.25 - 0.5
MEDIUM DENSE	10 - 30	MEDIUM STIFF	4 - 8	0.5-1.0
DENSE	30 - 50	STIFF	8 - 15	1.0 - 2.0
VERY DENSE	OVER 50	VERY STIFF	15 - 30	2.0 - 4.0
		HARD	OVER 30	OVER 4.0

* NUMBER OF BLOWS OF 140 LB HAMMER FALLING 30 INCHES TO DRIVE A 2 INCH O.D. (1-3/8 INCH I.D.) SPLIT-BARREL SAMPLER THE LAST 12 INCHES OF AN 18-INCH DRIVE (ASTM-1586 STANDARD PENETRATION TEST).

** UNDRAINED SHEAR STRENGTH IN KIPS/SQ. FT. AS DETERMINED BY LABORATORY TESTING OR APPROXIMATED BY THE STANDARD PENETRATION TEST, POCKET PENETROMETER, TORVANE, OR VISUAL OBSERVATION.

CORNERSTONE EARTH GROUP	LEGEND TO SOIL DESCRIPTIONS	Figure Number A-1

BORING NUMBER EB-1

CORNERSTONE EARTH GROUP

PROJECT NAME Appian 80 Shopping Center
PROJECT NUMBER 856-1-6
PROJECT LOCATION Pinole, CA
DATE STARTED 10/8/19 **DATE COMPLETED** 10/8/19
GROUND ELEVATION **BORING DEPTH** 15 ft.
DRILLING CONTRACTOR Geoservices Exploration Inc.
LATITUDE 37.99445° **LONGITUDE** -122.30577°
DRILLING METHOD Mobile B-53, 8 inch Hollow-Stem Auger
GROUNDWATER LEVELS:
LOGGED BY BCG
AT TIME OF DRILLING Not Encountered
NOTES
AT END OF DRILLING Not Encountered

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ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE	UNDRAINED SHEAR STRENGTH, ksf (○ HAND PENETROMETER; △ TORVANE; ● UNCONFINED COMPRESSION; ▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL) 1.0 2.0 3.0 4.0
	0		3 inches asphalt concrete over 3 inches aggregate base							
			Sandy Lean Clay (CL) [Fill] very stiff, moist, brown with dark brown mottles, fine to medium sand, some fine to coarse sandstone gravel, moderate plasticity	35	MC-1B	93	26			○ 3.0
				50 5"	MC-2B	95	23			○ ~3.5
	5		**Sandy Siltstone [Tcgl]** low hardness, friable, deep weathering, brown to light brown, fine sand, low plasticity	50 5"	MC					
			Silty Sandstone [Tcgl] low hardness, friable, deep weathering, brown to light brown, fine sand	56	SPT-4		14			
	10									
			Sandy Siltstone [Tcgl] low hardness, friable, deep weathering, brown to light brown, fine sand, low plasticity	51	SPT-5		19			
	15		Bottom of Boring at 15.0 feet.							
	20									
	25									

BORING NUMBER EB-2

CORNERSTONE EARTH GROUP

PROJECT NAME Appian 80 Shopping Center
PROJECT NUMBER 856-1-6
PROJECT LOCATION Pinole, CA
DATE STARTED 10/9/19 **DATE COMPLETED** 10/9/19
GROUND ELEVATION **BORING DEPTH** 40 ft.
DRILLING CONTRACTOR Geoservices Exploration Inc.
LATITUDE 37.99397° **LONGITUDE** -122.30567°
DRILLING METHOD Mobile B-53, 8 inch Hollow-Stem Auger
GROUNDWATER LEVELS:
LOGGED BY BCG
∇ **AT TIME OF DRILLING** Not Encountered
NOTES
▼ **AT END OF DRILLING** Not Encountered

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UNDRAINED SHEAR STRENGTH, ksf: ○ HAND PENETROMETER; △ TORVANE; ● UNCONFINED COMPRESSION; ▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL (scale 1.0, 2.0, 3.0, 4.0)

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE	UNDRAINED SHEAR STRENGTH, ksf
	0	3 inches asphalt concrete over 3 inches aggregate base							
		Lean Clay with Sand (CL) [Fill] very stiff, moist, brown with gray mottles, fine to medium sand, some fine to coarse sandstone gravel, moderate plasticity	45	MC-1B	91	28			○ 2.0
		Liquid Limit = 38, Plastic Limit = 18	55	MC-2B	85	31	20		○ 3.0
	5	**Clayey Sand (SC) [Fill]** medium dense, moist, brown to grayish brown, fine to medium sand, some fine to coarse sandstone gravel	38	MC-3B	97	23		34	
	10	**Sandy Lean Clay (CL) [Fill]** very stiff, moist, gray with dark gray mottles, fine to medium sand, some fine to coarse sandstone gravel, moderate plasticity	48	MC-4B	95	28			
	15	**Lean Clay with Sand (CL) [Fill]** very stiff, moist, dark brown with reddish brown mottles, fine to medium sand, some fine to coarse sandstone gravel, moderate plasticity	50/6"	MC-5B	74	41			○ 3.0
	20	**Clayey Sand (SC) [Fill]** very dense, moist, brown to grayish brown, fine to medium sand, some fine siltstone gravel	50/6"	MC					
	25	**Sandy Lean Clay (CL) [Fill]** stiff, moist, gray with dark gray mottles, fine to coarse sand, some fine to coarse siltstone gravel, moderate plasticity	29	SPT-7		58			○ 1.5

Continued Next Page

BORING NUMBER EB-2

CORNERSTONE EARTH GROUP

PROJECT NAME Appian 80 Shopping Center

PROJECT NUMBER 856-1-6

PROJECT LOCATION Pinole, CA

UNDRAINED SHEAR STRENGTH, ksf: ○ HAND PENETROMETER; △ TORVANE; ● UNCONFINED COMPRESSION; ▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL (scale 1.0, 2.0, 3.0, 4.0)

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE	UNDRAINED SHEAR STRENGTH, ksf
		Fat Clay (CH) [Residual soil] very stiff, moist, dark gray, some fine sand, high plasticity	65	MC					○ (~2.5)
	30								
		Sandy Siltstone [Tcgl] low hardness, friable, deep weathering, brown to light brown, fine sand, low plasticity	50/6"	MC-9B	110	17			
	35								
			80	SPT					
	40	Bottom of Boring at 40.0 feet.							
	45								
	50								
	55								

BORING NUMBER EB-3

CORNERSTONE EARTH GROUP

PROJECT NAME Appian 80 Shopping Center
PROJECT NUMBER 856-1-6
PROJECT LOCATION Pinole, CA

DATE STARTED 10/8/19 **DATE COMPLETED** 10/8/19
DRILLING CONTRACTOR Geoservices Exploration Inc.
DRILLING METHOD Mobile B-53, 8 inch Hollow-Stem Auger
LOGGED BY BCG
NOTES

GROUND ELEVATION **BORING DEPTH** 35.5 ft.
LATITUDE 37.99399° **LONGITUDE** -122.30489°
GROUNDWATER LEVELS:
AT TIME OF DRILLING Not Encountered
AT END OF DRILLING Not Encountered

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UNDRAINED SHEAR STRENGTH, ksf: ○ HAND PENETROMETER; △ TORVANE; ● UNCONFINED COMPRESSION; ▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL (scale 1.0, 2.0, 3.0, 4.0)

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE
	0	3 inches asphalt concrete over 3 inches aggregate base						
		Fat Clay with Sand (CH) [Fill] very stiff, moist, dark brown with light brown mottles, fine to medium sand, some fine to coarse sandstone gravel, high plasticity Liquid Limit = 51, Plastic Limit = 22	33	MC-1B	76	36	29	
		Lean Clay with Sand (CL) [Fill] very stiff, moist, brown with gray mottles, fine to medium sand, some fine to coarse sandstone gravel, moderate plasticity	33	MC-2B	84	31		
	5		58	MC-3B	88	35		
			44	MC-4B	86	31		
	10							
		Sandy Lean Clay (CL) [Fill] very stiff, moist, brown with gray mottles, fine to medium sand, some fine to coarse sandstone gravel, moderate plasticity	36	MC-5A	72	42		
	15		41	SPT				
		Fat Clay with Sand (CH) [Fill] very stiff, moist, dark brown with brown mottles, fine to medium sand, some fine to coarse sandstone gravel, high plasticity	74	MC-7B	87	32		
	20							
		Sandy Lean Clay (CL) [Fill] very stiff, moist, light brown, fine to medium sand, some fine to coarse sandstone gravel, moderate plasticity	50/6"	MC				
	25							

Continued Next Page

BORING NUMBER EB-3

CORNERSTONE EARTH GROUP

PROJECT NAME Appian 80 Shopping Center

PROJECT NUMBER 856-1-6

PROJECT LOCATION Pinole, CA

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UNDRAINED SHEAR STRENGTH, ksf: ○ HAND PENETROMETER; △ TORVANE; ● UNCONFINED COMPRESSION; ▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL (scale 1.0, 2.0, 3.0, 4.0)

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE	UNDRAINED SHEAR STRENGTH, ksf
		Sandy Lean Clay (CL) [Fill] very stiff, moist, light brown, fine to medium sand, some fine to coarse sandstone gravel, moderate plasticity							
			55	MC-9B	61	61			○
	30								
			40	SPT					○
		Fat Clay (CH) [Residual soil] very stiff, moist, dark gray, some fine sand, high plasticity							
		Sandy Siltstone [Tcgl] low hardness, friable, deep weathering, brown to light brown, fine sand, low plasticity							
			50/5"	MC					
	35		50/6"	SPT-12		22			
		Bottom of Boring at 35.5 feet.							
	40								
	45								
	50								
	55								

BORING NUMBER EB-4

CORNERSTONE EARTH GROUP

PROJECT NAME Appian 80 Shopping Center
PROJECT NUMBER 856-1-6
PROJECT LOCATION Pinole, CA

DATE STARTED 10/9/19 **DATE COMPLETED** 10/9/19
DRILLING CONTRACTOR Geoservices Exploration Inc.
DRILLING METHOD Mobile B-53, 8 inch Hollow-Stem Auger
LOGGED BY BCG
NOTES

GROUND ELEVATION **BORING DEPTH** 27.5 ft.
LATITUDE 37.99444° **LONGITUDE** -122.30510°
GROUNDWATER LEVELS:
▽ **AT TIME OF DRILLING** Not Encountered
▼ **AT END OF DRILLING** Not Encountered

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Undrained shear strength, ksf: ○ Hand Penetrometer; △ Torvane; ● Unconfined Compression; ▲ Unconsolidated-Undrained Triaxial (scale 1.0, 2.0, 3.0, 4.0)

Elevation (ft)	Depth (ft)	DESCRIPTION	N-Value (uncorrected) blows per foot	Samples Type and Number	Dry Unit Weight PCF	Natural Moisture Content	Plasticity Index, %	Percent Passing No. 200 Sieve	Undrained Shear Strength, ksf
	0	3 inches asphalt concrete over 8 inches aggregate base							
		Sandy Lean Clay (CL) [Fill] very stiff, moist, gray with light brown mottles, fine to medium sand, some fine to coarse gravel, moderate plasticity	33	MC-1B	93	28			
			41	MC-2B	88	29			
	5	**Sandy Silt (ML) [Fill]** very stiff, moist, brown with gray mottles, fine to medium sand, some fine to coarse sandstone gravel, low plasticity	28	MC-3B	79	40			
	10		34	MC					
	15	**Fat Clay (CH) [Residual soil]** very stiff, moist, dark gray, some fine sand, high plasticity	35	MC-5B	91	26			
	20	becomes hard	56	MC					>4.5
	25	**Sandy Claystone [Tcgl]** soft, plastic, deep weathering, brown, fine sand, moderate plasticity	51	MC-7B	95	26			
		Sandy Siltstone [Tcgl] low hardness, friable, deep weathering, brown to light brown, fine sand, low plasticity	50 6"	SPT					

Bottom of Boring at 27.5 feet.

BORING NUMBER EB-5

CORNERSTONE EARTH GROUP

PROJECT NAME Appian 80 Shopping Center
PROJECT NUMBER 856-1-6
PROJECT LOCATION Pinole, CA

DATE STARTED 10/8/19 **DATE COMPLETED** 10/8/19
GROUND ELEVATION **BORING DEPTH** 35 ft.
DRILLING CONTRACTOR Geoservices Exploration Inc.
LATITUDE 37.99421° **LONGITUDE** -122.30526°
DRILLING METHOD Mobile B-53, 8 inch Hollow-Stem Auger
GROUNDWATER LEVELS:
LOGGED BY BCG
▽ **AT TIME OF DRILLING** Not Encountered
NOTES
▼ **AT END OF DRILLING** Not Encountered

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UNDRAINED SHEAR STRENGTH, ksf: ○ HAND PENETROMETER; △ TORVANE; ● UNCONFINED COMPRESSION; ▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL (scale 1.0, 2.0, 3.0, 4.0)

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE
	0	3 inches asphalt concrete over 3 inches aggregate base						
		Sandy Silt (ML) [Fill] very stiff, moist, brown with gray mottles, fine to medium sand, some fine to coarse sandstone gravel, low plasticity	35	MC-1B	94	25		
			41	MC-2B	87	28		
	5	**Fat Clay with Sand (CH) [Fill]** stiff, moist, dark brown with light brown mottles, fine to medium sand, some fine to coarse sandstone gravel, high plasticity	37	MC-3B	75	46		
		Sandy Lean Clay (CL) [Fill] very stiff, moist, gray with brown mottles, fine to medium sand, some fine to coarse sandstone gravel, moderate plasticity	43	MC-4B	94	28		
	10							
		Clayey Sand (SC) [Fill] very dense, moist, brown to grayish brown, fine to medium sand, some fine to coarse subangular to subrounded sandstone gravel	37	MC-5B	101	16		
	15							
		Sandy Lean Clay (CL) [Fill] stiff, moist, dark brown and light brown mottled, fine to medium sand, some fine to coarse sandstone gravel, moderate plasticity	42	MC				
	20							
			44	MC-7B	85	30		
	25							

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CORNERSTONE EARTH GROUP

PROJECT NAME Appian 80 Shopping Center
PROJECT NUMBER 856-1-6
PROJECT LOCATION Pinole, CA

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UNDRAINED SHEAR STRENGTH, ksf: ○ HAND PENETROMETER; △ TORVANE; ● UNCONFINED COMPRESSION; ▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL (scale 1.0, 2.0, 3.0, 4.0)

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE	UNDRAINED SHEAR STRENGTH, ksf
	27–32	**Fat Clay (CH) [Residual soil]** very stiff, moist, dark gray, some fine sand, high plasticity	50/6"	MC					○ (~4.0)
	32–35	**Sandy Claystone [Tcgl]** soft, plastic, deep weathering, brown, fine sand, moderate plasticity	77	MC-9B	104	21			>4.5 ○
	35	Bottom of Boring at 35.0 feet.							

Depth scale: 30, 35, 40, 45, 50, 55

BORING NUMBER EB-6

CORNERSTONE EARTH GROUP

PROJECT NAME Appian 80 Shopping Center
PROJECT NUMBER 856-1-6
PROJECT LOCATION Pinole, CA

DATE STARTED 10/9/19 **DATE COMPLETED** 10/9/19
GROUND ELEVATION **BORING DEPTH** 20 ft.
DRILLING CONTRACTOR Geoservices Exploration Inc.
LATITUDE 37.99524° **LONGITUDE** -122.30423°
DRILLING METHOD Mobile B-53, 8 inch Hollow-Stem Auger
GROUNDWATER LEVELS:
LOGGED BY BCG
▽ **AT TIME OF DRILLING** Not Encountered
NOTES
▼ **AT END OF DRILLING** Not Encountered

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UNDRAINED SHEAR STRENGTH, ksf: ○ HAND PENETROMETER; △ TORVANE; ● UNCONFINED COMPRESSION; ▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL (scale 1.0, 2.0, 3.0, 4.0)

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE	UNDRAINED SHEAR STRENGTH, ksf
	0	2 inches asphalt concrete over 2 inches aggregate base							
		Lean Clay with Sand (CL) [Fill] very stiff, moist, dark brown with gray mottles, fine to medium sand, some fine to coarse sandstone gravel, moderate plasticity	40	MC-1B	91	30			○
			61	MC-2B	81	33			○
	5	**Fat Clay with Sand (CH) [Fill]** very stiff, moist, dark brown with light brown mottles, fine to medium sand, some fine to coarse sandstone gravel, high plasticity	23	MC-3B	85	24			○
		Fat Clay (CH) [Residual soil] very stiff, moist, dark gray, some fine sand, high plasticity	66	MC-4B	95	23			○
	10								
		Sandy Claystone [Tcgl] soft, plastic, deep weathering, brown, fine sand, moderate plasticity	50/6"	MC-5B	107	19			>4.5 ○
	15								
			69	SPT					>4.5 ○
	20	Bottom of Boring at 20.0 feet.							
	25								

BORING NUMBER EB-7

CORNERSTONE EARTH GROUP

PROJECT NAME Appian 80 Shopping Center

PROJECT NUMBER 856-1-6

PROJECT LOCATION Pinole, CA

DATE STARTED 10/8/19 **DATE COMPLETED** 10/8/19

GROUND ELEVATION **BORING DEPTH** 20.4 ft.

DRILLING CONTRACTOR Geoservices Exploration Inc.

LATITUDE 37.99530° **LONGITUDE** -122.30489°

DRILLING METHOD Mobile B-53, 8 inch Hollow-Stem Auger

GROUNDWATER LEVELS:

LOGGED BY BCG

▽ **AT TIME OF DRILLING** Not Encountered

NOTES

▼ **AT END OF DRILLING** Not Encountered

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UNDRAINED SHEAR STRENGTH, ksf: ○ HAND PENETROMETER; △ TORVANE; ● UNCONFINED COMPRESSION; ▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL (scale 1.0, 2.0, 3.0, 4.0)

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE	UNDRAINED SHEAR STRENGTH, ksf
	0	2 inches asphalt concrete over 3 inches aggregate base							
		Lean Clay with Sand (CL) [Fill] hard, moist, brown with gray mottles, fine to medium sand, some fine to coarse sandstone gravel, moderate plasticity	73	MC-1B	86	30			>4.5
		Fat Clay with Sand (CH) [Fill] hard, moist, dark brown with light brown mottles, fine to medium sand, some fine to coarse sandstone gravel, high plasticity	49	MC-2B	68	50			>4.5
	5	**Lean Clay with Sand (CL) [Fill]** very stiff to hard, moist, gray with brown mottles, fine to medium sand, some fine to coarse sandstone gravel, moderate plasticity	45	MC-3B	82	36			
			35	MC-4B	88	31			>4.5
	10	**Fat Clay (CH) [Residual soil]** very stiff, moist, dark gray, some fine sand, high plasticity							
		Sandy Claystone [Tcgl] soft, plastic, deep weathering, brown, fine sand, moderate plasticity	59	MC-5B	82	39			
	15	**Claystone [Tcgl]** low hardness, friable, deep weathering, brown to light brown, fine sand, high plasticity							
			50 / 6"	MC-6	90	31			>4.5
	20		50 / 5"	SPT					>4.5
		Bottom of Boring at 20.4 feet.							
	25								

BORING NUMBER EB-8

CORNERSTONE EARTH GROUP

PROJECT NAME: Appian 80 Shopping Center
PROJECT NUMBER: 856-1-6
PROJECT LOCATION: Pinole, CA

DATE STARTED: 10/8/19 DATE COMPLETED: 10/8/19
DRILLING CONTRACTOR: Geoservices Exploration Inc.
DRILLING METHOD: Mobile B-53, 8 inch Hollow-Stem Auger
LOGGED BY: BCG
NOTES:

GROUND ELEVATION: BORING DEPTH: 15 ft.
LATITUDE: 37.99556° LONGITUDE: -122.30481°
GROUNDWATER LEVELS:
AT TIME OF DRILLING: Not Encountered
AT END OF DRILLING: Not Encountered

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UNDRAINED SHEAR STRENGTH, ksf: ○ HAND PENETROMETER; △ TORVANE; ● UNCONFINED COMPRESSION; ▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL (scale 1.0, 2.0, 3.0, 4.0)

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE
	0	3 inches asphalt concrete over 6 inches aggregate base						
		Sandy Lean Clay (CL) [Fill] very stiff, moist, light brown to brown, fine to medium sand, some fine to coarse sandstone gravel, moderate plasticity	50/6"	MC-1B	83	27		
			50/6"	MC				
	4	**Clayey Sand with Gravel (SC) [Fill]** dense to very dense, moist, brown with gray mottles, fine to medium sand, fine to coarse sandstone gravel						
	5		50	SPT-3		24		
			47	SPT				
	10							
			45	SPT-5		38		
	15	Bottom of Boring at 15.0 feet.						
	20							
	25							

BORING NUMBER EB-9

CORNERSTONE EARTH GROUP

PROJECT NAME Appian 80 Shopping Center
PROJECT NUMBER 856-1-6
PROJECT LOCATION Pinole, CA

DATE STARTED 10/9/19 **DATE COMPLETED** 10/9/19
GROUND ELEVATION **BORING DEPTH** 25 ft.
DRILLING CONTRACTOR Geoservices Exploration Inc.
LATITUDE 37.99571° **LONGITUDE** -122.30541°
DRILLING METHOD Mobile B-53, 8 inch Hollow-Stem Auger
GROUNDWATER LEVELS:
LOGGED BY BCG
∇ **AT TIME OF DRILLING** Not Encountered
NOTES
▼ **AT END OF DRILLING** Not Encountered

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UNDRAINED SHEAR STRENGTH, ksf: ○ HAND PENETROMETER; △ TORVANE; ● UNCONFINED COMPRESSION; ▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL (scale 1.0, 2.0, 3.0, 4.0)

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE	UNDRAINED SHEAR STRENGTH, ksf
	0	**Clayey Sand with Gravel (SC) [Fill]** very dense, moist, light brown, fine to medium sand, fine to coarse subangular to subrounded sandstone gravel	50/6"	MC-1B	83	22			
	3	**Sandy Lean Clay (CL) [Fill]** hard, moist, light brown, fine to medium sand, some fine to coarse sandstone gravel, moderate plasticity	78	MC-2B	92	24			○ >4.5
	5		23	SPT-3		31			
	8	**Fat Clay with Sand (CH) [Fill]** very stiff, moist, dark brown with light brown mottles, fine to medium sand, some fine to coarse sandstone gravel, high plasticity							
	10		19	SPT					
	12		26	SPT-5		40			
	13	**Lean Clay with Sand (CL) [Fill]** very stiff, moist, light brown with dark brown mottles, fine to medium sand, some fine to coarse sandstone gravel, moderate plasticity							
	15		37	SPT					
	19	**Fat Clay (CH) [Residual soil]** very stiff, moist, dark gray, some fine sand, high plasticity	29	SPT-7B		21			○
	22	**Silty Sandstone [Tcgl]** low hardness, friable, deep weathering, brown to light brown, fine sand							
	25		77	SPT					

Bottom of Boring at 25.0 feet.

BORING NUMBER EB-10

CORNERSTONE EARTH GROUP

PROJECT NAME Appian 80 Shopping Center
PROJECT NUMBER 856-1-6
PROJECT LOCATION Pinole, CA

DATE STARTED 10/9/19 **DATE COMPLETED** 10/9/19
GROUND ELEVATION **BORING DEPTH** 35 ft.
DRILLING CONTRACTOR Geoservices Exploration Inc.
LATITUDE 37.99406° **LONGITUDE** -122.30411°
DRILLING METHOD Mobile B-53, 8 inch Hollow-Stem Auger
GROUNDWATER LEVELS:
LOGGED BY BCG
▽ **AT TIME OF DRILLING** Not Encountered
NOTES
▼ **AT END OF DRILLING** Not Encountered

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UNDRAINED SHEAR STRENGTH, ksf: ○ HAND PENETROMETER; △ TORVANE; ● UNCONFINED COMPRESSION; ▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL (scale 1.0, 2.0, 3.0, 4.0)

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE	UNDRAINED SHEAR STRENGTH, ksf
	0	6 inches asphalt concrete							
		Fat Clay with Sand (CH) [Fill] very stiff, moist, dark brown with light brown mottles, fine to medium sand, some fine to coarse sandstone gravel, high plasticity Liquid Limit = 51, Plastic Limit = 15	53	MC-1B	91	27	36		○ 3.0
			49	MC-2B	82	31			○ 3.0
	5		62	MC-3B	85	33			○ 3.0
		Lean Clay with Sand (CL) [Fill] very stiff, moist, dark brown with brown mottles, fine to medium sand, some fine to coarse sandstone gravel, moderate plasticity	58	MC-4B	83	35			○ 2.5
	10								
		Sandy Lean Clay (CL) [Fill] very stiff, moist, light brown, fine to medium sand, some fine to coarse sandstone gravel, moderate plasticity	50/5"	MC-5B	82	33			○ 4.0
	15								
		Lean Clay with Sand (CL) [Fill] very stiff, moist, dark brown with brown mottles, fine to medium sand, some fine to coarse sandstone gravel, moderate plasticity	34	SPT					○ 2.5
	20								
			58	SPT-7		37			○ 3.0
	25								

Continued Next Page

CORNERSTONE EARTH GROUP

PROJECT NAME Appian 80 Shopping Center
PROJECT NUMBER 856-1-6
PROJECT LOCATION Pinole, CA

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UNDRAINED SHEAR STRENGTH, ksf: ○ HAND PENETROMETER; △ TORVANE; ● UNCONFINED COMPRESSION; ▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL (scale 1.0, 2.0, 3.0, 4.0)

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE	UNDRAINED SHEAR STRENGTH, ksf
		Lean Clay with Sand (CL) [Fill] very stiff, moist, dark brown with brown mottles, fine to medium sand, some fine to coarse sandstone gravel, moderate plasticity	48	SPT					○
	30								
		Fat Clay (CH) [Residual soil] very stiff, moist, dark gray, some fine sand, high plasticity	26	SPT					○
	35	**Sandy Claystone [Tcgl]** soft, plastic, deep weathering, brown, fine sand, moderate plasticity							
		Bottom of Boring at 35.0 feet.							
	40								
	45								
	50								
	55								

BORING NUMBER EB-11

CORNERSTONE EARTH GROUP

PROJECT NAME Appian 80 Shopping Center

PROJECT NUMBER 856-1-6

PROJECT LOCATION Pinole, CA

DATE STARTED 10/8/19 **DATE COMPLETED** 10/8/19

GROUND ELEVATION **BORING DEPTH** 15 ft.

DRILLING CONTRACTOR Geoservices Exploration Inc.

LATITUDE 37.99531° **LONGITUDE** -122.30457°

DRILLING METHOD Mobile B-53, 8 inch Hollow-Stem Auger

GROUNDWATER LEVELS:

LOGGED BY BCG

∇ **AT TIME OF DRILLING** Not Encountered

NOTES

▼ **AT END OF DRILLING** Not Encountered

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UNDRAINED SHEAR STRENGTH, ksf: ○ HAND PENETROMETER; △ TORVANE; ● UNCONFINED COMPRESSION; ▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL (scale 1.0, 2.0, 3.0, 4.0)

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE
	0	3 inches asphalt concrete over 4 inches aggregate base						
		Lean Clay with Sand (CL) [Fill] very stiff, moist, dark brown with gray mottles, fine to medium sand, some fine to coarse sandstone gravel, moderate plasticity	51	MC-1B	94	26		
			60	MC-2B	86	28		
	5		42	MC-3B	84	29		
		Sandy Fat Clay (CH) [Fill] very stiff, moist, dark brown with light brown mottles, fine to medium sand, some fine to coarse siltstone gravel, high plasticity	33	MC-4B	72	37		
	10							
		Fat Clay (CH) [Residual soil] very stiff, moist, dark gray, some fine sand, high plasticity						
		Sandy Claystone [Tcgl] soft, plastic, deep weathering, brown, fine sand, moderate plasticity	60	MC-5B	109	18		
	15	Bottom of Boring at 15.0 feet.						
	20							
	25							

APPENDIX B: LABORATORY TEST PROGRAM

The laboratory testing program was performed to evaluate the physical and mechanical properties of the soils retrieved from the site to aid in verifying soil classification.

Moisture Content: The natural water content was determined (ASTM D2216) on 59 samples of the materials recovered from the borings. These water contents are recorded on the boring logs at the appropriate sample depths.

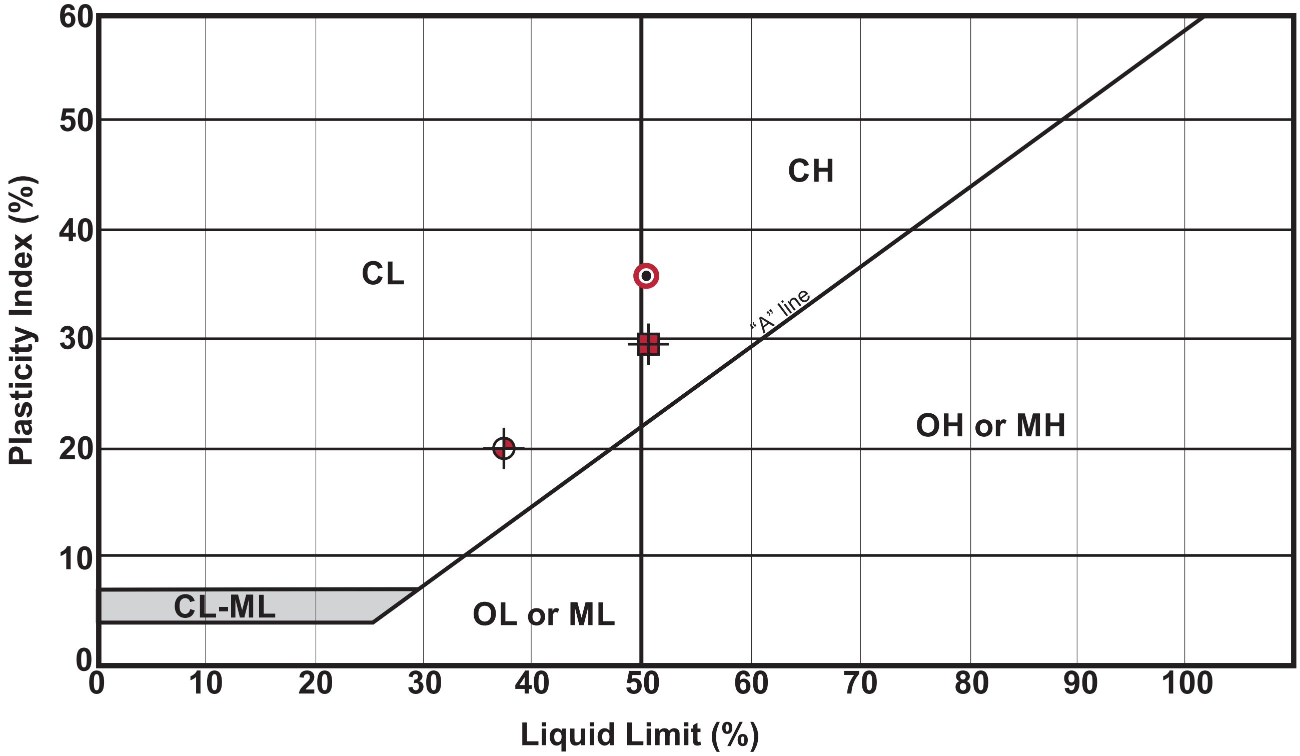
Dry Densities: In place dry density determinations (ASTM D2937) were performed on 49 samples to measure the unit weight of the subsurface soils. Results of these tests are shown on the boring logs at the appropriate sample depths.

Washed Sieve Analyses: The percent soil fraction passing the No. 200 sieve (ASTM D1140) was determined on one sample of the subsurface soils to aid in the classification of these soils. Results of these tests are shown on the boring logs at the appropriate sample depths.

Plasticity Index: Three Plasticity Index determinations (ASTM D4318) were performed on samples of the subsurface soils to measure the range of water contents over which this material exhibits plasticity. The Plasticity Index was used to classify the soil in accordance with the Unified Soil Classification System and to evaluate the soil expansion potential. Results of these tests are shown on the boring logs at the appropriate sample depths.

Undrained-Unconsolidated Triaxial Shear Strength: The undrained shear strength was determined on two relatively undisturbed sample(s) by unconsolidated-undrained triaxial shear strength testing (ASTM D2850). The results of this test are included as part of this appendix.

Plasticity Index (ASTM D4318) Testing Summary



Symbol	Boring No.	Depth (ft)	Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index	Passing No. 200 (%)	Group Name (USCS - ASTM D2487)
	EB-2	4.0	31	38	18	20	—	Lean Clay with Sand (CL) [Fill]
	EB-3	2.0	36	51	22	29	—	Fat Clay with Sand (CH) [Fill]
	EB-10	2.0	27	51	15	36	—	Fat Clay with Sand (CH) [Fill]

CORNERSTONE EARTH GROUP

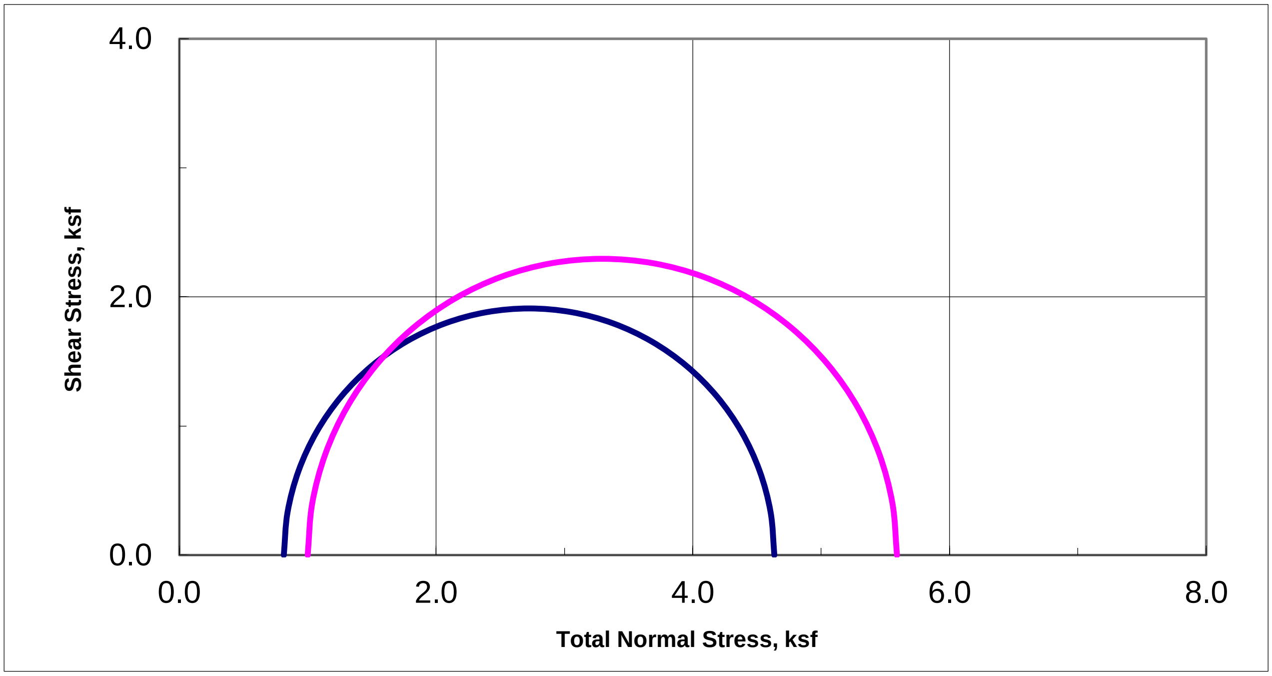
Plasticity Index Testing Summary	Project Number 856-1-6
Appian 80 Shopping Center Pinole, CA	Figure Number Figure B1
	Date October 2019 / Drawn By FLL

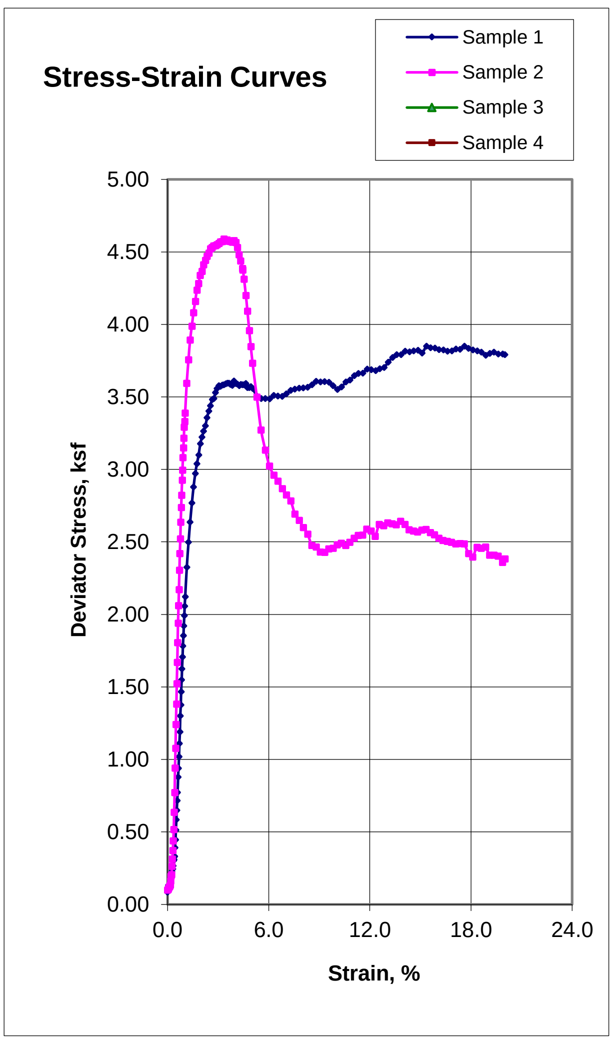
Cooper Testing Labs, Inc.
937 Commercial Street
Palo Alto, CA 94303

COOPER TESTING LABORATORY

Unconsolidated-Undrained Triaxial Test

ASTM D2850





Sample Data	1	2	3	4
Moisture %	30.5	38.9		
Dry Den,pcf	88.1	81.8		
Void Ratio	0.912	1.061		
Saturation %	90.1	99.1		
Height in	5.03	5.01		
Diameter in	2.39	2.41		
Cell psi	5.7	6.9		
Strain %	15.00	3.34		
Deviator, ksf	3.822	4.591		
Rate %/min	1.00	1.00		
in/min	0.050	0.050		
Job No.:	640-1358			
Client:	Cornerstone Earth Group			
Project:	856-1-6			
Boring:	EB-7	EB-7		
Sample:	4B	5B		
Depth ft:	9.5	14.0		

Visual Soil Description

Sample #	
1	Dark Olive Gray Clayey GRAVEL w/ Sand
2	Olive Brown Sandy CLAY
3	
4	

Remarks:

Note: Strengths are picked at the peak deviator stress or 15% strain which ever occurs first per ASTM D2850.

APPENDIX C: SITE CORROSIVITY EVALUATION

JDH CORROSION CONSULTANTS REPORT DATED OCTOBER 30, 2019

October 30, 2019

Cornerstone Earth Group, Inc.
1220 Oakland Blvd, Suite 220
Walnut Creek, California 94596

Attention: **John R. Dye, P.E., G.E.**
Principal Engineer

Subject: **Site Corrosivity Evaluation**
Pinole Square Shopping Center
Pinole, CA
Project: 856-1-6

Dear John,

In accordance with your request, we have reviewed the laboratory soils data for the above referenced project site. Our evaluation of these results and our corresponding recommendations for corrosion control for the above referenced project foundations and buried site utilities are presented herein for your consideration.

Soil Testing & Analysis

Soil Chemical Analysis

Four (4) soil samples from the project site were chemically analyzed for corrosivity by **Cooper Testing Laboratories**. Each sample was analyzed for chloride and sulfate concentration, pH, resistivity at 100% saturation and moisture percentage. The test results are presented in Cooper Testing Laboratories Corrosivity Test Summary dated 10/22/2019. The results of the chemical analysis were as follows:

Soil Laboratory Analysis

Chemical Analysis	Range of Results	Corrosion Classification*
Chlorides	2 – 10 mg/kg	Non-corrosive*
Sulfates	12 – 66 mg/kg	Non-corrosive**
pH	7.6 – 8.1	Non-corrosive*
Moisture (%)	13.0 – 36.3 %	Not-applicable
Resistivity at 100% Saturation	1,044 – 1,699 ohm-cm	**Corrosive***

* With respect to bare steel or ductile iron.
** With respect to mortar coated steel

Discussion

Reinforced Concrete Foundations

Due to the low levels of water-soluble sulfates found in these soils, there is no special requirement for sulfate resistant concrete to be used at this site. The type of cement used should be in accordance with California Building Code (CBC) for soils which have less than 0.10 percent by weight of water soluble sulfate (SO_4) in soil and the minimum depth of cover for the reinforcing steel should be as specified in CBC as well.

Underground Metallic Pipelines

The soils at the project site are generally considered to be “corrosive” to ductile/cast iron, steel and dielectric coated steel based on the saturated resistivity measurements. Therefore, special requirements for corrosion control are required for buried metallic utilities at this site depending upon the critical nature of the piping. Pressure piping systems such as domestic and fire water should be provided with appropriate coating systems and cathodic protection, where warranted. In addition, all underground pipelines should be electrically isolated from above grade structures, reinforced concrete structures and copper lines in order to avoid potential galvanic corrosion problems.

LIMITATIONS

The conclusions and recommendations contained in this report are based on the information and assumptions referenced herein. All services provided herein were performed by persons who are experienced and skilled in providing these types of services and in accordance with the standards of workmanship in this profession. No other warrantees or guarantees, expressed or implied, is provided.

We thank you for the opportunity to be of service to **Cornerstone Earth Group** on this project and trust that you find the enclosed information satisfactory. If you have any questions, or if we can be of any additional assistance, please feel free to contact us at (925) 927-6630.

Respectfully submitted,

Brendon Hurley

Brendon Hurley
JDH Corrosion Consultants, Inc.
Field Technician

Mohammed Ali

Mohammed Ali, P.E.
JDH Corrosion Consultants, Inc.
Principal

CC: File19265

COOPER TESTING LABORATORY

Corrosivity Tests Summary

CTL # 640-1358 **Date:** 10/22/2019 **Tested By:** PJ **Checked:** PJ
Client: Cornerstone Earth Group **Project:** Appain 80 Shopping **Proj. No:** 856-1-6
Remarks:

Sample Location or ID			Resistivity @ 15.5 °C (Ohm-cm)			Chloride	Sulfate		pH	ORP		Sulfide	Moisture	Soil Visual Description
			As Rec.	Min	Sat.	mg/kg	mg/kg	%		(Redox)		Qualitative	At Test	
						Dry Wt.	Dry Wt.	Dry Wt.		E_H (mv)	At Test	by Lead	%	
Boring	Sample, No.	Depth, ft.	ASTM G57	Cal 643	ASTM G57	ASTM D4327	ASTM D4327	ASTM D4327	ASTM G51	ASTM G200	Temp °C	Acetate Paper	ASTM D2216	
EB-1	1A	1.0	-	-	1,337	2	16	0.0016	7.6	-	-	-	25.9	Olive Sandy CLAY
EB-3	2A	3.0	-	-	1,044	4	18	0.0018	8.1	-	-	-	36.3	Very Dark Greenish Gray Clayey SAND w/ Gravel
EB-6	3A	5.0	-	-	1,699	4	12	0.0012	7.7	-	-	-	29.2	Very Dark Olive Brown Sandy CLAY w/ Weathered Rock
EB-11	3A	5.0	-	-	1,316	10	66	0.0066	7.7	-	-	-	13.0	Olive Brown Silty GRAVEL w/ Sand

APPENDIX D: PREVIOUS SUBSURFACE DATA FROM CORNERSTONE ENVIRONMENTAL STUDIES

BORING NUMBER GW-3 (NEW)

CORNERSTONE EARTH GROUP

PROJECT NAME Pinole Square Additional Drycleaner Investigation

PROJECT NUMBER 856-1-5

PROJECT LOCATION 1211 to 1501 Tara Hills Drive, Pinole, CA

DATE STARTED 7/25/19 **DATE COMPLETED** 7/25/19

GROUND ELEVATION **BORING DEPTH** 17.5 ft.

DRILLING CONTRACTOR Penecore

LATITUDE **LONGITUDE**

DRILLING METHOD Direct Push

GROUND WATER LEVELS:

LOGGED BY NKM

▽ **AT TIME OF DRILLING** 15 ft.

NOTES

▼ **AT END OF DRILLING** Not Encountered

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ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	Sample Type and Interval	Sample Submitted for Laboratory Analysis	Percent Recovery (%)	OVM Reading (ppm)	Odors or Discoloration	Notes
	0		3 inches asphalt concrete							
			Sandy Lean Clay with Gravel (CL) fine sand, fine subrounded gravel							
			Fat Clay (CH) moist, dark brown				100			
	5						70			
			Lean Clay (CL) moist, brown							
	10						77			
			Poorly Graded Sand (SP) moist, brown, fine sand							
	15 ▽		becomes wet at 15'							
			Bottom of Boring at 17.5 feet.							
	20									

BORING NUMBER GW-4

CORNERSTONE EARTH GROUP

PROJECT NAME Pinole Square Additional Drycleaner Investigation
PROJECT NUMBER 856-1-5
PROJECT LOCATION 1211 to 1501 Tara Hills Drive, Pinole, CA

DATE STARTED 7/25/19 **DATE COMPLETED** 7/25/19
GROUND ELEVATION **BORING DEPTH** 22.5 ft.
DRILLING CONTRACTOR Penecore
LATITUDE **LONGITUDE**
DRILLING METHOD Direct Push
GROUND WATER LEVELS:
LOGGED BY NKM
AT TIME OF DRILLING 20.5 ft.
NOTES
AT END OF DRILLING Not Encountered

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ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	Sample Type and Interval	Sample Submitted for Laboratory Analysis	Percent Recovery (%)	OVM Reading (ppm)	Odors or Discoloration	Notes
	0		3 inches asphalt concrete							
			Fat Clay (CH) moist, dark brown							
			Lean Clay with Sand (CL) moist, brown, fine sand				93	0		
	5		**Poorly Graded Sand (SP)** brown, fine sand							
			Lean Clay with Sand (CL) moist, orange and brown mottling, fine sand				97	0		
	10		**Fat Clay (CH)** wet				100	0		
	15		**Lean Clay with Sand (CL)** moist, gray				100	0		
	20		**Clayey Sand (SC)** wet, gray							
			Bottom of Boring at 22.5 feet.							

APPENDIX E: PREVIOUS SUBSURFACE DATA BY OTHERS

CLASSIFICATION AND MATERIAL SYMBOLS

MAJOR DIVISIONS PER ASTM D2488-06			MAJOR GROUP NAMES AND MATERIAL SYMBOLS	
COARSE-GRAINED SOILS More than 50% retained on the No. 200 sieve	GRAVELS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	Clean gravels less than 5% fines	GW	Well-Graded GRAVEL
			GP	Poorly Graded GRAVEL
		Gravels with more than 12% fines	GM	SILTY GRAVEL
			GC	CLAYEY GRAVEL
	SANDS MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	Clean sand less than 5% fines	SW	Well-Graded SAND
			SP	Poorly Graded SAND
		Sands with more than 12% fines	SM	SILTY SAND
			SC	CLAYEY SAND
FINE-GRAINED SOILS 50% or more passes the No. 200 sieve	SILTS AND CLAYS Liquid Limit Less than 50%		ML	SILT
			CL	Lean CLAY
			OL	ORGANIC SILT
	SILTS AND CLAYS Liquid Limit Greater than 50%		MH	Elastic SILT
			CH	Fat CLAY
			OH	ORGANIC CLAY
HIGHLY ORGANIC SOILS			PT	Peat or Highly Organic Soils

Notes:
Classification of soils on the boring logs is in general accordance with ASTM D2488, or D2487 if appropriate laboratory data are available.
The geologic formation is noted in bold font at the top of interpreted interval on the boring logs.

OTHER MATERIAL SYMBOLS

- Debris or Mixed Fill
- Pavement with Aggregate Base

SAMPLER TYPE

SPT (Driven) 1-3/8" ID 2" OD	Modified California (Driven) 2-3/8" ID 3" OD	Modified California (Driven) 1-7/8" ID 2-1/2" OD
Shelby Tube (Pushed) 2-7/8" ID 3" OD	Pitcher Barrel (Rotary-cut) 2-7/8" ID	Osterberg (Piston) 2-7/8" ID
101 Geobarrel (Rotary-cut) 2-7/8" ID	Rock Core (Rotary-cut) See log for size	Vibracore (Vibrated) See log for size
Push-core (Pushed) See log for size	Collected from Auger	Other See log for details

Note: Refer to text of report for additional details or other sampler types.

BLOW COUNT

Number of blows required to drive sampler each of three 6-in. intervals, as measured in the field (uncorrected). An SPT hammer (140 lb., falling 30-in.) was used unless otherwise noted on the boring log. For example:

Blow Count	Description
5 7 8	5, 7, and 8 blows for first, second, and third interval, respectively.
35 50/3"	35 blows for the first interval. 50 blows for the first 3 inches of the second interval. Lack of third value implies that driving was stopped 3 inches into the second interval.
WOH WOH 5	"WOH" indicates that the weight of the hammer was sufficient to advance the sampler over the first two intervals. 5 blows were required to advance the sampler over the third interval.

N-VALUE

The N-Value represents the blowcount for the last 12 inches of the sample drive if three 6-inch intervals were driven. N-value presented is independant of impact energy. If 50 hammer blows were insufficient to drive through either the second or the third interval, the total number of blows and total length driven are reported (excluding the first interval). "ref" (refusal) indicates that 50 blows were insufficient to drive through the first 6-inch interval.

Parenthesis indicate that an approximate correction has been applied for non-SPT drive samplers. For example, a factor of 0.63 is commonly used to adjust blow counts obtained using a 3-inch outside diameter modified California sampler to correspond to Standard Peneteration Test.

UNDRAINED SHEAR STRENGTH

A value of undrained shear strength is reported. The value is followed by a letter code indicating the type of test that was performed, as follows:

U - Unconfined Compression
Q - Unconsolidated Undrained Triaxial
T - Torvane
P - Pocket Penetrometer
M - Miniature Vane
F - Field Vane
R - R-value

OTHER TESTS

Field or laboratory tests without a dedicated column on the boring log are reported in the Other Tests column. A letter code is used to indicate the type of test. For certain tests, a value representing the test result is also provided. Typical letter codes are as follows. Additional codes may be used. Refer to the report text and the laboratory testing results for additional information.

k - Permeability (cm/s)
Consol - Consolidation
Gs - Specific Gravity
MA - Particle Size Analysis
EI - Expansion Index
OVM - Organic Vapor Meter

WATER LEVEL SYMBOLS

- Initial water level
- Final water level
- Seepage encountered

INCREASING MOISTURE CONTENT

Dry
Moist
Wet

CONSISTENCY OF COHESIVE SOIL

CONSISTENCY	UNDRAINED SHEAR STRENGTH (KIPS PER SQUARE FOOT)
Very Soft	< 0.25
Soft	0.25 to 0.50
Medium Stiff	0.50 to 1.0
Stiff	1.0 to 2.0
Very Stiff	2.0 to 4.0
Hard	> 4.0

Note: In absence of test data, consistency has been estimated based on manual observation.

APPARENT DENSITY OF COHESIONLESS SOIL

APPARENT DENSITY	N-VALUE
Very Loose	0 to 4
Loose	5 to 9
Medium Dense	10 to 29
Dense	30 to 49
Very Dense	> 49

TERMS AND SYMBOLS USED ON BORING LOGS

PLATE B-1

Antique Restoration
Project No. 04.72130077

LOCATION:

1271 Tara Hills Drive

DEPTH, ft	RECOVERY	MATERIAL DESCRIPTION	OTHER TESTS
	6/6"	3" Asphalt Pavement, 3" Concrete	PID = 0.5
	6/6"	**ARTIFICIAL FILL (af)** CLAYEY SILT (MH): yellowish brown, moist, occasional medium subrounded gravel, no odor or staining	PID = 4.4
5	6/6"	- color change to bluish gray, slight hydrocarbon (gasoline) odor	PID = 14
	6/6"	Lean CLAY with GRAVEL (CL): brown, moist, with gray mottling, subangular gravel, low plasticity, no odor or staining	PID = 1.0
10	6/6" 6/6"	SILTY CLAY with GRAVEL (CL-ML): gray, moist, low plasticity, medium to coarse angular gravel, no staining, slight hydrocarbon (gasoline) odor	PID = 0.8 PID = 1.6
	6/6" 6/6"	Lean CLAY with GRAVEL (CL): dark brown, moist, low plasticity, fine to coarse gravel, pockets of gray clay observed. Iron oxide staining, slight hydrocarbon (gasoline) odor	PID = 5.1
15	6/6" 6/6"	SILTY SAND (SM): bluish-gray, moist, fine grained, no staining, moderate hydrocarbon (gasoline) odor	PID = 10.9 PID = 42.6 PID = 66
20	6/6" 6/6"	Lean CLAY with GRAVEL (CL): black, moist, low plasticity, medium to coarse angular gravel, no staining, moderate hydrocarbon (gasoline) odor	PID = 7.6
	6/6"	- organics present (wood)	PID = 2.8
	6/6"	SILTY CLAY (CL-ML): bluish-gray, moist, low plasticity, no staining, slight hydrocarbon (gasoline) odor	PID = 2.0
25	6/6" 60 0/600" 6/6" 6/6"	**NATIVE** CLAYEY SILT (MH): yellowish brown, moist, no odor or staining - some fine grained sand - bluish gray clay inclusions	PID = 1.6 PID = 1.5 PID = 1.8
30	6/6"	SANDY Lean CLAY (CL): bluish-gray, moist, low plasticity, medium to coarse grained sand, no odor, iron oxide staining - moisture increasing to very moist	PID = 1.3
	6/6"	CLAYEY SAND (SC): brown, moist to wet, medium to coarse grained sand, no odor or staining	PID = 1.6
35	6/6" 6/6"	CLAYEY SILT (MH): brown, moist, low plasticity, no odor, iron oxide staining - Bluish-gray staining	PID = 237 PID = 8.5
40	6/6"	Lean CLAY (CL): bluish-gray, moist, low plasticity, no staining, moderate hydrocarbon (gasoline) odor	PID = 3.3
45	6/6"	CLAYEY SILT (MH): brown, moist, low plasticity, no odor, iron oxide staining - bluish gray clay inclusions water encountered at 39.85 ft bgs, measured at 14:49	PID = 0.7
50	6/6"	Lean CLAY (CL): grayish brown, dry, moderate plasticity, no odor or staining - Iron oxide staining - moisture increasing - color change to bluish gray	PID = 0.6
		- Boring Terminated at 50 feet bgs NOTES: 1. Terms and symbols defined on Plate B-1.	

BORING DEPTH: 50.0 ft
BACKFILL: Grout
DEPTH TO WATER: 39.8 ft 39.8
FIELDWORK DATE: October 10, 2013
DRILLING METHOD: 2-in. dia. Direct Push

HAMMER TYPE: Automatic Trip
RIG TYPE: Geoprobe 7822DT
DRILLED BY: Vaportech
LOGGED BY: M. D'Anna
CHECKED BY: K. Emery

LOG OF BORING NO. B-1
Antique Restoration
Pinole, California

DEPTH, ft	MATERIAL SYMBOL	SAMPLER TYPE	BLOW COUNT OR PRESSURE, psi	N VALUE OR RQD%	RECOVERY	MATERIAL DESCRIPTION	DRY UNIT WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX	UNDRAINED SHEAR STRENGTH, S_u, ksf	OTHER TESTS

LOCATION:

1271 Tara Hills Drive

MATERIAL DESCRIPTION

3" Asphalt Pavement, 3" Concrete

ARTIFICIAL FILL (af)

CLAYEY SAND (SC): bluish gray, moist, fine grained sand, iron oxide staining, moderate hydrocarbon (gasoline) odor

Lean CLAY with GRAVEL (CL): bluish gray, moist, low plasticity, medium subangular gravel, some black staining, moderate hydrocarbon (gasoline) odor

CLAYEY SAND with GRAVEL (SC): bluish gray, moist, fine grained sand, medium subangular gravel, no staining, moderate hydrocarbon (gasoline) odor

GRAVELLY Lean CLAY (CL): bluish gray, moist, low plasticity, fine to medium subangular gravel, no staining, moderate hydrocarbon (gasoline) odor
- Iron oxide staining
- color change to grayish brown with black staining

Lean CLAY (CL): dark brown, moist, moderate plasticity, occasional subrounded coarse gravel, slight hydrocarbon (gasoline) odor

CLAYEY SAND (SC): bluish gray, moist, fine grained sand, no staining, moderate hydrocarbon (gasoline) odor

GRAVELLY Lean CLAY (CL): black, moist, low plasticity, medium subangular gravel, no staining, moderate hydrocarbon (gasoline) odor
- bluish gray fine grained sand (SP) inclusion

Lean CLAY (CL): black, moist, moderate plasticity, organics (rootlets) present, no odor or staining
- slight hydrocarbon (gasoline) odor
- color change to bluish gray
- low plasticity

NATIVE

SILTY SAND (SM): bluish gray, moist, fine grained sand, no odor or staining

CLAYEY SILT (MH): brown, moist, no odor or staining

Lean CLAY (CL): grayish brown, moist, low plasticity, no odor or staining. Pockets of bluish gray lean CLAY (CL) with moderate hydrocarbon (gasoline) odor present
- iron oxide staining
- 2" bluish gray fine grained SAND (SP) lense
- moderate hydrocarbon (gasoline) odor

SANDY Lean CLAY (CL): bluish gray, moist, low plasticity, medium grained sand, no staining, moderate hydrocarbon (gasoline) odor

Lean CLAY (CL): stiff, brown, dry, low plasticity, no odor or staining bluish gray lean CLAY (CL) inclusion, moderate hydrocarbon (gasoline) odor
- iron oxide staining
- bluish gray mottling

- Boring Terminated at 40 feet bgs

NOTES:
1. Terms and symbols defined on Plate B-1.

Depth marks: 5, 10, 15, 20, 25, 30, 35, 40

Recovery: 6/6" (repeated for each sample interval); 48.0/480"

OTHER TESTS:
PID = 63.7
PID = 364
PID = 11.7
PID = 12.9
PID = 133
PID = 14.4
PID = 129
PID = 629
PID = 49.3
PID = 13
PID = 3.6
PID = 2.1
PID = 2.4
PID = 1.2
PID = 482
PID = 9.5
PID = 101
PID = 11.2
PID = 1.9

BORING DEPTH: 40.0 ft
BACKFILL: Grout
DEPTH TO WATER: Not Encountered
FIELDWORK DATE: October 10, 2013
DRILLING METHOD: 2-in. dia. Direct Push

HAMMER TYPE: Automatic Trip
RIG TYPE: Geoprobe 7822DT
DRILLED BY: Vaportech
LOGGED BY: M. D'Anna
CHECKED BY: K. Emery

LOG OF BORING NO. B-2
Antique Restoration
Pinole, California

LOCATION:

1271 Tara Hills Drive

DEPTH, ft	MATERIAL SYMBOL	SAMPLER TYPE	BLOW COUNT OR PRESSURE, psi	N VALUE OR RQD%	RECOVERY	MATERIAL DESCRIPTION	DRY UNIT WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX	UNDRAINED SHEAR STRENGTH, S_u, ksf	OTHER TESTS
					6/6"	3" Asphalt Pavement, 3" Concrete							PID = 0.1
					6/6"	**ARTIFICIAL FILL (af)** CLAYEY SILT (MH): brown, moist, occassional subrounded gravel							PID = 0.1
5 10					6/6" 6/6" 6/6" 6/6" 6/6"	Lean CLAY (CL): blue, moist, low plasticity, no staining, moderate hydrocarbon (motor oil) odor - with medium angular gravel - moderate hydrocarbon (gasoline) odor, black staining - Thin lense of poorly-graded SAND with CLAY and GRAVEL (SP-SC), moderate hydrocarbon (gasoline) odor							PID = 36.5 PID = 1.6 PID = 1.6 PID = 2.5 PID = 9.3 PID = 2.4
15					6/6" 6/6"	Lean CLAY with GRAVEL (CL): black, moist, low plasticity, fine to medium subangular to subrounded gravel, no staining, slight hydrocarbon (gasoline) odor							PID = 122 PID = 1.2
					6/6"	Lean CLAY (CL): blue, moist, low plasticity, no staining, moderate hydrocarbon (gasoline) odor							PID = 4.6
20					6/6" 6/6" 6/6" 6/6"	Lean CLAY with GRAVEL (CL): black, moist, low plasticity, fine to medium subangular to subrounded gravel, no staining, slight hydrocarbon (gasoline) odor - moisture increasing to very moist							PID = 6.3 PID = 1.3 PID = 0.7
25					6/6" 6/6"	**NATIVE** Lean CLAY (CL): grayish black, moist, low plasticity, no odor or staining							PID = 0.5 PID = 0.5
30					60 0/600" 6/6" 6/6" 6/6"	SILT (ML): grayish brown, moist, no odor or staining							PID = 0.5 PID = 0.6 PID = 0.5
35					6/6" 6/6"	SANDY SILT (ML): brown, moist, fine to medium grained sand, irox oxide staining, no odor							PID = 0.5 PID = 1.8
40					6/6" 6/6" 6/6"	SILT (ML): brown, moist, iron oxide staining, no odor - moderate hydrocarbon (gasoline) odor							PID = 320 PID = 196 PID = 246
45 50					6/6" 6/6" 6/6"	CLAYEY SILT (MH): brown, moist, no staining, moderate hydrocarbon (gasoline) odor water encountered at 42.8 ft bgs, measured at 14:15							PID = 141 PID = 2.4 PID = 1.8
						- Boring Terminated at 50 feet bgs NOTES: 1. Terms and symbols defined on Plate B-1.							

BORING DEPTH: 50.0 ft
BACKFILL: Grout
DEPTH TO WATER: 43.2 ft 43.2
FIELDWORK DATE: October 10, 2013
DRILLING METHOD: 2-in. dia. Direct Push

HAMMER TYPE: Automatic Trip
RIG TYPE: Geoprobe 7822DT
DRILLED BY: Vaportech
LOGGED BY: M. D'Anna
CHECKED BY: K. Emery

LOG OF BORING NO. B-3
Antique Restoration
Pinole, California

DEPTH, ft	MATERIAL SYMBOL	SAMPLER TYPE	BLOW COUNT OR PRESSURE, psi	N VALUE OR RQD%	RECOVERY	LOCATION: 1271 Tara Hills Drive — MATERIAL DESCRIPTION	DRY UNIT WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX	UNDRAINED SHEAR STRENGTH, S_u, ksf	OTHER TESTS
						6 inches Asphalt Pavement							PID = 2.4
						SILTY SAND with GRAVEL (SM): brown, moist, fine grained sand, fine angular gravel, no odor, iron oxide staining							
5						SANDY Lean CLAY (CL): brown, moist, low plasticity, fine grained sand, no odor or staining, lite brown mottling							PID = 2.1
						Lean CLAY (CL): brown, moist, moderate plasticity, lite brown mottling, no odor or staining							
10						Lean CLAY (CL): light brown, moist, low plasticity, no odor or staining							PID = 1.9
						CLAYEY SAND (SC): light brown, moist, fine grained sand, no odor or staining - no fines, color change to brown							
15						- iron oxide staining - fines							PID = 1.3
20						- no fines, iron oxide staining							PID = 1.2
					54 0 540"	Poorly-graded SAND with CLAY (SP-SC): brown, moist, fine to medium grained sand, no odor or staining							
25						Lean CLAY (CL): brown, moist, moderate plasticity, no odor, iron oxide staining, black veins, caliche							PID = 1.2
30						- with fine grained sand, Static Water at 29.84'							PID = 2.1
						CLAYEY SAND (SC): brown, moist, fine grained sand, iron oxide staining, no odor							
35													PID = 2.4
						Lean CLAY (CL): brown, moist, low plasticity, no odor or staining - iron oxide staining							
40						Lean CLAY (CL): blue gray, dry, low plasticity, no odor or staining							PID = 2.9
45													PID = 1.7
						- Boring Terminated at 45 feet bgs NOTES: 1. Terms and symbols defined on Plate B-1.							

BORING DEPTH: 45.0 ft
BACKFILL: Grout
DEPTH TO WATER: 29.8 ft
FIELDWORK DATE: November 21, 2013
DRILLING METHOD: 2-in. dia. Direct Push

HAMMER TYPE: Automatic Trip
RIG TYPE: Geoprobe 7822DT
DRILLED BY: Vaportech
LOGGED BY: M. D'Anna
CHECKED BY: K. Emery

LOG OF BORING NO. B-4
Antique Restoration
Pinole, California

Antique Restoration
Project No. 04.72130077

Sheet 1 of 1

LOCATION:

1271 Tara Hills Drive

DEPTH, ft	MATERIAL SYMBOL	SAMPLER TYPE	BLOW COUNT OR PRESSURE, psi	N VALUE OR RQD%	RECOVERY	MATERIAL DESCRIPTION	DRY UNIT WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX	UNDRAINED SHEAR STRENGTH, S_u, ksf	OTHER TESTS
						6 inches Asphalt Pavement							PID = 1.3
						SILTY SAND (SM): tan, moist, fine grained sand, no odor or staining							
5						Lean CLAY (CL): brown, moist, low plasticity, some silt, no odor, iron oxide staining							PID = 1.2
						Lean CLAY (CL): black, moist, low plasticity, no odor or staining - organic odor - iron oxide staining							PID = 0.9
10						Poorly-graded SAND (SP): brown, moist, fine grained sand, no odor, iron oxide staining							PID = 1.9
						SANDY Lean CLAY (CL): brown, moist, low plasticity, no odor, iron oxide staining							
15						CLAYEY SAND (SC): brown, moist, fine grained sand, no odor, iron oxide staining							PID = 1.1
20					54 0 540"	SANDY Lean CLAY (CL): brown, moist, low plasticity, fine grained sand, no odor or staining - color change to reddish brown							PID = 2.1
25						Poorly-graded SAND (SP): brown, moist, fine grained sand, no odor or staining - fine to coarse sand - color change to red							PID = 1.2
30						Lean CLAY (CL): brown, moist, low plasticity, some fine grained sand, no odor, iron oxide staining							PID = 2.3
35						Lean CLAY (CL): bluish gray, moist, low plasticity, no odor or staining							PID = 2.3
40													PID = 1.6
45						- Boring Terminated at 45 feet bgs NOTES: 1. Terms and symbols defined on Plate B-1.							PID = 1.6

BORING DEPTH: 45.0 ft
BACKFILL: Grout
DEPTH TO WATER: Not Encountered
FIELDWORK DATE: November 21, 2013
DRILLING METHOD: 2-in. dia. Direct Push

HAMMER TYPE: Automatic Trip
RIG TYPE: Geoprobe 7822DT
DRILLED BY: Vaportech
LOGGED BY: M. D'Anna
CHECKED BY: K. Emery

LOG OF BORING NO. B-5
Antique Restoration
Pinole, California

LOCATION:

1271 Tara Hills Drive

DEPTH, ft	MATERIAL SYMBOL	SAMPLER TYPE	BLOW COUNT OR PRESSURE, psi	N VALUE OR RQD%	RECOVERY	MATERIAL DESCRIPTION	DRY UNIT WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX	UNDRAINED SHEAR STRENGTH, S_u, ksf	OTHER TESTS
						6 inches Asphalt Pavement							PID = 1.8
						Lean CLAY (CL): light brown, moist, low plasticity, no odor or staining							
						- medium to coarse angular gravel							
5													PID = 1.5
													PID = 1.9
						- bluish gray mottling							
						- black staining							
						CLAYEY SAND (SC): brown, moist, fine grained sand, no odor, iron oxide staining							
10													PID = 1.4
						Lean CLAY with GRAVEL (CL): dark brown, moist, low plasticity, medium to coarse angular gravel, no odor, iron oxide staining							PID = 1.8
						Lean CLAY (CL): blue gray, moist, moderate plasticity, black staining, no odor							
15													PID = 1.4
						Poorly-graded SAND (SP): blue gray, moist, fine grained sand, no odor or staining							
						Lean CLAY with GRAVEL (CL): black, moist, low plasticity, medium angular gravel, organic odor, no staining							
20													PID = 2.1
						Lean CLAY (CL): black, moist, low plasticity, blue gray mottling, organic odor, no staining							
						CLAYEY SAND (SC): blue gray, moist, fine grained sand, no odor, iron oxide staining							
25						- color change to brown							PID = 1.3
					66 0 660"								
						Poorly-graded SAND (SP): reddish brown, moist, fine to medium grained sand, no odor or staining							
30													PID = 0.9
						- iron oxide staining							
						CLAYEY SAND (SC): brown, moist to wet, fine grained sand, no odor or staining							
						Lean CLAY (CL): olive, moist, low plasticity, no odor, iron oxide staining							
35													PID = 1.7
						SANDY Lean CLAY (CL): olive, moist, low plasticity, fine grained sand, no odor, iron oxide staining							
40													PID = 1.5
						Lean CLAY (CL): olive, moist, low plasticity, no odor or staining							
45													PID = 1.1
						- iron oxide staining							
50													PID = 0.5
						- color change to blue gray							
													PID = 0.9
55						- Boring Terminated at 55 feet bgs NOTES: 1. Terms and symbols defined on Plate B-1.							

BORING DEPTH: 55.0 ft
BACKFILL: Grout
DEPTH TO WATER: Not Encountered
FIELDWORK DATE: November 21, 2013
DRILLING METHOD: 2-in. dia. Direct Push

HAMMER TYPE: Automatic Trip
RIG TYPE: Geoprobe 7822DT
DRILLED BY: Vaportech
LOGGED BY: M. D'Anna
CHECKED BY: K. Emery

LOG OF BORING NO. B-6
Antique Restoration
Pinole, California

TABLE 2-2
SUMMARY OF GROUNDWATER ELEVATIONS
1577 Tara Hills Drive
Pinole, California

Well ID	Screen Interval (ft bgs)	Top of Casing Elevation (ft MSL)	Date	Depth to Water (ft bTOC)	Groundwater Elevation (ft MSL)	Ground-water Flow Direction (degrees)	Hydraulic Gradient (ft/ft)
MW-1	7 to 12	200.251	4/9/15	5.46	194.79	226	0.162
			2/12/16	4.55	195.70	227	0.173
			9/22/16	6.77	193.48	228	0.136
			11/9/16	6.40	193.85	223	0.148
MW-1A	30 to 35	200.373	4/9/15	5.30	195.07	226	0.162
			2/12/16	4.31	196.06	227	0.173
			9/22/16	6.55	193.82	228	0.136
			11/9/16	6.11	194.26	223	0.148
MW-2	19 to 29	207.362	4/9/15	12.67	194.69	226	0.162
			2/12/16	11.82	195.54	227	0.173
			9/22/16	13.95	193.41	228	0.136
			11/9/16	13.40	193.96	223	0.148
MW-3	15 to 30	197.58	4/9/15	17.03	180.55	226	0.162
			2/12/16	17.41	180.17	227	0.173
			9/22/16	16.68	180.90	228	0.136
			11/9/16	17.13	180.45	223	0.148
MW-10	? to 32.2	198.813	4/9/15	17.15	181.66	226	0.162
			2/12/16	16.98	181.83	227	0.173
			9/22/16	15.99	182.82	228	0.136
			11/9/16	16.58	182.23	223	0.148

Notes:

ft bgs: feet below ground surface
ft MSL: feet above Mean Sea Level
ft bTOC: feet below top-of-casing
ft/ft: feet per foot

Monitoring wells surveyed by Luk and Associates on May 19, 2015
Groundwater flow direction based on monitoring wells MW-1A, MW-2, MW-3 and MW-10

APPENDIX D

PHASE I ENVIRONMENTAL SITE ASSESSMENT

CORNERSTONE EARTH GROUP

Type of Services	**Phase I Environmental Site Assessment Update and Preliminary Soil Vapor Quality Evaluation**
Location	**Appian 80 Shopping Center 1201 to 1577 Tara Hills Drive Pinole, California**
Client	**Hillsboro Properties**
Client Address	**1300 South El Camino Real, Suite 525 San Mateo, California 94402**
Project Number	**856-1-4**
Date	**June 27, 2019**

DRAFT

Prepared by

Sarah E. Kalika, P.G.
Senior Project Geologist

Christopher J. Heiny, P.G.
Principal Geologist

CORNERSTONE EARTH GROUP

Table of Contents

DRAFT

Type of Services	**Phase I Environmental Site Assessment Update and Preliminary Soil Vapor Quality Evaluation**
Location	**Appian 80 Shopping Center 1201 to 1577 Tara Hills Drive Pinole, California**

SECTION 1: INTRODUCTION

This report presents the results of the Phase I Environmental Site Assessment (ESA) Update and Preliminary Soil Vapor Quality Evaluation performed at the Appian 80 Shopping Center located at 1201 to 1577 Tara Hills Drive in Pinole, California (Site) as shown on Figures 1 and 2 and described in Table 1. This work was performed for Hillsboro Properties in accordance with our April 24, 2019 Agreement (Agreement).

This report updates our Phase I ESA dated November 24, 2015. In addition, this report includes a preliminary soil vapor quality evaluation performed near the former on-Site drycleaner and off-Site dry cleaner as discussed below.

1.1 PURPOSE

The scope of work presented in the Agreement was prepared in general accordance with ASTM E 1527-13 titled, "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process" (ASTM Standard). The ASTM Standard is in general compliance with the Environmental Protection Agency (EPA) rule titled, "Standards and Practices for All Appropriate Inquiries; Final Rule" (AAI Rule). The purpose of this Phase I ESA is to strive to identify, to the extent feasible pursuant to the scope of work presented in the Agreement, Recognized Environmental Conditions at the property.

As defined by ASTM E 1527-13, the term Recognized Environmental Condition means the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to any release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. De minimis conditions are not Recognized Environmental Conditions.

Cornerstone Earth Group, Inc. (Cornerstone) understands that Hillsboro Properties currently owns portions of the Site and intends to purchase the remaining portions of the Site for a commercial redevelopment. The redevelopment tentatively will consist of demolishing the current structures and the construction of new retail space. We performed this Phase I ESA to support Hillsboro Properties in evaluation of Recognized Environmental Conditions at the Site. This Phase I ESA is intended to reduce, but not eliminate, uncertainty regarding the potential for Recognized Environmental Conditions at the Site.

1.2 SCOPE OF WORK

As presented in our Agreement, the scope of work performed for this Phase I ESA included the following:

- A reconnaissance of the Site to note readily observable indications of significant hazardous materials releases to structures, soil or ground water.

- Drive-by observation of adjoining properties to note readily apparent hazardous materials activities that have or could significantly impact the Site.

- Acquisition and review of a regulatory agency database report of public records for the general area of the Site to evaluate potential impacts to the Site from reported contamination incidents at nearby facilities.

- Review of readily available information on file at selected governmental agencies to help evaluate past and current Site use and hazardous materials management practices.

- Review of readily available maps and aerial photographs to help evaluate past and current Site uses.

- Interviews with persons reportedly knowledgeable of existing and prior Site uses, including the current and past Site owners, and the current and past Site operator(s).

- Collection of soil vapor samples near the former on-Site drycleaner and off-Site drycleaner.

- Preparation of a written report summarizing our findings and recommendations.

The limitations for the Phase I ESA are presented in Section 10; the terms and conditions of our Agreement are presented in Appendix A.

1.3 ASSUMPTIONS

In preparing this Phase I ESA, Cornerstone assumed that all information received from interviewed parties is true and accurate. In addition, we assumed that all records obtained by other parties, such as regulatory agency databases, maps, related documents and environmental reports prepared by others are accurate and complete. We also assumed that the boundaries of the Site, based on information provided by Hillsboro Properties, are as shown on Figure 2. We have not independently verified the accuracy or completeness of any data received.

1.4 ENVIRONMENTAL PROFESSIONAL

This Phase I ESA was performed by Ms. Sarah E. Kalika, P.G., and Mr. Christopher J. Heiny, P.G., Environmental Professionals who meet the qualification requirements described in ASTM E 1527-13 and 40 CFR 312 § 312.10 based on professional licensing, education, training and experience to assess a property of the nature, history and setting of the Site.

SECTION 2: SITE DESCRIPTION

This section describes the Site as of the date of this Phase I ESA. The location of the Site is shown on Figures 1 and 2. Tables 1 through 3 summarize general characteristics of the Site and adjoining properties. The Site is described in more detail in Section 7, based on our on-Site observations.

2.1 LOCATION AND OWNERSHIP

Table 1 describes the physical location, and ownership of the property, based on information provided by Hillsboro Properties. We understand that Hillsboro Properties owns companies that own most of the Site parcels and intends to redevelop a portion of the Site.

Table 1. Location and Ownership

APN No.	Building Address	Owner	Current Occupant	Year Built	Building Size (sq. ft)	Lot Size (sq. ft.)
402-282-006-0	1201 Tara Hills	Pinsquare 2, LLC*	Vacant Land	n/a	n/a	14,375
402-282-016	No Address	Thomas G. Paulson Trust	Vacant	n/a	n/a	741
402-282-007-2	1211 Tara Hills	Appian 80 LP*	Pizza Hut	1973	1,080	2,091
402-282-008	1213 Tara Hills	Nga Tran	Pinole Key & Gift Shop	1973	900	1,394
	1215 Tara Hills	Nga Tran	Vaikiki Nails			
402-282-009-8	1221 Tara Hills	Appian 80 LLC*	Bank of America	1967	7,020	10,019
402-282-010-6	1251 Tara Hills	Paul Goldstone Enterprises, Inc.*	Vacant (former CSK/O'Reillys / Wheel Works)	1977	8,015	17,859
402-282-013-0	1261 Tara Hills	Appian 80 LP*	Vacant (former Car Wash)	1966	12,464	43,603
402-282-014-8	1271 Tara Hills	Pinsquare 1, LLC*	Vacant (former Antique Restoration)	1972	1,728	7,667
402-282-005-6	1401 Tara Hills	Appian 80 LP*	Vacant (former CVS)	1966	25,963	80,063
402-282-018-9	1421 Tara Hills	Appian 80 LP*	Safeway	1965	25,733	89,995
402-282-017-1	1431 Tara Hills	Appian 80 LP*	Vacant (former Tropical Fish and Pet Store)	1966	12,464	43,603
	1441 Tara Hills	Appian 80 LP*	Vacant (former Four Mile Cleaners)			
	1481 Tara Hills	Appian 80 LP*	Bar None			
	1491 Tara Hills	Appian 80 LP*	Vacant			

*Indicates company owned by Hillsboro Properties.

2.2 CURRENT/PROPOSED USE OF THE PROPERTY

The current and proposed uses of the property are summarized in Table 2.

Table 2. Current and Proposed Uses

Current Use	Commercial / Retail
Proposed Use	Commercial / Retail

2.3 SITE SETTING AND ADJOINING SITE USE

Land use in the general Site vicinity appears to be primarily commercial and residential. Based on our Site vicinity reconnaissance, adjoining Site uses are summarized below in Table 3.

Table 3. Adjoining Site Uses

North	Tara Hills Drive, Restaurant (McDonald's), Medical Offices, Gas Station (Pinole Express)
South	Interstate 80 and Commercial
East	Medical Offices and Appian Way
West	Residential

SECTION 3: USER PROVIDED INFORMATION

The ASTM standard defines the User as the party seeking to use a Phase I ESA to evaluate the presence of Recognized Environmental Conditions associated with a property. For the purpose of this Phase I ESA, the User is Hillsboro Properties. The "All Appropriate Inquiries" Final Rule (40 CFR Part 312) requires specific tasks be performed by or on behalf of the party seeking to qualify for Landowner Liability Protection under CERCLA (*i.e*, the User).

Per the ASTM standard, if the User has information that is material to Recognized Environmental Conditions, such information should be provided to the Environmental Professional. This information includes: 1) specialized knowledge or experience of the User, 2) commonly known or reasonably ascertainable information within the local community, and 3) knowledge that the purchase price of the Site is lower than the fair market value due to contamination. A search of title records for environmental liens and activity and use limitations also is required.

3.1 CHAIN OF TITLE

A chain-of-title was not provided for our review.

3.2 ENVIRONMENTAL LIENS OR ACTIVITY AND USE LIMITATIONS

An environmental lien is a financial instrument that may be used to recover past environmental cleanup costs. Activity and use limitations (AULs) include other environmental encumbrances, such as institutional and engineering controls. Institutional controls (ICs) are legal or regulatory restrictions on a property's use, while engineering controls (ECs) are physical mechanisms that restrict property access or use.

The regulatory agency database report described in Section 4.1 did not identify the Site as being in 1) US EPA databases that list properties subject to land use restrictions (*i.e.*, engineering and institutional controls) or Federal Superfund Liens or 2) lists maintained by the California Department of Toxic Substances Control (DTSC) of properties that are subject to AULs or environmental liens where the DTSC is a lien holder.

A Preliminary Title Report by Fidelity National Title Company (dated March 25, 2015) was provided for our review (Appendix B). The title report contained several references to utility easements. No environmental liens or records of ownership (including leases) indicative of significant hazardous materials use associated with the Site were listed in the title report.

3.3 SPECIALIZED KNOWLEDGE AND/OR COMMONLY KNOWN OR REASONABLY ASCERTAINABLE INFORMATION

Based on information provided by or discussions with Hillsboro Properties, we understand that fueling stations were formerly located at 1201 Tara Hills Drive and 1271 Tara Hills Drive. These properties are discussed further in Section 4. Hillsboro Properties also indicated that a Texaco fueling station was formerly located adjacent and to the east of the Site. The fueling station is a closed leaking underground storage tank (UST) site and is further discussed in Section 4. Based on information provided to us and reported within our previous Phase I ESA for this Site in 2015, we understand that litigation has been ongoing between the former fueling station and the owners of parcel 402-282-002-3 (1565, 1569, 1573, and 1577 Tara Hills Drive). No update was provided regarding the litigation for this current ESA Update.

3.4 DOCUMENTS PROVIDED BY HILLSBORO PROPERTIES

In addition to the most recently available Preliminary Title Report, Hillsboro Properties provided property, parcel, tenant, and ownership information; record of survey dated October 15, 2015; and proposed development plans. Information from these documents is incorporated into the above sections. In addition, Hillsboro Properties provided documentation related to the leaking UST case closure for the former Texaco Station located on the adjacent property to the east at 1599 Tara Hills Drive. This information is included in Section 4.1.3

SECTION 4: RECORDS REVIEW

4.1 STANDARD ENVIRONMENTAL RECORD SOURCES

Cornerstone conducted a review of federal, state and local regulatory agency databases provided by Environmental Data Resources (EDR) to evaluate the likelihood of contamination incidents at and near the Site. The database sources and the search distances are in general accordance with the requirements of ASTM E 1527-13. A list of the database sources reviewed, a description of the sources, and a radius map showing the location of reported facilities relative to the project Site are attached in Appendix B.

The purpose of the records review was to obtain reasonably available information to help identify Recognized Environmental Conditions. Accuracy and completeness of record information varies among information sources, including government sources. Record information is often inaccurate or incomplete. The Environmental Professional is not obligated to identify mistakes or insufficiencies or review every possible record that might exist with the Site. The customary practice is to review information from standard sources that is reasonably available within reasonable time and cost constraints.

4.1.1 On-Site Database Listings

The Site was identified in the regulatory agency databases listed in Table 4.

Table 4. On-Site Database Listings

Facility Name and Address	Database Listings
Chevron 1201 Tara Hills Drive	▪ Facility and Manifest Data (HAZNET) ▪ Facility Indexing System / Facility Registry System (FINDS) ▪ EPA's Resource Conservation and Recovery Act Comprehensive database (RCRA / NLR)
Kenneth Regalia Inc 1201 Tara Hills Drive	▪ California State-wide Environmental Evaluation and Planning System (CA SWEEPS UST) ▪ Contra Costa County UST and Hazardous Waste Program Sites (SL CONTRA COSTA) ▪ Historical UST Listing ▪ State-wide Environmental Evaluation and Planning System (CA SWEEPS UST)
All Cars Incorporated 1251 Tara Hills Drive	▪ EDR Historical gas/service/repair Stations (EDR US Hist Auto Stat) ▪ HAZNET
Kragen Auto Parts / Wheel Works 1251 Tara Hills Drive	▪ HAZNET ▪ FINDS
O'Reilly Auto Parts 1251 Tara Hills Drive	▪ SL CONTRA COSTA
All Cars Incorporated / Grand Auto #71 1251 Tara Hills Drive	▪ HAZNET
Super Car Wash 1261 Tara Hills Drive	▪ HAZNET
Antique Restoration 1271 Tara Hills Drive	▪ Emission Inventory Data (EMI) ▪ SL CONTRA COSTA ▪ Leaking Underground Storage Tank Database (LUST) ▪ Historical Hazardous Waste and Substances Sites List (HIST CORTESE) ▪ FINDS
Rent A Rack 1271 Tara Hills Drive	▪ RGA LUST
CVS Pharmacy 1401 Tara Hills Drive	▪ SL CONTRA COSTA ▪ HAZNET ▪ FINDS ▪ Resource Conservation and Recovery Act Large Quantity Generator (RCRA-LQG)
Long's Drug Store 1401 Tara Hills Drive	▪ HAZNET
Safeway / Nexcycle 1421 Tara Hills Drive	▪ FINDS ▪ HAZNET ▪ SL CONTRA COSTA ▪ SWRCY

Facility Name and Address	Database Listings
Four Mile Cleaners 1441 Tara Hills Drive	▪ EDR Dry Cleaner List (EDR DRY CLEANERS) ▪ EMI ▪ RCRA Small Quantity Generator (RCRA-SQG) ▪ FINDS ▪ Drycleaners database listing (DRYCLEANERS) ▪ SL CONTRA COSTA ▪ HAZNET

The HAZNET, EMI, FINDS, RCRA-LQG, RCRA-SQG, RCRA / NLR, and SWRCY database listings are related to permitting through local, state, and/or federal agencies. No violations of concern were noted for these listings.

The historical auto station listing for 1251 Tara Hills Drive (former All Cars Incorporated / Grand Auto #71) is related to the automotive repair activities associated with this business. This unit was most recently occupied by Kragen Auto Parts and Wheel Works. This facility is further discussed in Section 4.2.

The database listings indicate that former gasoline filling stations were formerly located at 1201 Tara Hills Drive (Chevron) and 1271 Tara Hills Drive (Rent A Rack). The database listings for the former Chevron Station indicate that one 1,000-gallon waste oil UST and three 10,000-gallon gasoline USTs were formerly located at this facility. The database listings for the former Rent A Rack indicate that two 10,000-gallon gasoline USTs and one 500-gallon waste oil UST were present at this facility. These facilities are further discussed in Section 4.2.

The database listings indicate a dry cleaner was present at 1441 Tara Hills Drive (Four Mile Cleaners). Cornerstone performed a soil vapor quality evaluation near this property in conjunction with this Phase I Update. Results from this evaluation are discussed in Section 9.

4.1.2 Adjoining Property Database Listings and Nearby Spill Incidents

Table 5. Adjoining and Nearby Property Database Listings

Facility Name and Address	Database Listings
2298 Appian Way Former BP Station (current Pinole Express Station)	▪ HIST UST ▪ SWEEPS UST ▪ LUST ▪ HAZNET ▪ ENR ▪ HIST CORTESE ▪ CONTRA COSTA CO. SITE LIST ▪ EDR HIST AUTO ▪ UST ▪ CERS TANKS ▪ CERS HAZ WASTE

Facility Name and Address	Database Listings
1599 Tara Hills Drive Former Exxon and Texaco Stations	▪ LUST ▪ HIST CORTESE ▪ CONTRA COSTA CO. LIST SITE ▪ CPS-SLIC ▪ CERS ▪ SWEEPS ▪ FINDS ▪ ECHO ▪ ERNS ▪ RGA LUST
Appian 80 Cleaners 1577 Tara Hills Drive	▪ EDR DRY CLEANERS ▪ FINDS ▪ DRYCLEANERS ▪ Voluntary Cleanup Program (VCP) ▪ EMI ▪ SL CONTRA COSTA ▪ Department of Toxic Substances Control Board Database Listing (ENVIROSTOR) ▪ HAZNET

The database listings for the former BP Station (current Pinole Express Station) located at 2298 Appian Way and the former Texaco and Exxon Station located at 1599 Tara Hills Drive are related to UST releases. The Appian 80 Cleaners located at 1577 Tara Hills Drive is related to the dry-cleaning operations and a reported dry-cleaning solvent release. These facilities are further discussed in Section 4.1.3.

4.1.3 Further Review of Database Listings

Cornerstone performed a cursory review of readily available documents from the state's Geotracker (http://geotracker.waterboards.ca.gov) and Envirostor (https://www.envirostor.dtsc.ca.gov/public/) databases for the leaking UST cases at 2298 Appian Way and 1599 Tara Hills Drive, and the dry cleaning facility located at 1577 Tara Hills Drive. Geotracker is a database and geographic information system (GIS) that provides online access to environmental data. It tracks regulatory data about leaking underground storage tank (LUST), Department of Defense, Site Cleanup Program and Landfill sites. The Envirostor database is maintained by the Department of Toxic Substances Control (DTSC) and contains information on investigation, cleanup, permitting, and/or corrective actions that are planned, being conducted or have been completed under DTSC's oversight. The Envirostor database includes the following site types: Federal Superfund sites; State Response sites; Voluntary Cleanup sites; and School sites. Please refer to the original documents reviewed for each case from Geotracker and Envirostor for complete information.

<u>2298 Appian Way – Former BP Station (Current Pinole Express)</u>

According to the *Conceptual Site Model and Request for Low-Threat Closure* report by Arcadis and dated August 30, 2013, the former BP Station reportedly had three gasoline USTs that were removed in 1987. Laboratory analyses of the soil samples collected from the base of the UST excavation and a sample collected from ground water that percolated into the tank pit reportedly contained elevated concentrations of gasoline-range petroleum hydrocarbons (TPHg) and petroleum-related volatile organic compounds (VOCs). Subsequent ground water monitoring in seven monitoring wells established that the former USTs impacted ground water beneath the Site. In addition, up to approximately 6 feet of separate phase hydrocarbons (SPH) reportedly was measured in monitoring well MW-5, which is located immediately down-gradient of the former UST pit. SPH removal was conducted by manual methods (bailer) and by a floating SPH extraction pump that operated between 1993 and 2003. In 2011, Arcadis implemented the Water Board-approved Corrective Action Plan (CAP) that consisted of the operation of a mobile dual-phase extraction (DPE) unit for the extraction and treatment of soil vapor and ground water. The DPE operated from March 12 to 17, 2012. In August 2012, approximately 0.01 foot of SPH reportedly was measured in MW-5. Arcadis performed further remediation by conducting a 7-hour vacuum truck extraction (VTE) event to remove the additional SPH.

In 2015, Arcadis performed dual-phase extraction of light non-aqueous phase liquid (LNAPL) occurred in the vicinity of MW-5 and reported this event in the report titled *Dual-Phase Extraction Event Summary Report and Request for Site Closure* dated January 29, 2016. In November 2016, Arcadis issued an addendum to the summary report and requested case closure under the Water Board’s low-threat closure policy.

In 2018, remaining on-Site monitoring wells were destroyed and case closure was granted by the Water Board in a letter dated May 14, 2018.

Based on the documents reviewed, the reported extent of impacts appears limited to this facility and does not appear to have likely impact the Site.

<u>1599 Tara Hills Drive – Former Texaco/Exxon Station</u>

In 1986, four 6,000-gallon gasoline USTs and one 550-gallon waste oil UST were removed from this facility and replaced with two 10,000-gallon gasoline USTs, one 8,000-gallon gasoline USTs, and one 12,000-gallon diesel UST. This second set of USTs were removed in 1992.

In 1986, elevated concentrations of total petroleum hydrocarbons (TPH) reportedly were detected in soil samples collected beneath the waste oil UST. Thirteen monitoring wells were subsequently installed between 1987 and 1995 and were sampled on a semi-annual basis. Gasoline-range TPH (TPHg), diesel-range TPH (TPHd), and petroleum-related VOCs (benzene, toluene, ethylbenzene, and xylenes [BTEX]) were detected in ground water samples, but were reportedly limited to the ground water beneath this property. A soil vapor extraction system reportedly was installed in 1995 and operated to remove VOCs from soil. Three monitoring wells (MW-10, MW-16 and MW-17) were installed down-gradient from the facility (and on-Site) and reportedly monitored until 2009. No TPHd, TPHg, or BTEX were detected in these wells indicating the release appeared to be limited to the facility.

On May 14, 2012, the Water Board approved closure of this case citing that the “*leak has been stopped and sources have been removed; the site has been adequately characterized; the dissolved hydrocarbon plume is stable, decreasing, and is not migrating; no water wells, deeper drinking water aquifers, surface water, or other sensitive receptors are likely to be impacted; and the site presents no significant risk to human health or the environment”.* Based on the case closure status and ground water sampling data showing no petroleum-related detections in monitoring wells installed on-Site, this leaking UST case does not appear likely to significantly impact the Site.

On February 10, 2015, the attorney representing the Tara Hills Drive LP (owner of the adjacent properties 1565 to 1577 Tara Hills Drive) sent a *Notice pursuant to the Resource Conservation and Recovery Act; re: Former Texaco Station 21-1212, 1599 Tara Hills Drive* to Texaco Downstream Properties and its affiliate Chevron Environmental Management Company, notifying them of the intent to bring claim and litigation due to the leaks at this former gasoline station. This notice indicated that recent indoor air sampling had been performed that detected "*benzene at a concentration of 2.7 microgram per cubic meter (µg/m³), above its relevant indoor air residential Regional Screening Levels (RSL) of 0.084 µg/m³* [the document incorrectly refers to the indoor air Environmental Screening Level (ESL; the correct indoor air RSL is 0.36 µg/m³]*; ethylbenzene up to 1.6 µg/m³, above indoor air RSL of 1.10 µg/m³; and 1,2,4-TMB* [1,2,4-trimethylbenzene] *up to 47 µg/m³, above indoor RSL of 7.3 µg/m³"*. The letter contended that the VOCs were *"attributed to releases from the upgradient Gas Station, which is 50-feet east of the site".* The Water Board reviewed this notice and compared the detected concentrations of benzene and ethylbenzene to the then current commercial ESLs (no ESL has been established for 1,2,4-TMB). The Water Board concluded that the "*detected contaminant concentrations are below their applicable ESLs"* and *"I do not recommend that the former Texaco Station 21-1212 be reopened at this time"*. The Water Board's statement regarding the detected concentrations being lower than then current (2013) ESLs appears to be in error as the detected benzene concentration (2.7 µg/m³) exceeds the commercial/industrial ESL of 0.42 µg/m³. The current (2019) commercial/industrial ESLs for benzene and ethylbenzene have not changed.

No further recent information regarding this property was available for Cornerstone's review.

<u>1577 Tara Hills Drive – Appian 80 Cleaners</u>

Dry cleaning businesses have operated at this address since approximately 1981. Cornerstone reviewed documents provided by the Contra Costa County Hazardous Materials Program (County) that indicates PCE was previously used as the primary dry-cleaning solvent, followed by a synthetic aliphatic hydrocarbon (DF-2000) solvent. Releases associated with the prior use of PCE were discovered in 2008. Several investigations were conducted between 2008 and 2013 that detected PCE in soil up to 1.1 mg/kg, in soil vapor up to 5,800 µg/m³, indoor air up to 35 µg/m³, and ground water up to 12,000 micrograms per liter (µg/L).

In September 2014, West Environmental submitted an *Interim Remedial Measures Work Plan* to the DTSC that proposed remedial measures to address the PCE release. Between March and June 2015, West collected soil and ground water grab samples and installed two monitoring wells to further delineate the extent of impacts. PCE was detected at concentrations up to 1,660 mg/kg in soil samples collected and up to 94,800 µg/L in the ground water samples collected. West concluded that the data from these and previous samples indicate a release from the dry cleaners is the likely source of PCE in soil and ground water. The data distribution indicate the highest soil and ground water concentrations are present beneath the boiler room within the dry cleaner. PCE ground water detections reportedly extend to the northwest into the parking lot area west of the dry cleaner.

In accordance with the *Interim Remedial Measures Work Plan* and the revised excavation area presented in the *Interim Data Submittal*, the soil beneath the boiler room is to be excavated to a depth of approximately 20 feet or until ground water is encountered. Confirmation soil samples and organic vapor meter (OVM) measurements are to be used to guide the excavation extents. An enhanced *in situ* biodegradation product is to be placed in the excavation to further remediation. Vapor extraction piping will reportedly be installed to extract vapors from the source area.

In June 2018, West Environmental submitted a *Final Removal Action Work Plan* to DTSC to propose a remediation method to address the release of PCE in ground water. This work plan included an assessment of various alternative remediation options and recommended to install a soil vapor extraction system, install a bioremediation system to facilitate enhanced in-situ degradation of VOCs within ground water, and monitor ground water attenuation over time. This plan was approved by DTSC in July 2018. No additional documents were available for Cornerstone's review on the Envirostore website.

4.2 ADDITIONAL ENVIRONMENTAL RECORD SOURCES

The following additional sources of readily ascertainable public information for the Site also were reviewed during this Phase I ESA.

4.2.1 City and County Agency File Review

Cornerstone requested available files pertaining to 1201 to 1577 Tara Hills Drive at the following public agencies: the City of Pinole Building Department (BD), City of Pinole Fire Department (FD), the Water Board, the DTSC, and the Contra Costa County Hazardous Materials Program (County). Representatives from the DTSC and FD indicated no files were available for the addresses requested. The BD did not respond to our request for a file review as of the date of this report. The information reviewed is summarized in Table 6.

Table 6. File Review Information

Agency Name	Date	Occupant	Remarks
1201 Tara Hills Drive			
County	1981	Chevron	Application to operate three 10,000-gallon gasoline USTs and one 1,000-gallon waste oil UST. The applications indicate the tanks were of single-walled fiberglass construction. Tanks were monitored for leaks using daily inventory reconciliation.
County	5/15/1997	Chevron	UST Removal Permit and Information Form: Documents indicate USTs were removed in 1997; County staff reports indicate the tanks were in good condition upon removal.
County	7/7/1997	Chevron	*UST Closure Report*, Touchstone Developments. Report documenting the removal of the USTs. This report is discussed further below.
1251 Tara Hills Drive			
County	8/5/1997	Super Auto	*Hydraulic Lift Removal Report*, Walker's Hydraulics, Inc.; Report documents removal of 5 hydraulic lifts and associated oil tanks. TPH-oil impacted soil was reportedly present around oil tanks number 1 and 2, and around lift number 5. The soil from around these areas was reportedly excavated and soil confirmation samples were collected. TPH-oil was detected at concentrations below 1,000 mg/kg, except for the Tank 1 and 2 excavation where further excavation would have undermined the building and, therefore, was not possible at that time.

Agency Name	Date	Occupant	Remarks
County	Various Dates	O'Reilly Auto Parts	Hazardous Materials Inventory List: Indicates used oils, flammable liquids, and corrosive liquids are stored on-Site.
County	Various Dates	Wheel Works	Hazardous Materials Inventory List: Indicates used oils, antifreeze, and other automotive fluids are stored on-Site.
1271 Tara Hills Drive			
County	Various Dates	Antique Restorations	Hazardous Material Inspection reports and inventories dated between 1989 and 2013. These documents indicate paint removers containing methylene chloride are stored on-Site. Inspection violations related to labeling and documentation were noted; however, no indications of spills or leaks were noted.
Water Board	11/17/1986	Rent-A-Rack	*Underground Storage Tank Removal Sampling Report*, Blaine Tech Services. This document is discussed further below
Water Board	12/27/2013	Rent-A-Rack	*Request for Case Closure, Former Rent-A-Rack*, Fugro Consultants, Inc. This site is discussed further below.
1401 Tara Hills Drive			
County	Various Dates	Longs Drugs and CVS Pharmacy	Hazardous waste inventory, inspection, business plans, and permits between 1995 and 2015. Documents indicate that hazardous materials associated with photographic processing equipment (silver-containing waste) is stored on-site. No documentation was noted indicating spills or leaks.
1421 Tara Hills Drive			
County	Various Dates	Safeway	Hazardous waste inventory, inspection, business plans, and permits; Documents indicate storage/use of refrigerants (Freon), helium, pressurized carbon dioxide, and miscellaneous cleaning products. No documentation was noted indicating spills or leaks.
1441 Tara Hills Drive			
County	Various Dates	Holiday Cleaners / Four Mile Cleaners	Hazardous material program inspection reports dated between 1989 and 2015. These documents note the use and storage of tetrachloroethene (PCE). Violations noted for improper documentation, training, and waste labeling.
1577 Tara Hills Drive (Off-Site)			
County	Various Dates	Appian 80 Cleaners	Hazardous material program inspection reports, hazardous material business plans, and inventory reports dated between 1989 and 2015. These documents indicate the storage and use of PCE, Stoddard solvent, and petroleum naphtha dry cleaning solved (DF-2000). Violations documented for improper documents and labeling.
DTSC	9/2014	Appian 80 Cleaners	*Interim Remedial Measures Work Plan*, West Environmental. Work plan to address the source of PCE at this facility. This document is discussed further below.
DTSC	7/24/2015	Appian 80 Cleaners	*Interim Data Submittal*, West Environmental. Summary of findings for activities conducted between March and June 2015. This document is discussed further below.

Agency Name	Date	Occupant	Remarks
DTSC	06/2018	Appian 80 Cleaners	*Final Removal Action Work Plan*, West Environmental. Work Plan to install soil vapor extraction system, install bioremediation system to facilitate enhanced in-situ degradation of VOCs within ground water, and monitor ground water attenuation.
DTSC	07/17/18	Appian 80 Cleaners	DTSC approval of the Removal Action Work Plan.

1201 Tara Hills Drive – Former Chevron Station

According to the *UST Closure Report* (Touchstone Development, 1997), the facility consisted of a Chevron-branded gasoline station with three 10,000-gallon gasoline USTs, one 1,000-gallon waste oil UST, three hydraulic hoists, and one oil/water separator reportedly that were installed in 1981. According to the site map presented in this report, the fuel USTs were located adjacent to Tara Hills Drive near the northwest corner of the property; the pump islands were located immediately east of the fuel USTs; the hoists and oil/water separator were located within the garage portion of the structure; and the waste oil UST was located adjacent and south of the structure. The approximate locations of the USTs are shown on Figure 2. The USTs and associated piping, dispensers, and hoists were removed on June 16, 1997 under the oversight of County Health. Confirmation soil samples were collected from each excavation as reportedly directed by County Health. The results from the samples collected reportedly indicated no significant impacts from the USTs, hoists, and oil/water separator. On July 31, 1997, the County concurred stating "*that the Site does not pose a threat to human health or the environment and will require no additional investigation or monitoring".* A copy of this case closure letter is provided in Appendix C. Based on this report, significant impacts from these underground structures do not appear likely.

According to the historical documents discussed below in Section 6, the Site appears to have been used as a gasoline service station since at least 1968. However, no files were available pertaining any the presence of USTs prior to the reported installation of the three gasoline USTs and one waste oil UST in 1981. The aerial photograph from 1981 shows what appears to be a newly-patched area where the USTs were documented to be installed in 1981. No other excavations were noted in that image. Presumably, any underground tanks in operation prior to 1981 were likely removed and replaced with the USTs that were in service between 1981 and 1997. However, it is uncertain if the previous USTs resulted in any subsurface impacts.

1271 Tara Hills Drive – Former Rent-A-Rack

In 1986, two 10,000-gallon gasoline USTs, one 1,000-gallon gasoline UST, and one 500-gallon waste oil UST reportedly were removed from the former Rent-A-Rack filling station. The USTs reportedly were located within the parking area east of the existing Antiques Restoration building. These USTs reportedly were installed in 1972. According to the sampling *Underground Storage Tank Removal Sampling Report* (Blaine Tech, 1986), elevated TPHg, benzene, toluene, and xylenes were detected in the two soil samples collected beneath the former 10,000-gallon gasoline USTs. In early 1987, the UST pit reportedly was excavated to a depth of approximately 26 feet to remove soil with TPHg concentrations greater than 100 mg/kg. Confirmation soil samples indicated the TPHg concentrations of the remaining in-place soil was below 100 mg/kg. The excavated soil was stockpiled and aerated on the adjacent parking lot.

Sampling was performed on the soil stockpile, but no documentation was available that indicated if any of this soil was used as backfill or whether the soil was transported off-Site for disposal.

In October 2013, six exploratory borings were advanced to a depth of up to 50 feet as reported in the *Request for Case Closure* report (Fugro Consultants, 2013). Soil samples were collected from three of the borings located within the former UST area at depths of up to approximately 37 feet. Ground water was observed in three of the six borings and ground water grab samples were collected from each of these borings (two located within the former UST area and one located down-gradient of the UST area). For the soil samples collected, elevated concentrations of TPHg were detected in one sample collected at a depth of approximately 17 feet in the area of the former USTs. For the ground water grab samples, elevated concentrations of TPHg, TPHd, TPHo, and benzene were detected in samples collected in the UST area. However, no TPHg, TPHd, TPHo, and VOCs were detected in the sample collected downgradient of the former USTs. Fugro concluded that the extent of petroleum-related impacts beneath the site was defined and limited to the area around the former UST and, therefore, qualified for closure under the Water Board's Low Threat Closure Policy (LTCP). Case closure was subsequently approved by the Water Board in a letter dated April 8, 2014. This letter indicated that *"residual contamination in both soil and ground water may remain at the Site that could pose an unacceptable risk under certain development activities such as site grading, excavation, or installation of water wells.*" The closure letter also indicated that *the Contra Costa County Health Services Department, and the appropriate planning and building department should be notified prior to any changes in land use, grading activities, excavation and installation or water wells.*" A copy of this case closure letter is provided in Appendix C.

In December 2015, Cornerstone attempted to collect a soil vapor sample from one soil vapor probe installed to a depth of approximately 5 feet. The vapor probe was installed using a direct push drilling rig at a location within the footprint of the former UST pit. Vapor sampling was not successful due to water accumulation within the vapor probe. Perched water appeared to have accumulated within the clayey material beneath the asphalt parking area. The water observed is believed to be perched as groundwater was not observed in borings later advanced to depths of up to approximately 10 feet.

On August 22, 2017, Cornerstone collected soil samples from four borings (EB-1 through EB-4) advanced to depths of up to approximately 10 feet within and adjacent to the approximate location of the former USTs. Results from this sampling event were reported in Cornerstone's *Site Management Plan* (SMP) dated September 20, 2017.

The detected concentrations of TPHd, TPHo, TPHg, and the VOCs toluene and total xylenes were below their respective commercial and construction worker ESLs. The detected concentrations detected were similar to those previously detected in 2013 prior to case closure by the Water Board.

Based on these detections, the SMP indicated that soil and/or groundwater with residual fuel-related impacts could be encountered during excavation around the former UST locations. If encountered, the SMP provides protocols for the special handling and disposal of such material.

4.2.2 Radon

Elevated levels of radon in indoor air are a result of radon moving into buildings from the soil, either by diffusion or flow due to air pressure differences. The ultimate source of radon is the uranium that is naturally present in rock, soil, and water. Some types of rocks are known to have uranium concentrations greater than others and, consequently, there is an increased chance of elevated radon concentrations in soils and weathered bedrock where they are located. Areas down-slope which received sediments and/or surface and ground water from rock units with above average uranium content also have an increased likelihood of elevated radon concentrations in soil gas. In California, bedrock that can contain above average uranium concentrations includes the Monterey formation, asphaltic rocks, marine phosphatic rocks, granitic rocks, felsic volcanic rocks, and certain metamorphic rocks.

The federal EPA has established an action level of 4 pCi/L, above which the EPA recommends taking action to reduce radon levels in structures. To help local, state, and federal agencies prioritize resources and implement radon-control building codes, the EPA published maps of radon hazards for each county in California (www.epa.gov/radon/zonemap/california.htm).

The Site is located in Contra Costa County, which is designated by the EPA as Zone 2 with a moderate potential (from 2 to 4 pCi/L). It is important to note that EPA has identified structures with elevated levels of radon in all three zones, and the EPA recommends Site-specific testing in order to determine radon testing at a specific location.

Based on information present in the previous regulatory agency database report (October 2015), nine radon screening tests have been performed in the Site vicinity (zip code 94564), with no results exceeding 4pCi/L.

4.2.3 Division of Oil, Gas and Geothermal Resources Maps

To evaluate the presence of oil or gas wells on-Site and in the immediate Site vicinity, maps available on-line at the California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (http://www.consrv.ca.gov/dog) were reviewed. Review of the available map for the Site area did not show oil or gas wells on-Site or on the adjacent properties.

4.2.4 Lead in Drinking Water

The East Bay Municipal Utility District (EBMUD) provides drinking water to the Site. The 2018 water quality report published by the EBMUD states that the 90th percentile concentration of lead detected was 2.4 µg/L, with no detections exceeding the drinking water standard established by the US EPA of 15 ppb.

SECTION 5: PHYSICAL SETTING

We reviewed readily available geologic and hydrogeologic information to evaluate the likelihood that chemicals of concern released on a nearby property could pose a significant threat to the Site and/or its intended use during our previous Phase I ESA performed for this Site, dated November 24, 2015. This information is included below.

5.1 RECENT USGS TOPOGRAPHIC MAP

A 2012 USGS 7.5 minute topographic map was reviewed to evaluate the physical setting of the Site. The Site's elevation is approximately 200 feet above mean sea level; topography in the vicinity of the Site slopes to the north-northwest towards the San Pablo Bay.

5.2 HYDROGEOLOGY

Based on our previous monitoring wells installed on-Site as presented in the California Geotracker database, depth to the shallow ground water beneath the Site appears to be highly variable, ranging between depths of approximately 4 to 20 feet. The reported ground water flow in this shallow zone ranges between the southwest to northwest.

SECTION 6: HISTORICAL USE INFORMATION

The objective of the review of historical use information is to develop a history of the previous uses of the Site and surrounding area in order to help identify the likelihood of past uses having led to Recognized Environmental Conditions at the property. The ASTM standard requires the identification of all obvious uses of the property from the present back to the property's first developed use, or back to 1940, whichever is earlier, using reasonably ascertainable standard historical sources.

6.1 HISTORICAL SUMMARY OF SITE

The historical sources reviewed are summarized below. The results of our review of these sources are summarized in Table 7.

- **Historical Aerial Photographs:** We reviewed aerial photographs dated between 1939 and 2012 obtained from EDR and Quantum Spatial; copies of aerial photographs reviewed are presented in Appendix D.

- **Historical Topographic Maps:** We reviewed USGS 15-minute and 7.5-minute historic topographic maps dated 1895, 1915, 1948, 1949, 1959, 1968, 1973, 1980, 1993, and 1995; copies of historic topographic maps reviewed are presented in Appendix D.

- **Historical Fire Insurance Maps:** EDR reported that the Site was not within the coverage area of fire insurance maps.

- **Local Street Directories:** We reviewed city directories obtained from EDR that were researched at approximately 5 year intervals between 1922 and 2013 to obtain information pertaining to past Site occupants. The city directory summary is presented in Appendix E.

Table 7. Summary of Historical Source Information for Site

Date	Source	Comment
1895, 1915, 1948, 1949, and 1959	Topographic Maps	No structures are depicted on the maps
1939, 1946, and 1950	Aerial Photographs	Site appears vacant. The natural topography appears to consist of rolling hills across the Site.
1958	Aerial Photographs	Some grading appears to have occurred in the central portion of the Site. The adjacent Interstate 80 and associated interchanges is present.
1968 and 1971	Aerial Photographs	Beginning with the 1968 image, the Site has been developed and consists of two structures at the northwest corner of the Site (1201 and 1211 to 1221 addresses), one large structure in the center of the Site (1401 to 1499 addresses), and a surrounding parking lot. An "L"-shaped structure is present at the northeast corner that appears to be a service station. The 1971 image is similar to the 1968 image.
1968 and 1973	Topographic Maps	Three structures are depicted starting with the 1968 map.
1974 and 1975	Aerial Photographs	Two new structures are present at the 1271 address, with one that appears to be a canopy, similar to what is used at fueling stations. A new rectangular structure is present north of the 1501 address.
1975	City Directory	1201: Regalias Chevron 1211: Winchell Donut House 1213: The Flower Hut 1215: J RS Jewelry 1221: Bank of America 1271: Car Care Center 1401: Longs Drugs 1409: Fotomat Drive Thru 1421: Safeway 1431: Baby News 1441: One Hour Martinizing 1451: Burger Haven 1461: Quill Stationary and Gift 1481: Silveridge Lounge 1491: Sybals Silveridge Barber Salon 1499: Marjories Appian 80 1511: Lafayette Federal Savings
1976	Aerial Photographs	A new square-shaped structure is present at the 1501 address.
1978	Aerial Photographs	The building at the 1211 to 1221 addresses has been expanded south to include the 1251 address. A new structure is present at the 1565 to 1577 addresses. The rectangular structure north of the 1501 address is no longer present.

Date	Source	Comment
1980	City Directory	1201: Regalias Chevron 1211: Winchell Donut House 1213: The Flower Hut 1215: J RS Jewelry 1221: Bank of America 1251: Super Auto 1261: Fotomat Corporation 1271: Car Care Center 1401: Longs Drugs 1421: Safeway 1451: Lilys Garden Restaurant 1481: Silveridge Lounge 1491: Sybals Silveridge Barber Salon 1499: Marjories Appian 80 1501: Mi Place Pizza 1565: Lafayette Federal Savings 1569: La Vals Stuffery 1573: Sports Corner 1577: Super Scoop
1980	Topographic Maps	Eight structures are depicted on Site.
1981	Aerial Photographs	Overall the Site layout is similar. What appears to be a rectangular asphalt patch is present adjacent and east of the Chevron Station (1201). This apparent patch corresponds to the location of the USTs that were installed in 1981.
1982 and 1983	Aerial Photographs	The Site is similar to the 1981 image.
1985	City Directory	1201: Regalias Chevron 1211: Winchell Donut House 1213: The Flower Box 1215: J RS Jewelry 1221: Bank of America 1251: Super Auto 1271: Antique Restoration 1401: Long's Drugs 1409: Fotomat Corporation 1421: Safeway 1481: Silveridge Lounge 1491: Sybals Silveridge Style Salon 1499: Marjories Appian 80 1501: Mi Place Pizza 1565: Capitol Federal Savings 1569: La Vals Stuffery 1573: American Protective Services 1577: Appian 80 Express Cleaners
1988	Aerial Photographs	Construction of the building at the 1261 address is present in the 1988 image. The apparent canopy is no longer present at the 1271 address. What appears to be 2 concrete or asphalt patches are present in its former location.

Date	Source	Comment
1990	City Directory	1201: Regalias Chevron 1211: Winchell Donut House 1213: Pinole Key & Gift Shop 1215: Allstar Sportscard 1221: Bank of America 1251: Super Auto 1261: Super Car Wash 1271: Antique Restoration 1401: Long's Drugs 1409: Fotomat Corporation 1421: Safeway 1431: Video International 1441: Holiday Cleaners 1481: Silveridge Lounge 1499: Sybals Silveridge Style Salon 1501: Cybelles Pizza 1565: Capitol Federal Savings 1569: Stuffery La Vals 1573: Automatic Appliance 1577: Appian 80 Express Cleaners
1992	City Directory	1201: Regalias Chevron 1211: Winchell Donut House 1213: Pinole Key & Gift Shop 1215: Lisa's Nails 1251: Super Auto 1261: Super Car Wash 1271: Antique Restoration 1401: Long's Drugs 1421: Safeway 1431: Video International 1441: Holiday Cleaners 1481: Silveridge Lounge 1499: Sybals Silveridge Style Salon 1501: Cybelles Pizza 1565: Capitol Federal Savings 1569: Stuffery La Vals 1573: Automatic Appliance 1577: Appian 80 Express Cleaners
1993 and 1995	Topographic Maps	No features are depicted on these maps.
1993	Aerial Photographs	A new structure is present at the 1261 address.

Date	Source	Comment
1995	City Directory	1201: Regalias Chevron 1211: Pizza Hut 1213: Pinole Key & Gift Shop 1215: Lisa's Nails 1221: Bank of America 1251: All Cars Inc. / Super Auto 1261: Appian 80 Car Wash 1271: Antique Restoration / Shaker Furniture Showroom 1401: Long's Drugs 1421: Safeway 1441: Four Mile Cleaners 1481: Silveridge Lounge 1499: Sybals Silveridge Style Salon 1501: Peking Garden Restaurant 1565: San Francisco Federal Savings 1569: Boun Thai Cuisine 1573: Automatic Appliance 1577: Appian 80 Express Cleaners
1998	Aerial Photographs	The Chevron Service Station located at the 1201 address is no longer present. The remainder of the Site is similar.
1999	City Directory	1211: Pizza Hut 1213: Pinole Key & Gift Shop 1215: Lisa's Nails 1251: Grand Auto Supply 1261: Appian 80 Car Wash 1271: Antique Restoration / Shaker Furniture Showroom 1401: Long's Drugs 1421: Safeway 1431: Tropical Fish & Pet Shop 1441: Four Mile Cleaners 1481: Silveridge Lounge 1499: Sybals Silveridge Style Salon 1501: Peking Garden Restaurant 1569: Bangkok Thai Cuisine 1577: Appian 80 Express Cleaners
2003	City Directory	1211: Pizza Hut 1213: Pinole Key & Gift Shop 1215: Waikiki Nails 1251: Kragen Auto Parts / Tires Plus 1271: Shaker Furniture Showroom 1421: Safeway 1431: Tropical Fish & Pet Shop 1441: Jung Lee 1501: China Delights 1569: Bangkok Thai Cuisine 1573: Blockbuster Video / Ladies Workout Express 1577 Appian 80 Express Cleaners
2005, 2009, and 2012	Aerial Photographs	The Site is similar to the 1998 image.

Date	Source	Comment
2008	City Directory	1211: PAC Pizza Inc. / Pizza Hut 1213: Pinole Key & Gift Shop 1215: Waikiki Nails 1251: Kragen Auto Parts / Wheel Works 1261: Bubbles Car Wash & Center 1271: Antique Restoration 1401: Long's Drugs 1421: Safeway 1431: Tropical Fish & Pet Shop 1441: Best Cleaning Valet Service / Four Mile Cleaners 1481: Bar None 1501: China Delights 1565: California Federal Bank / Citi Bank 1573: Blockbuster Video / Ladies Workout Express
2013	City Directory	1211: Locksmith 24 hr / Pizza Hut 1213: Pinole Key & Gift Shop 1215: Waikiki Nails 1251: O'Reilly Auto Parts / Wheel Works 1261: Bubbles Car Wash & Center 1271: Antique Restoration 1401: CVS Pharmacy 1421: Safeway 1431: Tropical Fish & Pet Shop 1441: Best Cleaning Valet Service / Four Mile Cleaners 1481: Bar None / Safe and Locks 1501: A Emergency Locksmith Services / China Delights 1573: Ladies Workout Express 1577: Appian 80 Express Cleaners

6.2 HISTORICAL SUMMARY OF SITE VICINITY

Based on our review of the information described in Section 6.1, the general Site vicinity appears to have historically consisted mainly of vacant/undeveloped land with little agricultural activities. By 1958, Interstate 80 and the Appian Way interchanges were constructed. By 1968, much of the Site vicinity had been developed with mostly residential properties and few commercial properties, mainly located near Appian Way. By 1982, a portion of the commercial development south of Interstate 80 is present. By 1993, the Site vicinity development appears similar to the current.

SECTION 7: SITE RECONNAISSANCE

We performed a Site reconnaissance to evaluate current Site conditions and to attempt to identify Site Recognized Environmental Conditions. The results of the reconnaissance are discussed below. Additional Site observations are summarized in Table 8 in Section 7.2. Photographs of the Site are presented in Section 7.2.1.

7.1 METHODOLOGY AND LIMITING CONDITIONS

To observe current Site conditions (readily observable environmental conditions indicative of a significant release of hazardous materials), Cornerstone staff Ms. Sarah E. Kalika, P.G., visited the Site on May 10, 2019, and was accompanied for a portion of the visit by Mr. Mark Goldstone of Hillsboro Properties. Site reconnaissance was conducted by walking representative areas of the Site, including the interior(s) of the on-Site structure(s), the periphery of the structure(s) and the Site periphery. Cornerstone staff only observed those areas that were reasonably accessible, safe, and did not require movement of equipment, materials or other objects. Physical obstructions that limited our ability to view the ground surface at the Site included asphalt paved vehicle drives and parking areas (typical of developed properties).

7.2 OBSERVATIONS

During our Site visit, the Site was observed to consist of five structures and appurtenant parking and landscaped areas. The southern border of the Site was observed to be a steep, grass covered hill that sloped towards a drainage swale located off-Site and adjacent to Interstate 80. Signage for a petroleum pipeline was observed along this border. The parcel located at 1201 Tara Hills Drive was observed to be vacant and covered with gravel. No readily apparent surficial indications of the former USTs or service station were observed.

The on-Site buildings consisted of a five-unit structure with addresses of 1211 to 1251 Tara Hills Drive, a six-unit structure with addresses of 1401 to 1491 Tara Hills Drive, and single unit structures with addresses of 1261 and 1271 Tara Hills Drive. The occupants were observed to be those listed in Table 1.

No environmental concerns were noted at the Key's and Gift Shop (1213 Tara Hills Drive), Nail Salon (1215 Tara Hills Drive), vacant former CVS Pharmacy (1401 Tara Hills Drive), Safeway (1421 Tara Hills Drive), Bar None (1481 Tara Hills Drive), and the fitness gym (1573 Tara Hills Drive). Small quantities of cleaners were observed within these businesses that were stored in properly labeled containers. No signs of spills or leaks were noted. During our site visit, the restaurant at 1215 Tara Hills Drive and the bank at 1221 were not accessed. However, the exterior of each business was observed, and cooking grease/oil containers were observed at the restaurant. No evidence of spills or leaks were noted at these properties. The inaccessibility of these units is not considered a data gap as the business types are generally associated with activities that are use significant quantities of hazardous materials.

The vacant space (formerly occupied by O'Reilly Auto Parts with an address of 1251 Tara Hills Drive) contained shelving racks and general garbage and debris related to a transient campsite. Duriong our Site visit, the space was being cleared by a junk hauling company. No remaining hazardous materials were observed.

The vacant space (formerly occupied by Wheel Works also listed at 1251 Tara Hills Drive) was vacant and unoccupied. No remaining hazardous materials were observed.

The vacant building (formerly occupied by Bubble's Car Wash with an address of 1261 Tara Hills Drive) consisted of an open area where the automatic car wash used to be located, utility/storage room, and a vacant area that appeared to be a former customer reception/waiting area. The interior of the former automatic car was enclosure appeared to be vandalized and damaged by fire. No remaining hazardous materials were observed.

The vacant building (formerly occupied by Antique Restoration with an address of 1271 Tara Hills Drive) consisted of a vacant space. A large pile of debris consisting of wood, metal, cardboard, pieces of carpet and carpet padding, and other items was covered by a large piece of carpet. A clothes washer was observed near the debris pile. In another room, a mattress was observed. Several former exploratory borings associated with previous sampling events discussed above were also observed in the parking area outside of this business.

The vacant space formerly occupied by Four Mile Cleaners at 1441 Tara Hills Drive was cleared of all equipment. No hazardous materials were observed within the unit.

Table 8. Summary of Readily Observable Site Features

General Observation	Comments
Aboveground Storage Tanks	Not Observed
Agricultural Wells	Not Observed
Air Emission Control Systems	Not Observed
Boilers	Not Observed
Burning Areas	Not Observed
Chemical Mixing Areas	Not Observed
Chemical Storage Areas	Observed – small volumes of containerized cleaners observed in several businesses.
Clean Rooms	Not Observed
Drainage Ditches	Not Observed
Elevators	Not Observed
Emergency Generators	Not Observed
Equipment Maintenance Areas	Not Observed
Fill Placement	Not Observed
Ground Water Monitoring Wells	Observed – related to release at 1577 Tara Hills Drive
High Power Transmission Lines	Not Observed
Hoods and Ducting	Not Observed
Hydraulic Lifts	Not Observed
Incinerator	Not Observed
Petroleum Pipelines	Observed – signage along the southern border of the Site
Petroleum Wells	Not Observed
Ponds or Streams	Not Observed
Railroad Lines	Not Observed
Row Crops or Orchards	Not Observed
Stockpiles of Soil or Debris	Not Observed
Sumps or Clarifiers	Observed – inactive oil/water separator observed at the car wash. Oil/grease separators observed at the restaurants.
Transformers	Observed, pole-mounted transformers labeled as non-PCB
Underground Storage Tanks	Not Observed
Vehicle Maintenance Areas	Not Observed
Vehicle Wash Areas	Not Observed
Wastewater Neutralization Systems	Not Observed

The comment “Not Observed” does not warrant that these features are not present on-Site; it only indicates that these features were not readily observed during the Site visit.

7.2.1 Site Photographs

Photograph 1. View of Site at looking southwest.

Photograph 2. View of Site looking west.

Photograph 3. View of Site looking south.

Photograph 4. Vacant parcel at 1201 Tara Hills Drive (former Chevron Station).

Photograph 5. View of southwest corner of Site (former car wash and former antiques restoration).


Photograph 6. Former car wash structure.

Photograph 7. Car wash automatic wash bay.

Photograph 8. Drains associated with former car wash.

Photograph 9. Former Antiques Restoration structure.

Photograph 10. Interior of former Antiques Restoration.

Photograph 11. Additional room inside former Antiques Restoration.

Photograph 12. Pile of debris and discarded washing machine within former Antiques Restoration structure.

Photograph 13. Additional view of debris pile.

Photograph 14. Interior (rear) of Safeway (photo from 2015).

Photograph 15. Storage room containing cleaning products within Safeway store (photo from 2015).

Photograph 16. Rear of Safeway showing box crushing machine (photo from 2015).

Photograph 17. Pole-mounted transformer labeled “non-PCB”.

Photograph 18. Loading dock area at rear of former CVS Pharmacy.

Photograph 19. Rear of Safeway store.


Photograph 20. 55-gallon drums observed in loading dock area behind Safeway.

Photograph 21. Interior of former CVS Pharmacy.

Photograph 22. Rear storage area of former CVS Pharmacy.

Photograph 23. Electrical control panel within former CVS Pharmacy.

Photograph 24. Front entry counter at former Wheel Works.

Photograph 25. Bay area of former Wheel Works.

Photograph 26. Storage racks within former Wheel Works.

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Photograph 27. Interior of former O’Reilly Auto Parts store.

Photograph 28. Alternate view of former O’Reilly Auto Parts store.

Photograph 29. Electrical control panel and floor staining within former O'Reilly Auto Parts store.

Photograph 30. Exterior of former Four Mile Cleaners and adjacent former pet store.

Photograph 31. Interior of former Four Mile Cleaners.

Photograph 32. Disconnected vents within former Four Mile Cleaners.

Photograph 33. Previous location of dry cleaning equipment.

Photograph 34. Previous location of dry cleaning equipment.

Photograph 35. Exterior of restaurant located in south east corner of Site.

Photograph 36. Monitoring well and structure with restaurant, gym, and dry cleaner in northeast corner of Site.

SECTION 8: ENVIRONMENTAL QUESTIONNAIRE AND INTERVIEWS

8.1 ENVIRONMENTAL QUESTIONNAIRE / OWNER INTERVIEW

To help obtain information on current and historical Site use and use/storage of hazardous materials on-Site, we provided an environmental questionnaire during our previous investigation in 2015, to Hillsboro Properties and they were asked to forward the questionnaire to the owners of the other units at the Site (Appian 80 LP, Thomas G. Paulson Trust, Nga Tran, John Johnson, Arco Building Company, and Tara Hills Drive, LP) for completion. Mr. Christopher Paulson from the Thomas G. Paulson Trust and Mr. John Johnson from Antiques Restoration completed their respective questionnaires in 2015. The questionnaire from Mr. Paulson acknowledged the former use of 1201 Tara Hills Drive as a Chevron-branded gasoline station and acknowledged the former presence of USTs. The questionnaire from Mr. Johnson acknowledged the former use of 1271 Tara Hills Drive as a Car care center with two USTs that were removed in 1987. Copies of these completed questionnaires are provided in Appendix F. The completed questionnaires from the remaining owners were not returned to us. We additionally interviewed Mr. Mark Goldstone of Hillsboro Properties during our 2015 Site visit and Mr. Carl Goldstone of Hillsboro Properties via email and telephone communication in 2015. Paul Goldstone Enterprises is associated with Hillsboro Properties and owns a portion of the Site. Much of the historical Site information and current use information used in this report was provided by Hillsboro Properties.

In preparation for this Phase I ESA Update, we asked Mr. Carl Goldstone for updates to the Site questionnaire. Mr. Goldstone reported that the former Antiques Restoration portion of the Site is now owned by Pinsquare 1, LLC and that the former Chevron Station at 1201 Tara Hills Drive is now owned by Pinsquare 2, LLC. He stated that Pinquare 1, LLC and Pinsquare 2, LLC are owned by Hillsboro Properties. He additionally stated that he did not have an updated title report.

8.2 INTERVIEWS WITH PERSON(S) KNOWLEDGEABLE OF SITE USE

Contact information for persons knowledgeable of existing and prior site uses was not provided to us prior to or at the Site visit.

8.3 INTERVIEWS WITH PREVIOUS OWNERS AND OCCUPANTS

Contact information for previous Site owners and occupants was not provided to us. Therefore, interviews with previous Site owners and occupants could not be performed.

SECTION 9: PRELIMINARY SOIL VAPOR EVALUATION

As noted above, Four Mile Cleaners was formerly located on-Site at 1441 Tara Hills Drive. In addition, there is an off-Site and adjacent drycleaner (Appian 80 Cleaners located at 1577 Tara Hills Drive) (Figure 2). PCE subsurface impacts from the off-Site cleaners have been documented and the adjacent property is currently undergoing remediation under DTSC oversight. The on-Site dry cleaner previously used PCE as a dry cleaning solvent as indicated in the County records reviewed.

Cornerstone directed a subsurface investigation and advanced six borings to depths of up to approximately 5 feet for the installation of temporary soil vapor probes (SV-1 through SV-6). Soil vapor sampling was attempted at each probe to determine if the former on-Site dry cleaner (former Four-Mile Cleaners) impacted the subsurface and/or if the documented PCE subsurface impacts from the existing off-Site dry-cleaner (Appian 80) have significantly impacted the Site. The six boring locations were positioned as follows:

- Boring SV-1 was positioned along the western exterior of the former on-Site drycleaner.
- Boring SV-2 was positioned within the interior of the former on-Site dry cleaner.
- Boring SV-3 was positioned along the northern exterior of the on-Site former dry cleaner.
- Boring SV-4 was positioned approximately 175 feet from the northern property boundary closest to the off-Site drycleaner.
- Boring SV-5 was positioned approximately 125 feet from the northern property boundary closest to the off-Site drycleaner.
- Boring SV-6 was positioned approximately 50 feet from the northern property boundary closest to the off-Site drycleaner.

9.1 SUBSURFACE MATERIALS

The subsurface materials observed in the exploratory borings generally consisted of sandy clay. Some gravel was observed between a depth of approximately 2 and 5 feet in all borings except SV-1 and SV-5. No apparent chemical odors were observed in the exploratory borings. Ground water was not observed in any of the borings. The lithologic observations are included on the boring logs in Appendix F.

9.2 ORGANIC VAPOR READINGS

Soil samples retrieved from the exploratory borings were monitored with a MiniRAE 3000 Organic Vapor Meter (OVM) to record VOC vapors. No organic vapor readings were measured in the soil samples screened from each boring.

9.3 SOIL VAPOR QUALITY EVALUATION

On May 24, 2019, Cornerstone oversaw the installation of six temporary soil vapor probes (SV-1 through SV-6) using a direct push drilling rig. The temporary soil vapor probes were installed following the general requirements of the July 2015 document entitled, “Advisory: Active Soil Gas Investigations”, prepared by the DTSC.

9.4 TEMPORARY SOIL VAPOR PROBE INSTALLATION AND SAMPLE COLLECTION

The six temporary soil vapor probes were installed to depths of approximately 4½ to 5 feet at each location. Each probe was completed with stainless steel expendable tip and screen affixed to stainless steel tubing. Each probe was constructed by first placing approximately ½ foot of coarse aquarium-type sand into the bottom of the boring. The stainless steel tip and tubing was then lowered into the boring via a tremie pipe. Additional sand was then placed in the boring via tremie when needed to create an approximately 1 foot sand pack interval around the vapor tip. Approximately 1 foot of granular bentonite was placed on top of the sand pack. Hydrated bentonite was then placed down the boring; the mixture consisted of approximately 50 percent water to bentonite and was placed in less than ½ foot lifts to just below the surface. The stainless steel tubing was labeled with depth of placement and capped utilizing a vapor-tight Swagelok valve set in the “off” position.

The temporary vapor probes were sampled on May 27, 2015, approximately 72 hours after installation. The DTSC guidance recommends sampling at least 2 hours after installation for soil vapor probes installed using direct push drilling. A 167 milliliters-per-minute flow regulator inclusive of a particulate filter was fitted to the shut-off valve and the other end to a “T” fitting. A Summa canister was connected to the “T” fitting. The other end of the “T” fitting was affixed to a digital vacuum gauge and a 1-liter Summa canister utilized for purging.

A minimum 10 minute vacuum tightness test was performed on the manifold and connections by opening and closing the 1-liter purge canister valve and applying and monitoring a vacuum on the vacuum gauge. The sample shut-off valve on the downhole side of the sampling manifold remained in the “off” position. When gauge vacuum was maintained for at least 10 minutes without any noticeable decrease (less than approximately 0.1 inches of mercury (Hg) for properly connected fittings), purging began. The downhole shut off valve was opened and approximately three purge volumes of vapor were removed using the purging 1-liter Summa. The volume of vapor removed was verified by the calculated versus observed pressure drop in the purging Summa canister. The purge volume was calculated based on the length and inner diameter of the sampling probe and the connected sampling tubing and equipment. Assuming the vapor probe was properly sealed, the borehole sand pack vapor space will have equilibrated with the surrounding vapors following the more than 48 hour equilibration period. Thus, the sand pack vapor space was not included in the purge volume calculation.

Samples were successfully collected from temporary soil vapor probes SV-1 through SV-4. However, soil vapor samples could not be collected from probes SV-5 and SV-6 due to the tight clay subsurface materials. Soil vapor sampling field notes and logs are included in Appendix F.

9.5 SOIL VAPOR LABORATORY SAMPLING AND ANALYSES

Cornerstone collected soil vapor samples from temporary probes SV-1 through SV-4 in laboratory-provided cannisters and submitted the samples for analysis to a state-certified analytical laboratory under a chain of custody control. The four samples were analyzed for TPHg and VOCs (EPA Test Method TO-15SIM). In addition, one air sample collected from the shroud atmosphere was analyzed for isopropyl alcohol. As noted, soil vapor samples could not be collected from probes SV-5 and SV-6.

9.6 SOIL VAPOR ANALYTICAL SUMMARY

The detected soil vapor concentrations were compared to the Tier 1 ESLs (Water Board, 2019). Since the land-use will be commercial, the detected concentrations were also compared to the commercial direct exposure ESLs (Water Board, 2019). Detected compounds are presented in Table A. Chain of custody documentation and laboratory analytical reports are presented in Appendix H.

A summary of the analytical results is presented below:

- Trichloroethene (TCE) was detected at concentrations of 320 µg/m^3 and 4,800 µg/m^3 in the samples collected from SV-3 and SV-4, respectively. The Tier 1 ESL for TCE is 16 µg/m^3 and the commercial ESL is 100 µg/m^3. TCE was detected in SV-1 and SV-2 but at concentrations below the Tier 1 ESL.

- PCE was detected below the Tier 1 ESL, at a maximum concentration of 12 µg/m^3.

- Cis-1,2-dichloroethene (cDCE) exceeded the Tier 1 ESL of 280 µg/m^3 in the four soil vapor samples collected, with detections ranging from 540 µg/m^3 at SV-1 to 9,500 µg/m^3 at SV-3. The detected concentration in SV-3 exceeded the commercial direct exposure ESL of 1,200 µg/m^3.

- Trans-1,2-Dichloroethene (tDCE) exceeded the Tier 1 ESL of 2,800 µg/m^3 in the soil vapor sample collected from SV-3, with a detected concentration of 3,800 µg/m^3. This detected concentration was below the commercial direct exposure ESL of 12,000 µg/m^3. Samples collected from the three remaining soil vapor probes had concentrations of tDCE below the Tier 1 ESL.

- Vinyl Chloride exceeded the Tier 1 ESL of 0.32 µg/m^3 and the commercial direct exposure ESL of 5.2 µg/m^3 in the four soil vapor samples collected, with detections ranging from 62 µg/m^3 at SV-4 to 3,500 µg/m^3 at SV-3.

- TPHg was detected at a concentration of 15,000 µg/m^3 at SV-4, which is above the Tier 1 ESL of 3,300 µg/m^3 but below the commercial direct exposure ESL of 83,000 µg/m^3.

- Benzene was detected at concentrations exceeding the Tier 1 ESL of 3.2 µg/m^3 in three of four soil vapor samples collected, ranging in concentrations from 14 µg/m^3 in SV-2 to 130 µg/m^3 in the sample collected for SV-4. The benzene soil vapor concentration detected in the sample from SV-4 also exceeded the commercial direct exposure ESL of 14 µg/m^3.

TCE, cDCE, tDCE, and vinyl chloride were detected at concentrations exceeding their respective Tier 1 and commercial ESLs. PCE was detected at low concentrations below the Tier 1 ESL. In anerobic conditions, PCE can degrade to TCE, cDCE, tDCE, and vinyl chloride through the sequential replacement of chlorine atoms with hydrogen atoms (dechlorination). During degradation, the concentrations of PCE will decrease giving way to increased concentrations of its daughter products (TCE, cDCE, tDCE, and vinyl chloride). The on-Site drycleaner reportedly used PCE during normal operations based on agency files Cornerstone reviewed. The low concentrations of PCE and higher concentrations of its daughter products may indicate an older PCE release that is degrading to its daughter products.

SECTION 10: FINDINGS, OPINIONS AND CONCLUSIONS (WITH RECOMMENDATIONS)

Cornerstone performed this Phase I ESA in general accordance to ASTM E1527-13 to support Hillsboro Properties in evaluation of Recognized Environmental Conditions. Our findings, opinions and conclusions are summarized below.

10.1 HISTORICAL SITE USAGE

Based on information reviewed during this study, the Site was vacant/undeveloped until approximately 1966 when structures were built at the addresses of 1201, 1211 to 1221, and 1401 to 1499 Tara Hills Drive. Initially, the businesses consisted of a Chevron service station, retail commercial businesses, restaurants, pharmacy, grocery store, photograph processing business, and a dry cleaner. Additions to the shopping center occurred by 1978 (1251 and 1271) and by 1993 (1261 Tara Hills Drive). The Chevron Station was reportedly demolished by 1997. A second fueling station (Rent-A-Rack) was formerly located at 1271 Tara Hills Drive from approximately 1972 until 1986. The dry cleaner business located at 1441 Tara Hills Drive operated from at least 1975 until its closure in approximately 2017.

10.2 CHEMICAL STORAGE AND USE

Hazardous material storage and use is documented at Safeway. These materials mostly consist of cleaning products. No spills or leaks were observed during our Site visit or were indicated in the records reviewed.

CVS Pharmacy (formerly Long’s Drugs), Antique Restoration, Bubbles Car Wash & Center, O’Reilly Auto Parts (formerly Kragen Auto Parts and Super Auto), and the former Fotomat business are now vacant. Previously, these businesses used and stored hazardous. During our previous Site visit, no spills or leaks were observed at the CVS Pharmacy, Antique Restoration, Bubbles Car Wash, or O’Reilly Auto Parts. The Fotomat business was no longer in operation during our previous Site visit. Based on our Site visits and records reviewed, these former businesses are not expected to have significantly impacted the Site.

Hazardous materials were used and stored at the former Chevron and Rent-A-Rack businesses. These facilities are further discussed in Section 9.4.

A dry cleaner formerly operated at 1441 Tara Hills Drive at least 1975 until approximately 2017 and operated under the names of One Hour Martinizing, Holiday Cleaners, and Four Mile Express Cleaners. Hazardous materials records indicate the prior use of PCE as a dry-cleaning solvent. No investigations appear to have been previously performed to determine if soil, soil vapor, or ground water impacts are present due to the prior use of PCE at this unit. As such, Cornerstone collected soil vapor samples from beneath and adjacent to the former dry-cleaning unit as discussed in Section 9. Results from the soil vapor samples collected detected of TCE, cDCE, tDCE, and vinyl chloride at concentrations that exceed their Tier 1 ESLs, and in some samples, also exceed the commercial direct exposure ESLs. The highest concentrations were detected in the sample collected adjacent to and north of the former dry cleaner. The VOCs detected are degradation products of PCE, which was previously used as a dry-cleaning solvent. These soil vapor detections may have resulted from an old PCE release from the dry cleaner that has since degraded to its daughter products. We recommend the collection of additional samples, including soil and groundwater, to determine if a source area is present in or near the drycleaner.

10.3 FORMER USTS

Fueling and waste oil USTs were formerly located on Site at the former Chevron service station (1201 Tara Hills Drive) and the Rent-A-Rack service station (1271 Tara Hills Drive). In addition, hydraulic lifts and associated oil tanks were formerly located at the Super Auto business (1251 Tara Hills Drive) and the Chevron Service Station.

According to the *Hydraulic Lift Removal Report* (Walker's Hydraulics, 1997), five hydraulic lifts and associated oil tanks were removed from Super Auto (1251 Tara Hills Drive). TPHo impacted soil was reportedly encountered around two of the tanks, and soil was subsequently excavated. However, the report indicates that some TPHo soil was not excavated due to the risk of undermining the building. Based on this report, there appears to be TPHo impacted soil beneath this facility. Although, the extent appears limited to these former tanks, any impacted soils encountered during construction may require special handling and disposal. Following demolition, soil exceeding commercial screening levels that was previously left in place should be removed for appropriate off-Site disposal. Cornerstone prepared a SMP dated September 20, 2017 that provided protocols for handling such material.

Two 10,000-gallon gasoline USTs and one 5,000-gallon waste oil UST were present at the Rent-A-Rack service station, located at 1271 Tara Hills Drive (former Antiques Restoration business). The tanks were reportedly removed in 1986. Sampling performed in October 2013 detected elevated concentrations of TPHg in soil and TPHg, TPHd, TPHo, and benzene in ground water. These elevated concentrations were detected in samples collected in the area of the former USTs. These compounds were not detected in samples collected downgradient of the tanks, indicating the extent of impacts appeared limited to the area beneath the former USTs. Although this facility was closed under the Water Board's LTCP, areas of isolated impacted soil could be encountered during construction that would require special handling. Our recommendations for handling any impacted soil are included in Section 9.9. Cornerstone's SMP provides protocols for handling such material.

A Chevron service station was present at 1201 Tara Hills Drive from at least 1975 until 1997. Documentation was reviewed related the installation of four USTs in 1981. These USTs along with three hydraulic hoists and one oil/water separator were removed in 1997. Soil samples collected from the excavations indicated no soil impacts resulted from these buried structures, and the County subsequently closed this facility. No documentation was available related to the USTs present before 1981. These USTs were presumably replaced in 1981. Since the sampling associated with the UST closure in 1997 revealed no significant impacts, significant impacts from the original USTs, if present, does not appear likely. However, any impacted soils encountered during construction may require special handling. The protocols presented in the SMP (2017) can be applied to work in this area as well.

10.4 OIL/WATER SEPARATORS

Oil/water separators (OWSs) were previously observed at 1251 Tara Hills Drive (former Wheel Works) and 1261 Tara Hills Drive (former Bubbles Car Wash). OWSs treat wash water by allowing oils and greases to float to the surface for separation and substances heavier than water to sink. If OWSs are not maintained on a regular basis, oil/grease (and potentially other chemicals used on-Site) can be discharged to the sewer during high flow period. Sludge can also build up in OWSs. We recommend that an environmental professional observe the underlying soil following demolition of these structures. If apparent stains are observed, we recommend collecting soil samples for analyses. If significant impacts are detected, the business operators should be responsible for costs associated with excavation and removal of the soil.

10.5 UNDOCUMENTED FILL

Fill soil was used during the backfilling of the UST pits located at 1201 and 1271 Tara Hills Drive. The source and quality of this soil is not known. Cornerstone collected soil samples from one boring that is believed to be located within the former UST excavation fill from 1271 Tara Hills Drive (Rent A Rack). Petroleum hydrocarbons and VOCs were detected in this sample, but at concentrations below their respective commercial direct exposure ESLs. If removed, this soil likely will require disposal at a landfill. The fill material within the UST pit located at 1201 Tara Hills Boulevard was not sampled.

10.6 DISPOSAL OF EXCESS SOIL DURING CONSTRUCTION

Contaminated soil may be present at the former UST locations and the former dry cleaning location. If present, this soil may require special handling and disposal considerations.

10.7 IMPORTED SOIL

If the planned development will require importing soil for Site grading, we recommend documenting the source and quality of imported soil. The DTSC's October 2001 Clean Fill Advisory provides useful guidance on evaluating imported fill.

10.8 POTENTIAL ENVIRONMENTAL CONCERNS WITHIN THE SITE VICINITY

UST releases have been documented at the facilities located at 2298 Appian Way and 1599 Tara Hills Drive. Investigations conducted at both facilities indicate that impacts appear limited to the soil and ground water beneath each facility and do not appear to have migrated to the Site. The facility at 1599 Tara Hills Drive was granted regulatory closure. As such, these facilities are not likely to impact the soil and/or ground water quality beneath the Site. Note, however, that there is litigation on-going between the owner of 1565 to 1577 Tara Hills Drive and the owner of 1599 Tara Hills Drive due to alleged indoor air quality impacts associated with the former Texaco station.

One dry cleaner is currently present adjacent to the Site: Appian 80 Express Cleaners at 1577 Tara Hills Drive. A PCE release to the soil and ground water has been documented at this dry cleaner. The highest concentrations in subsurface media were detected beneath the boiler room within the dry-cleaning business. Groundwater flow direction appears to be to the west-northwest. Previous groundwater sampling detected PCE in samples collected northwest of this dry cleaner and on-Site. Based on records reviewed, we understand that soil removal, placement of a bioremediation product, and installation of a soil vapor extraction system will be performed. Remedial work will likely continue at this property in the future, which may require further subsurface exploration activities that may extend onto the Site. The proposed development in this area will be required to provide continued access for remedial activities and monitoring if those activities are continuing at the time of development. Structures on and near this dry cleaner likely will require vapor intrusion engineering controls. In addition, we recommend that an environmental professional periodically review available future correspondence related to the dry cleaner to help track the progress and status of remedial work.

10.9 REGULATORY AGENCY CONSIDERATIONS

Per the Water Board closure letter for the former Rent-A-Rack station, the Water Board indicated that the "*Contra Costa County Health Services Department, and the appropriate planning and building department should be notified prior to any changes in land use, grading activities, excavation, and installation of wells*". We recommend contracting these agencies to inform them of the proposed project and determine what, if any, site management requirements may be required.

The DTSC is currently overseeing the investigation and remediation activities at the Appian 80 Cleaners (1577 Tara Hills Drive). We recommend discussing the planned development with the DTSC before acquiring the parcel.

We recommend engaging with a regulatory oversight agency for the further evaluation of the VOCs detected near the former on-Site dry cleaner (1441 Tara Hills Drive). Additional reporting will be determined based on the agency involved and their requirements.

10.10 ENVIRONMENTAL ATTORNEY

We recommend consulting with an environmental attorney regarding liabilities associated with the impacts identified that appear associated with the former on-Site dry cleaner.

10.11 ASBESTOS CONTAINING BUILDING MATERIALS (ACBMS)

Due to the age of the on-Site structure(s), building materials may contain asbestos. For the buildings that will be demolished, an asbestos survey is required by local authorities and/or National Emissions Standards for Hazardous Air Pollutants (NESHAP) guidelines. NESHAP guidelines require the removal of potentially friable ACBMs prior to building demolition or renovation that may disturb the ACBM.

10.12 LEAD-BASED PAINT

The Consumer Product Safety Commission banned the use of lead as an additive in paint in 1978. Based on the age of the building, lead-based paint may be present. If demolition is planned, the removal of lead-based paint isn't required if it is bonded to the building materials. However, if the lead-based paint is flaking, peeling, or blistering, it should be removed prior to demolition. In either case, applicable OSHA regulations must be followed; these include requirements for worker training, air monitoring and dust control, among others. Any debris or soil containing lead must be disposed appropriately.

10.13 DATA GAPS

ASTM Standard Designation E 1527-13 requires the Environmental Professional to comment on significant data gaps that affect our ability to identify Recognized Environmental Conditions. A data gap is a lack of or inability to obtain information required by ASTM Standard Designation E 1527-13 despite good faith efforts by the Environmental Professional to gather such information. A data gap by itself is not inherently significant; it only becomes significant if it raises reasonable concerns. No significant data gaps were identified during preparation of this Phase I ESA.

10.14 DATA FAILURES

As described by ASTM Standard Designation E 1527-13, a data failure occurs when all of the standard historical sources that are reasonably ascertainable and likely to be useful have been reviewed and yet the historical research objectives have not been met. Data failures are not uncommon when attempting to identify the use of a Site at five year intervals back to the first use or to 1940 (whichever is earlier). ASTM Standard Designation E 1527-13 requires the Environmental Professional to comment on the significance of data failures and whether the data failure affects our ability to identify Recognized Environmental Conditions. A data failure by itself is not inherently significant; it only becomes significant if it raises reasonable concerns. No significant data failures were identified during this Phase I ESA.

10.15 RECOGNIZED ENVIRONMENTAL CONDITIONS

Cornerstone has performed a Phase I ESA in general conformance with the scope and limitations of ASTM E 1527-13 of 1201 to 1577 Tara Hills Drive, Pinole, California. This assessment identified the following Recognized Environmental Condition[1].

- A former dry cleaner (Four Mile Express Cleaners) is present on-Site. Soil vapor sampling conducted in conjunction with this Phase I ESA Update detected elevated chlorinated VOCs beneath and adjacent to the former dry cleaner. These detections suggest a past dry cleaning solvent release.

- A dry cleaner (Appian 80 Cleaners) is present at 1577 Tara Hills Drive that is currently undergoing investigation and remediation activities under DTSC oversight.

This assessment did not identify any Controlled Recognized Environmental Conditions[2]; the following Historical Recognized Environmental Condition were identified[3]:

- A Chevron-branded gasoline station was located at 1201 Tara Hills Drive from at least 1968 until 1997. The gasoline station had three 1,000-gallon gasoline USTs and one 1,000-gallon waste oil UST that were removed in 1997. Confirmation sampling

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[1] The presence or likely presence of hazardous substances or petroleum products on the Site: 1) due to significant release to the environment; 2) under conditions indicative of a significant release to the environment; or 3) under conditions that pose a material threat of a future significant release to the environment.

[2] A Recognized Environmental Condition that has been addressed to the satisfaction of the applicable regulatory agency with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls or restrictions.

[3] A past Recognized Environmental Condition has been addressed to the satisfaction of the applicable regulatory agency or meeting of unrestricted use criteria established by the applicable regulatory agency without subjecting the Site to required controls or restrictions.

conducted during removal did not indicate that a release had occurred and the County required no further action.

- A Rent-A-Rack-branded gasoline station was located at 1271 Tara Hills Drive until approximately 1986 when two 1,000-gallon gasoline USTs and one 500-gallon waste oil UST were removed. Sampling indicated isolated areas of gasoline-related soil impacts. Due to these isolated impacts, the Site was grated closure in 2014. Due to the change is Site use in the area of these former USTs, we recommend the collection of soil, soil vapor, and ground water grab samples to determine if special considerations will be required during building design and/or Site development.

SECTION 11: LIMITATIONS

Cornerstone performed this Phase I ESA to support Hillsboro Properties in evaluation of Recognized Environmental Conditions associated with the Site. Hillsboro Properties understands that no Phase I ESA can wholly eliminate uncertainty regarding the potential for Recognized Environmental Conditions to be present at the Site. This Phase I ESA is intended to reduce, but not eliminate, uncertainty regarding the potential for Recognized Environmental Conditions. Hillsboro Properties understands that the extent of information obtained is based on the reasonable limits of time and budgetary constraints.

Findings, opinions, conclusions and recommendations presented in this report are based on readily available information, conditions readily observed at the time of the Site visit, and/or information readily identified by the interviews and/or the records review process. Phase I ESAs are inherently limited because findings are developed based on information obtained from a non-intrusive Site evaluation. Cornerstone does not accept liability for deficiencies, errors, or misstatements that have resulted from inaccuracies in the publicly available information or from interviews of persons knowledgeable of Site use. In addition, publicly available information and field observations often cannot affirm the presence of Recognized Environmental Conditions; there is a possibility that such conditions exist. If a greater degree of confidence is desired, soil, ground water, soil vapor and/or air samples should be collected by Cornerstone and analyzed by a state-certified laboratory to establish a more reliable assessment of environmental conditions.

Cornerstone acquired an environmental database of selected publicly available information for the general area of the Site. Cornerstone cannot verify the accuracy or completeness of the database report, nor is Cornerstone obligated to identify mistakes or insufficiencies in the information provided (ASTM E 1527-13, Section 8.1.3). Due to inadequate address information, the environmental database may have mapped several facilities inaccurately or could not map the facilities. Releases from these facilities, if nearby, could impact the Site.

Hillsboro Properties may have provided Cornerstone environmental documents prepared by others. Hillsboro Properties understands that Cornerstone reviewed and relied on the information presented in these reports and cannot be responsible for their accuracy.

This report, an instrument of professional service, was prepared for the sole use of Hillsboro Properties and may not be reproduced or distributed without written authorization from Cornerstone. It is valid for 180 days. An electronic transmission of this report may also have been issued. While Cornerstone has taken precautions to produce a complete and secure electronic transmission, please check the electronic transmission against the hard copy version for conformity.

Cornerstone makes no warranty, expressed or implied, except that our services have been performed in accordance with the environmental principles generally accepted at this time and location.

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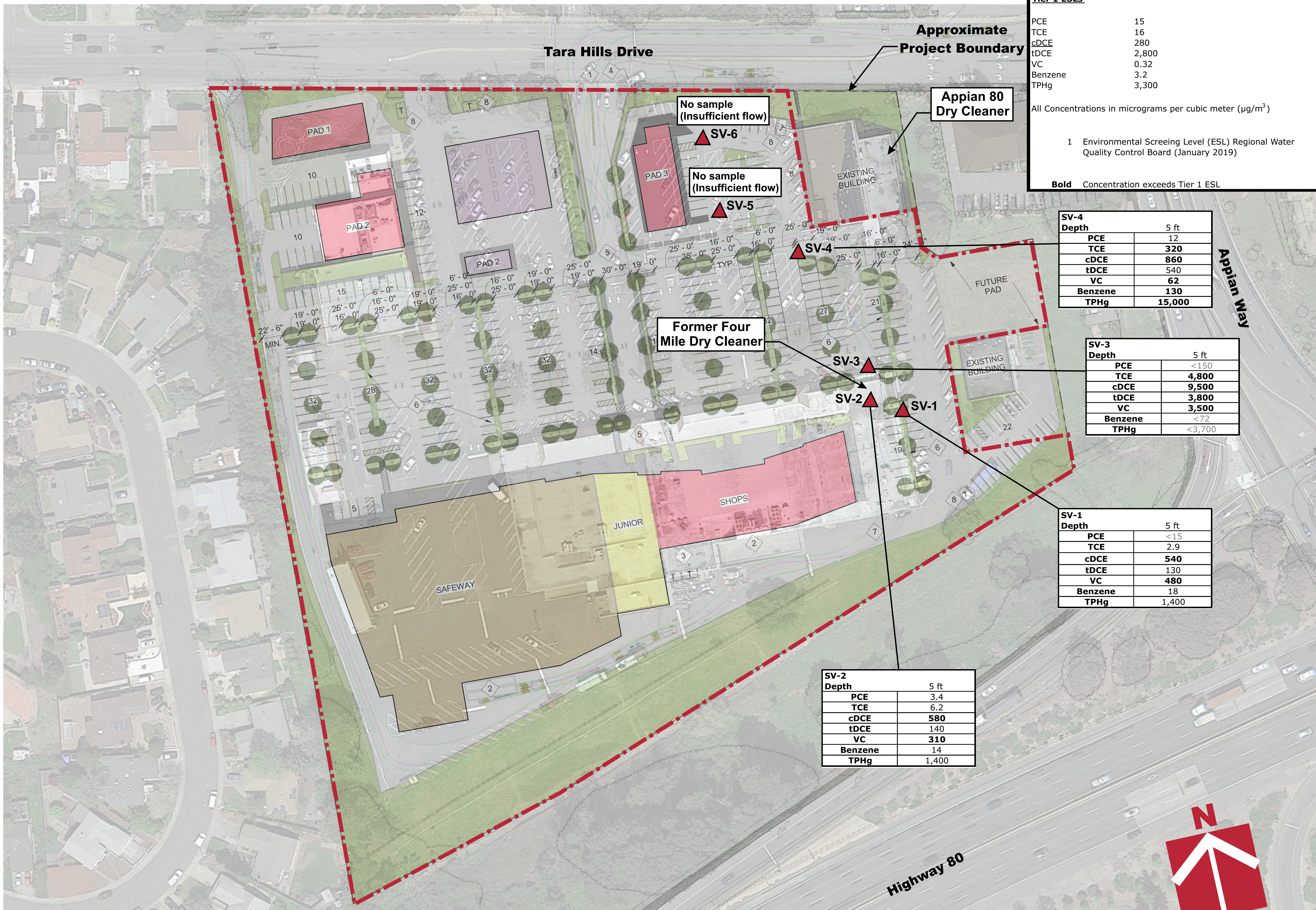
Vicinity Map	Project Number 856-1-4
Pinole Square Pinole, CA	Figure Number Figure 1
	Date: May 2019 / Drawn By: RRN



Tier 1 ESLs[1]

PCE	15
TCE	16
cDCE	280
tDCE	2,800
VC	0.32
Benzene	3.2
TPHg	3,300

All Concentrations in micrograms per cubic meter (μg/m^3)

1 Environmental Screeing Level (ESL) Regional Water Quality Control Board (January 2019)

Bold Concentration exceeds Tier 1 ESL

SV-4 Depth	5 ft
PCE	12
TCE	**320**
cDCE	**860**
tDCE	540
VC	**62**
Benzene	**130**
TPHg	**15,000**

SV-3 Depth	5 ft
PCE	<150
TCE	**4,800**
cDCE	**9,500**
tDCE	**3,800**
VC	**3,500**
Benzene	<72
TPHg	<3,700

SV-1 Depth	5 ft
PCE	<15
TCE	2.9
cDCE	**540**
tDCE	130
VC	**480**
Benzene	18
TPHg	1,400

SV-2 Depth	5 ft
PCE	3.4
TCE	6.2
cDCE	**580**
tDCE	140
VC	**310**
Benzene	14
TPHg	1,400

Legend

▲ Approximate location of soil vapor sample (SV)

0 100 200

APPROXIMATE SCALE (FEET)

Base by Google Earth, dated 4/2/2018
Overlay by Lowney Architecture, Site Plan - A1.1, 7/11/2016

Project Number 856-1-4

Figure Number Figure 2

Drawn By RRN

Date June 2019

Site Plan

Pinole Square
Pinole, CA

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Table 1. Analytical Results of Selected Soil Vapor Samples

(Concentrations in µg/m³)

Sample ID	Date	Depth (feet)	PCE	TCE	cDCE	tDCE	Vinyl Chloride	1,1 - DCE	Benzene	Toluene	Ethyl-benzene	m,p-Xylene	o-xylene
SV-1	5/28/2019	5	<15	2.9	**540***	130	**480**	9	**18***	7.5	<9.5	<9.5	<9.5
SV-2	5/28/2019	5	3.4	6.2	**580***	140	**310**	19	**14***	12	<9.3	5.4	<9.3
SV-3	5/28/2019	5	<150	**4,800**	**9,500**	**3,800***	**3,500**	690	<72	<85	<98	<98	<98
SV-4	5/28/2019	5	12	**320**	**860***	540	**62**	22	**130**	200	23	85	25
ESL[1] - Tier 1			15	16	280	2,800	0.32	2,400	3.2	10,000	37	3,500	3,500
ESL[1] - Commercial (Direct Exposure)			67	100	1,200	12,000	5.2	10,000	14	44,000	160	15,000	15,000

Sample ID	Date	Depth (feet)	1,2,4-TMB	1,3,5-TMB	2,2,4-Trimethyl-pentane	4-Ethyl Toluene	Acetone	Carbon Disulfide	Cyclo-hexane	Heptane	Hexane	Isopropanol	TPHg
SV-1	5/28/2019	5	<11	<11	<10	<11	29	<27	8.6	<8.9	16	<21	1,400
SV-2	5/28/2019	5	3.1	<10	2.8	2.3	<51	14	8.8	4	23	9.3	1,400
SV-3	5/28/2019	5	<110	<110	<100	<110	<210	<280	<77	<92	26	<220	<3700
SV-4	5/28/2019	5	14	5.9	7.9	18	35	270	6.5	5.5	7.2	<34	**15,000***
ESL[1] - Tier 1			NE	NE	NE	NE	1.0E+06	NE	NE	NE	NE	NE	3,300
ESL[1] - Commercial (Direct Exposure)			NE	NE	NE	NE	4.5E+06	NE	NE	NE	NE	NE	83,000

1 Environmental Screening Level (ESL), RWQCB, San Francisco Bay Region - January 2019

< Not detected at or above laboratory reporting limit

NE Not Established

--- Not Analyzed

BOLD Concentration exceeds selected environmental screening criteria

* Concentration exceeds Tier 1 ESL but is below the commercial direct exposure ESL

APPENDIX A – TERMS AND CONDITIONS

APPENDIX B – DATABASE SEARCH REPORT

APPENDIX C – SELECTED REGULATORY DOCUMENTS

APPENDIX D – HISTORIC AERIAL PHOTOGRAPHS AND TOPOGRAPHIC MAPS

APPENDIX E – LOCAL STREET DIRECTORY SEARCH RESULTS

APPENDIX F – QUESTIONNAIRE

APPENDIX E

ADDITIONAL SOIL, SOIL VAPOR, AND GROUNDWATER QUALITY EVALUATION

Date:	August 30, 2019
Project No.:	856-1-5
Prepared For:	Mr. Carl Goldstone Hillsboro Properties, Inc. 1300 S. El Camino Real, Suite 525 San Mateo, California 94402
Re:	Additional Soil, Soil Vapor and Groundwater Quality Evaluation Pinole Square 1211 to 1501 Tara Hills Drive Pinole, California

Dear Mr. Goldstone:

This letter summarizes the results of the additional soil, soil vapor, and groundwater quality evaluation performed at the Pinole Square Shopping Center. Cornerstone Earth Group (Cornerstone) performed this scope of work in accordance with our agreement dated July 2, 2019 (Agreement).

Project Background

The Pinole Square Shopping Center is located at 1211 to 1501 Tara Hills Drive in Pinole, California (Site, Figures 1 and 2). The existing Site is anchored by a Safeway grocery store and is surrounded by several smaller businesses located in outlying pads. We understand that Hillsboro Properties intends to renovate the Site, which includes enlarging the footprint to the west and construction of a fuel center.

The previous 2015 Phase I Environmental Site Assessment (ESA) and 2019 Phase I ESA Update prepared by Cornerstone identified two areas where underground storage tanks (USTs) were formerly located on-Site: former Chevron Station (1201 Tara Hills Drive) and the former Rent A Rack (1271 Tara Hills Drive). In addition, the reports identified an on-Site drycleaner located at 1441 Tara Hills Drive (Four Mile Cleaners) and an off-Site drycleaner located at 1577 Tara Hills Drive (Appian 80 Cleaners). The on-Site drycleaner is no longer in operation, but the off-Site drycleaner remains in operation. Information reviewed during preparation of the Phase I ESA and Phase I ESA Update reports indicate that this off-Site drycleaner has a documented tetrachloroethene (PCE) release and is currently performing cleanup activities under oversight by the California Department of Toxic Substance Control (DTSC).

In December 2015, Cornerstone advanced four borings to depths of approximately 10 feet at the former Rent-A-Rack. A petroleum odor and green discoloration were observed in all borings. Cornerstone attempted to collect soil vapor samples from these borings but was unsuccessful due to water intrusion from precipitation.

In August 2017, Cornerstone collected soil samples from four borings advanced near the former Rent-A-Rack UST at depths of up to approximately 10 feet. All compounds detected in these soil samples were below their respective commercial and construction worker ESLs[1]. The results of this sampling event were presented in the *Site Management Plan (SMP)* dated September 20, 2017.

On May 28, 2019, Cornerstone collected soil vapor samples from beneath and adjacent to the former on-Site drycleaner as well as near the property boundary adjacent to an off-Site drycleaner. Results from this event were included in the draft *Phase I Environmental Site Assessment Update and Preliminary Soil Vapor Quality Evaluation* dated June 27, 2019. Results from these samples detected elevated concentrations of the chlorinated volatile organic compounds (VOCs) trichloroethene (TCE), cis-1,2-dichloroethene (cDCE), trans-1,2,-dichloroethene (tDCE), and vinyl chloride adjacent to the former on-Site cleaner. These VOCs are degradation products of PCE, which is a dry-cleaning solvent. PCE was also detected in soil vapor samples but at concentration below the Tier 1 ESL. The highest chlorinated VOC concentrations detected were in the soil vapor sample collected SV-3, which was located adjacent and north of the former on-Site drycleaner. Elevated chlorinated VOC concentrations were also detected in the soil vapor samples collected from beneath the building slab within the former drycleaner unit, adjacent and to the east of the unit, and north of the drycleaner along the sewer lateral shared with the structure that contains the off-Site drycleaner. The soil vapor sampling locations are shown in Figure 2 and the previous results are included in Table 1.

Soil vapor concentrations of benzene and gasoline-range petroleum hydrocarbons (TPHg) exceeding the Tier 1 soil vapor ESL were also detected in the soil vapor samples collected the soil vapor samples collected in May 2019. Information reviewed by Cornerstone in preparation of the Phase I ESA and Phase I ESA Update, did not identify an on-site source in the northeastern area of the Site where these soil vapor samples were collected. However, a closed UST release is located adjacent and northeast of the Site (former Texaco-branded station, 1599 Tara Hills Drive). The Water Board reportedly closed this case in 2012 on the basis that the source had been removed, the contamination was properly characterized and contained, and the property was used for commercial purposes. At the time of closure, residual contamination appeared to remain beneath this property, which could be a source of the TPHg and benzene soil vapor detections on-Site.

Purpose

The purpose of this Scope of Work was to further evaluate the subsurface conditions near the former on-Site drycleaner by collecting soil vapor and groundwater samples. In addition, the purpose of this Scope of Work was to collect two soil vapor samples at the approximate location of the former Rent-A-Rack UST where previous soil vapor sampling was unsuccessful.

Subsurface Investigation

On July 25 and 26, 2019, Cornerstone directed a subsurface investigation and advanced 10 borings using a direct push drilling rig as described below:

- Former on-Site dry cleaner:
  - Four borings (SV-7, SV-8, SV-9, and SV-10) advanced to depths of approximately 5 feet for soil vapor sample collection

[1] Environmental Screening Levels (ESLs), California Regional Water Quality Control Board (Water Board), January 2019

    - Four borings (GW-1, GW-2, GW-3, and GW-4) advanced to approximately 22 ½ feet for groundwater sample collection. Groundwater sampling was unsuccessful at borings GW-1 and GW-2. Instead, a soil sample was collected from GW-2 (labeled SS-2).

- Former Rent A Rack USTs:
    - Two borings (SV-11 and SV-12) advanced to depths of approximately 5 feet at for soil vapor sample collection.

Soil vapor probes SV-7 through SV-10 were installed adjacent to the locations of sanitary sewer and stormwater sewer utilities as determined from maps provided by Hillsboro Properties and by field verification using a private utility locating contractor. The purpose of these soil vapor probes was to determine if the subsurface utilities could be acting as a preferential pathway for soil vapor migration and to further evaluate the extent of VOCs that previously detected in soil vapor. Groundwater samples were collected from GW-3 and GW-4, which were located adjacent to soil vapor probes SV-7 and SV-8, respectively, to determine if the soil vapor detections were due to groundwater impacts. The soil sample SS-2 (collected from the GW-2 boring) was located adjacent to former soil vapor probe SV-3, which contained the highest chlorinated VOC vapor concentrations detected during the May 2019 event. The soil sample was collected from a depth of approximately 15 to 15 ½ feet to help evaluate the presence of VOCs in the shallow groundwater zone; as noted above, an insufficient amount of groundwater was encountered in this boring to allow collection of a groundwater sample.

SUBSURFACE UTILITIES

As discussed, the borings near the former on-Site drycleaner were located along existing subsurface utilities to determine if a preferential pathway was present for soil vapor migration either to or from the Site. Specifically, the sanitary and stormwater sewers near the on-Site drycleaner were located for this evaluation, and their approximate locations are provided in Figure 2. Based on the provided utility plans, the sanitary sewer begins at 1577 Tara Hills Drive, which contains the off-Site drycleaner, flows south towards the on-Site drycleaner where it joins a larger sewer lateral that flows to the west and eventually turns to the north where it connects to the sanitary sewer main beneath Tara Hills Drive. The east-west oriented sanitary sewer lateral begins with the lateral connected to the restaurant adjacent and to the east of the Site. The on-Site drycleaner connects to this east-west lateral at the manhole located northeast of the on-Site drycleaner.

The stormwater sewer appears to flow from the parking lot south of 1577 Tara Hills Drive, diagonally towards Safeway where it turns to the west, and then eventually to the south where it discharges off-Site and south of the Site. Catch basins are located at various locations along the stormwater sewer.

SUBSURFACE MATERIALS

The subsurface materials observed in the exploratory borings generally consisted of sandy clay with some gravel. No apparent chemical odors were observed in the exploratory borings. Organic vapor meter (OVM) readings of up to 41.2 parts per million by vapor (ppmv) were detected in the soil samples retrieved from SV-12. No other OVM readings were recorded in the other borings. Our lithologic descriptions and OMV readings are included in the boring logs attached to this letter.

Groundwater was encountered at depths of approximately 15 feet and 20 feet in borings GW-3 and GW-4, respectively, but was not encountered in borings GW-1 and GW-2 advanced to depths of up to 17 feet. Limited access drilling equipment was required at GW-1 and GW-2 due to low clearance, and the subsurface conditions prevented this equipment from drilling deeper than approximately 17 feet.

SOIL QUALITY EVALUATION

One soil sample was collected at a depth of approximately 15 to 15 ½ feet at GW-2 and labeled SS-2(15 to 15.5). The sample was collected in three 5-gram Core-N-One capsules per DTSC guidance and analyzed for VOC (EPA Test Method 8260B). No VOCs were detected in this sample.

This soil sample was collected adjacent to the location of soil vapor probe SV-3 where the highest soil vapor concentrations were previously detected in May 2019. The SS-2 soil results indicate that there does not appear to be VOC impacts in soil at the depth where this sample was collected.

GROUND WATER QUALITY EVALUATION

Groundwater samples were collected from locations GW-3 and GW-4. GW-3 was located adjacent to soil vapor probe SV-7 along the sanitary sewer lateral, and GW-4 was located adjacent to SV-8 adjacent to the stormwater sewer. Groundwater samples were not collected from GW-1 and GW-2. The groundwater sampling locations are presented in Figure 2 and the laboratory report is attached to this letter.

Once groundwater was encountered, a section of slotted PVC was lowered into the exploratory boring to facilitate groundwater sample collection. The grab groundwater samples were collected using a peristaltic pump and clean (new) tubing. The samples were collected in clean laboratory-provided sampling containers, pre-preserved as appropriate. The two grab groundwater samples were analyzed for VOCs (EPA Test Method 8260B). No VOCs were detected in the two groundwater samples analyzed.

SOIL VAPOR EVALUATION

The six temporary soil vapor probes were installed to depths of approximately 4½ to 5 feet at each location. Each probe was completed with stainless steel expendable tip and screen affixed to stainless steel tubing. Each probe was constructed by first placing approximately ½ foot of coarse aquarium-type sand into the bottom of the boring. The stainless steel tip and tubing was then lowered into the boring via a tremie pipe. Additional sand was then placed in the boring via tremie when needed to create an approximately 1 foot sand pack interval around the vapor tip. Approximately 1 foot of granular bentonite was placed on top of the sand pack. Hydrated bentonite was then placed down the boring; the mixture consisted of approximately 50 percent water to bentonite and was placed in less than ½ foot lifts to just below the surface. The stainless steel tubing was labeled with depth of placement and capped utilizing a vapor-tight Swagelok valve set in the “off” position.

The temporary vapor probes were sampled on July 31, 2019, at least 5 days after installation. The DTSC guidance recommends sampling at least 2 hours after installation for soil vapor probes installed using direct push drilling. A 167 milliliters-per-minute flow regulator inclusive of a particulate filter was fitted to the shut-off valve and the other end to a “T” fitting. A Summa canister was connected to the "T" fitting. The other end of the "T" fitting was affixed to a digital vacuum gauge and a 1-liter Summa canister utilized for purging.

A minimum 10-minute vacuum tightness test was performed on the manifold and connections by opening and closing the 1-liter purge canister valve and applying and monitoring a vacuum on the vacuum gauge. The sample shut-off valve on the downhole side of the sampling manifold remained in the "off" position. When gauge vacuum was maintained for at least 10 minutes without any noticeable decrease (less than approximately 0.1 inches of mercury (Hg) for properly connected fittings), purging began. The downhole shut off valve was opened and approximately three purge volumes of vapor were removed using the purging 1-liter Summa. The volume of vapor removed was verified by the calculated versus observed pressure drop in the purging Summa canister. The purge volume was calculated based on the length and inner diameter of the sampling probe and the connected sampling tubing and equipment. Assuming the vapor probe was properly sealed, the borehole sand pack vapor space will have equilibrated with the surrounding vapors following the equilibration period. Thus, the sand pack vapor space was not included in the purge volume calculation.

Samples were successfully collected from temporary soil vapor probes SV-7 and SV-9 through SV-12. However, a soil vapor sample could not be collected from probe SV-8 due to the tight clay subsurface materials. Soil vapor sampling field notes and logs are attached to this letter.

Soil Vapor Laboratory Sampling and Analyses

Cornerstone collected soil vapor samples from temporary probes SV-7 and SV-9 through SV-12 in laboratory-provided cannisters and submitted the samples for analysis to a state-certified analytical laboratory under a chain of custody control. The five samples were analyzed for TPHg and VOCs (EPA Test Method TO-15). In addition, one air sample collected from the shroud atmosphere was analyzed for isopropyl alcohol.

Soil Vapor Analytical Summary

The detected soil vapor concentrations were compared to the Tier 1 ESLs. Detected compounds are presented in Table 1. Selected compounds are presented on Figure 2. Chain of custody documentation and laboratory analytical reports attached to this letter.

A summary of the analytical results is presented below separately for the former on-Site drycleaner and the former Rent-A-Rack UST location:

<u>Former On-Site Drycleaner:</u>

- PCE was detected at concentrations up to 220 micrograms per cubic meter (μg/m^3) and exceeded the Tier 1 ESL of 16 μg/m^3 in the three samples collected near the former drycleaner. The highest concentration was detected in the sample collected from SV-9, which was located northeast of the former on-Site drycleaner and adjacent to the east-west sewer lateral.

- TCE was detected at concentrations of 1,900 μg/m^3 in SV-9 and 110 μg/m^3 in SV-10, which both exceeded the Tier 1 ESL of 16 μg/m^3. TCE was not detected in SV-7; however, dilution of this sample necessary for the laboratory to analyze resulted in an increased reporting limit that is above the Tier 1 ESL. SV-10 was located north of the on-Site drycleaner and adjacent to the stormwater sewer. SV-7 was located along the E-W sewer lateral and northeast of the on-Site drycleaner.

- cDCE was detected in the soil vapor sample collected from SV-9 at a concentration of 580 µg/m^3, which exceeds the Tier 1 ESL of 280 µg/m^3. cDCE was detected below the Tier 1 ESL in the sample collected from SV-10 but was not detected in the sample collected from SV-7.

- Vinyl Chloride was detected at a concentration of 9.4 µg/m^3 in the sample collected from SV-9, which exceeds the Tier 1 ESL of 0.32 µg/m^3. Vinyl chloride was not detected in the samples collected from SV-7 or SV-10, although these reporting limits were raised due to required sample dilution by the laboratory.

- TPHg was detected at a concentration of 18,000 µg/m^3 at SV-7, which is above the Tier 1 ESL of 3,300 µg/m^3.

- Benzene was detected at concentrations exceeding the Tier 1 ESL of 3.2 µg/m^3 in the samples collected from SV-7 (50 µg/m^3) and SV-10 (6.1 µg/m^3).

<u>Former Rent-A-Rack UST</u>

- TPHg was detected at concentrations of 1,600,000 µg/m^3 and 110,000,000 µg/m^3 in the samples collected from SV-11 and SV-12, respectively. The Tier 1 ESL for TPHg is 3,300 µg/m^3.

- Soil vapor concentrations of benzene, ethylbenzene, and m,p-xylene exceeded their respective Tier 1 ESLs in the soil vapor sample collected from SV-12. These VOCs were not detected in the sample collected from SV-11; however, the sample dilution performed by the laboratory for this sample increased the reporting limits of these VOCs.

Conclusions

The results from the soil vapor probes installed along the sewer laterals near the former on-Site drycleaner confirm the presence of chlorinated VOCs in soil vapor and appear to indicate the higher concentrations are located near sewer laterals. The highest concentrations were detected along the east-west oriented lateral in front of and to the northwest of the former on-Site drycleaner, and in the lateral that carries wastewater from the off-Site property at 1577 Tara Hills Drive. Low to non-detect VOCs were detected at the soil vapor probe installed adjacent to the sewer later that carries wastewater from the restaurant east of the Site. VOCs were not detected in the soil and groundwater samples collected. Typically, VOCs are detected in soil and/or groundwater samples collected near a source area. The subsurface data collected to date indicates that significant VOC concentrations are present in soil vapor that appear to be migrating along subsurface utilities. However, the data does not clearly identify a source area or areas of these VOCs in soil vapor.

Benzene and TPHg were detected in the soil vapor samples collected near the former on-Site drycleaner. These samples were collected at least 475 feet from the former Rent-A-Rack UST location and at least 500 feet from the former Chevron Station located in the northwestern corner of the Site. No potential fuel-related on-Site sources were identified in the area near the former drycleaner; however, the property adjacent and to the northeast is a closed leaking UST case with residual impacts at the time of closure. These fuel-related impacts in the eastern portion of the Site could be related to residual fuel-related impacts at this off-Site property.

The soil vapor samples collected from the approximate location of the former Rent-A-Rack UST indicate elevated concentrations of fuel-related VOCs in soil vapor that are likely due to residual UST impacts. Previous sampling indicates these impacts are limited to the former UST area. As discussed in other reports, the fill material used to fill the excavation after UST removal may require excavation and recompaction for geotechnical purposes. Cornerstone prepared a *Site Management Plan* dated September 20, 2017 that provides protocols for handling this material during excavation. The fill material, along with other impacted soil encountered during excavation, could be removed and replaced with clean fill. Soil vapor sampling could be performed after removal of this material to determine the effect on soil vapor concentrations. Removal of the residual fuel impacts from the former UST area is expected to significantly lower these VOCs detected in soil vapor.

Due the potential of off-Site sources of the VOCs detected on-Site, we recommend discussing the results of this and previous evaluations with an environmental attorney to determine appropriate next steps.

Limitation

This letter, an instrument of professional service, was prepared for the sole use of Hillsboro Properties and may not be reproduced or distributed without written authorization from Cornerstone. The chemical data presented in this report may change over time and are only valid for this time and location. Hillsboro Properties understands that Cornerstone reviewed and relied on the information presented in these reports and cannot be responsible for their accuracy. Cornerstone makes no warranty, expressed or implied, except that our services have been performed in accordance with the environmental principles generally accepted at this time and location.

Closing

Should you have any questions regarding this letter, or if we may be of further service, please contact us at your convenience.

Sincerely,

Cornerstone Earth Group, Inc.

DRAFT

Christopher J. Heiny, P.G.
Principal Geologist

DRAFT

Peter M. Langtry, P.G., C.E.G.
Senior Principal Geologist

Table 1. Analytical Results of Selected Soil Vapor Samples

(Concentrations in µg/m³)

Sample ID	Date	Depth (feet)	TPHg	PCE	TCE	cDCE	tDCE	Vinyl Chloride	1,1 - DCE	Benzene	Toluene	Ethyl-benzene	m,p-Xylene	o-xylene	1,1,1-Trichloro-ethane	1,1-Dichloro-ethane	1,2,4-TMB	1,3,5-TMB
SV-1	5/28/2019	5	1,400	<15	2.9	**540***	130	**480**	9	**18**	7.5	<9.5	<9.5	<9.5	<12	<8.8	<11	<11
SV-2	5/28/2019	5	1,400	3.4	6.2	**580***	140	**310**	19	**14***	12	<9.3	5.4	<9.3	<12	<8.6	3.1	<10
SV-3	5/28/2019	5	<3,700	<150	**4,800**	**9,500**	**3,800***	**3,500**	690	<72	<85	<98	<98	<98	<120	<91	<110	<110
SV-4	5/28/2019	5	**15,000***	12	**320**	**860***	540	**62**	22	**130**	200	23	85	25	<19	<14	14	5.9
SV-7	7/31/2019	5	**18,000***	**36***	<27	<20	<20	<13	<20	**50**	110	26	78	26	<28	<20	35	<25
SV-9	7/31/2019	5	1,200	**220**	**1,900**	**580***	100	**9.4**	20	<3.9	8.3	<5.4	<5.4	<5.4	12	41	<6.1	<6.1
SV-10	7/31/2019	5	3,000	**52***	**110**	8.8	<4.8	<3.1	<4.8	**6.1***	7.8	<5.2	5.6	<5.2	<6.6	<4.9	<5.9	<5.9
SV-11	7/31/2019	5	**1,600,000**	<200	<160	<120	<120	<76	<120	<94	<110	<130	<130	<130	<160	<120	340	<140
SV-12	7/31/2019	5	**110,000,000**	<9,100	<7,200	<5,300	<5,300	<3,400	<5,300	**14,000**	<5,100	**470,000**	**16,000**	<5,800	<7,300	<5,400	<6,600	<6,600
ESL[1] - Tier 1			3,300	15	16	280	2,800	0.32	2,400	3.2	10,000	37	3,500	3,500	35,000	58	NE	NE
ESL[1] - Commercial (Direct Exposure)			83,000	67	100	1,200	12,000	5.2	10,000	14	44,000	160	15,000	15,000	150,000	2,600	NE	NE

Sample ID	Date	Depth (feet)	2,2,4-Trimethyl-pentane	4-Ethyl Toluene	Acetone	Carbon Disulfide	Cyclo-hexane	Heptane	Hexane	Isopro-panol	2-Butanone	2-Hexanone	Chloroform	Isopropyl-benzene	Ethanol	Freon 12	Propyl-benzene
SV-1	5/28/2019	5	<10	<11	29	<27	8.6	<8.9	16	<21	<26	<36	<11	<11	<16	<11	<11
SV-2	5/28/2019	5	2.8	2.3	<51	14	8.8	4	23	9.3	<25	<35	<10	<10	<16	<10	<10
SV-3	5/28/2019	5	<100	<110	<210	<280	<77	<92	26	<220	<260	<370	<110	<110	<170	<110	<110
SV-4	5/28/2019	5	7.9	18	35	270	6.5	5.5	7.2	<34	<40	<56	<17	<17	<26	<17	<17
SV-7	7/31/2019	5	35	37	250	130	61	150	330	<50	83	<83	31	<25	70	<25	<25
SV-9	7/31/2019	5	6.2	<6.1	<29	20	<4.2	5.4	5.5	<12	<14	<20	22	<6.1	14	34	<6.1
SV-10	7/31/2019	5	<5.6	<5.9	<29	<15	<4.2	12	46	<12	<14	<20	100	<5.9	13	<6.0	<5.9
SV-11	7/31/2019	5	63,000	230	480	<370	<100	17,000	4,500	<290	<350	<480	<140	<140	<220	<150	160
SV-12	7/31/2019	5	3,700,000	6,600	<13,000	<17,000	1,000,000	1,400,000	1,400,000	<13,000	<16,000	35,000	<6,600	64,000	<10,000	<6,600	160,000
ESL[1] - Tier 1			NE	NE	1.0E+06	NE	NE	NE	NE	NE	1.70E+05	NE	4.1	NE	NE	NE	NE
ESL[1] - Commercial (Direct Exposure)			NE	NE	4.5E+06	NE	NE	NE	NE	NE	7.30E+05	NE	18	NE	NE	NE	NE

1 Environmental Screening Level (ESL), RWQCB, San Francisco Bay Region - January 2019

< Not detected at or above laboratory reporting limit

NE Not Established

--- Not Analyzed

BOLD Concentration exceeds selected environmental screening criteria

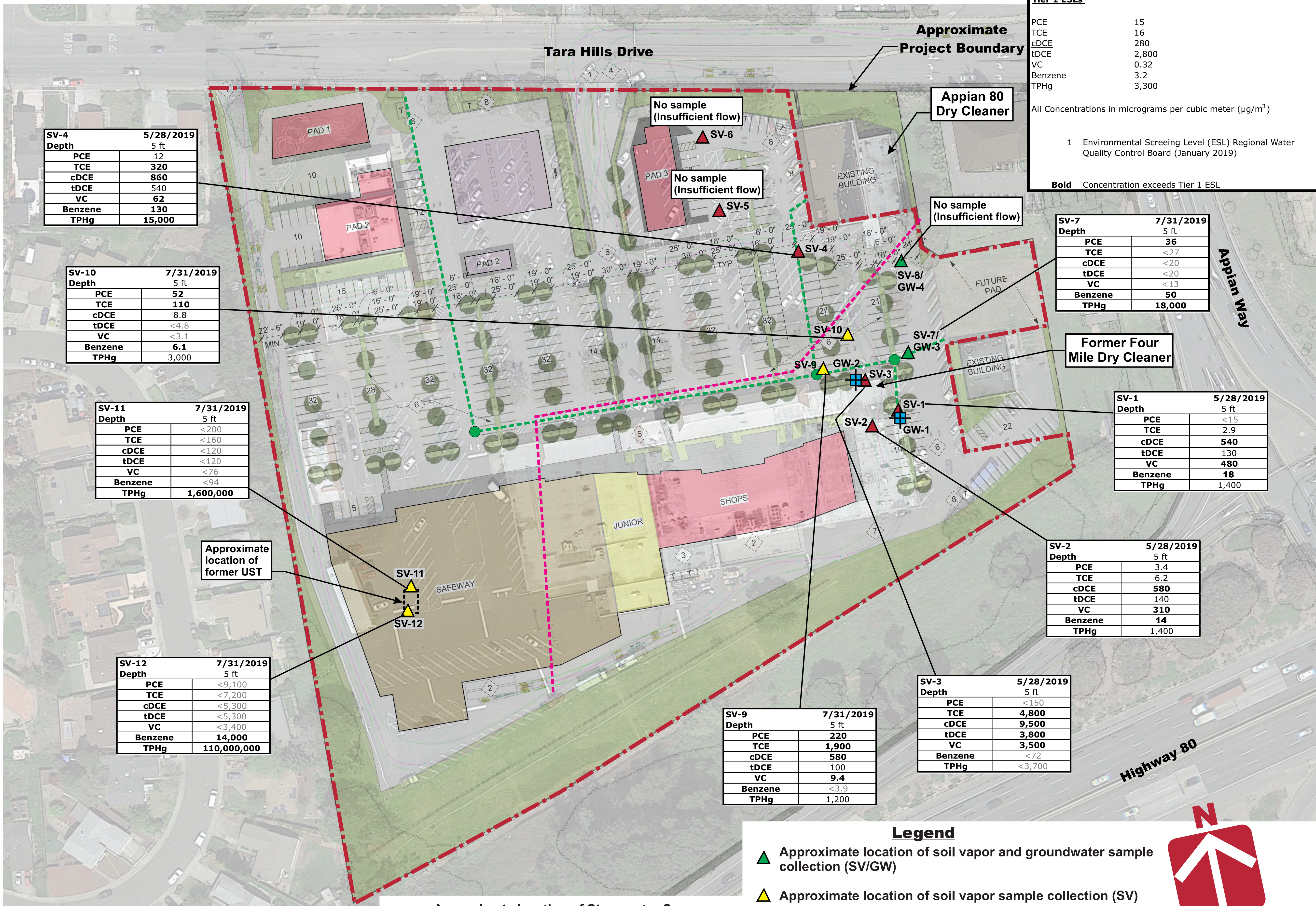
* Concentration exceeds Tier 1 ESL but is below the commercial direct exposure ESL

CORNERSTONE EARTH GROUP

Vicinity Map

Pinole Square
Pinole, CA

Project Number	856-1-5
Figure Number	Figure 1
Date	August 2019
Drawn By	RRN



SV-4	5/28/2019
Depth	5 ft
PCE	12
TCE	**320**
cDCE	**860**
tDCE	540
VC	**62**
Benzene	**130**
TPHg	**15,000**

SV-10	7/31/2019
Depth	5 ft
PCE	**52**
TCE	**110**
cDCE	8.8
tDCE	<4.8
VC	<3.1
Benzene	**6.1**
TPHg	3,000

SV-11	7/31/2019
Depth	5 ft
PCE	<200
TCE	<160
cDCE	<120
tDCE	<120
VC	<76
Benzene	<94
TPHg	**1,600,000**

SV-12	7/31/2019
Depth	5 ft
PCE	<9,100
TCE	<7,200
cDCE	<5,300
tDCE	<5,300
VC	<3,400
Benzene	**14,000**
TPHg	**110,000,000**

SV-7	7/31/2019
Depth	5 ft
PCE	**36**
TCE	<27
cDCE	<20
tDCE	<20
VC	<13
Benzene	**50**
TPHg	**18,000**

SV-1	5/28/2019
Depth	5 ft
PCE	<15
TCE	2.9
cDCE	**540**
tDCE	130
VC	**480**
Benzene	**18**
TPHg	1,400

SV-2	5/28/2019
Depth	5 ft
PCE	3.4
TCE	6.2
cDCE	**580**
tDCE	140
VC	**310**
Benzene	**14**
TPHg	1,400

SV-3	5/28/2019
Depth	5 ft
PCE	<150
TCE	**4,800**
cDCE	**9,500**
tDCE	**3,800**
VC	**3,500**
Benzene	<72
TPHg	<3,700

SV-9	7/31/2019
Depth	5 ft
PCE	**220**
TCE	**1,900**
cDCE	**580**
tDCE	100
VC	**9.4**
Benzene	<3.9
TPHg	1,200

Tier 1 ESLs[1]

PCE	15
TCE	16
cDCE	280
tDCE	2,800
VC	0.32
Benzene	3.2
TPHg	3,300

All Concentrations in micrograms per cubic meter (μg/m^3)

1 Environmental Screeing Level (ESL) Regional Water Quality Control Board (January 2019)

Bold Concentration exceeds Tier 1 ESL

Legend

- Approximate location of soil vapor and groundwater sample collection (SV/GW)
- Approximate location of soil vapor sample collection (SV)
- Approximate location of soil vapor sample (SV) (Cornerstone, June 2019)
- No groundwater reached during drilling
- Approximate location of Stormwater Sewer
- Approximate location of Sanitary Sewer
- Approximate location of Sanitary Sewer Manhole

0 100 200
APPROXIMATE SCALE (FEET)

Base by Google Earth, dated 4/2/2018
Overlay by Lowney Architecture, Site Plan - A1.1, 7/11/2016

Site Plan
Pinole Square
Pinole, CA

Project Number 856-1-5
Figure Number Figure 2
Drawn By RRN
Date August 2019

CORNERSTONE EARTH GROUP

BORING NUMBER GW-1

CORNERSTONE EARTH GROUP

PROJECT NAME Pinole Square Additional Drycleaner Investigation
PROJECT NUMBER 856-1-5
PROJECT LOCATION 1211 to 1501 Tara Hills Drive, Pinole, CA

DATE STARTED 7/26/19 **DATE COMPLETED** 7/26/19
DRILLING CONTRACTOR Penecore
DRILLING METHOD Direct Push
LOGGED BY NKM
NOTES

GROUND ELEVATION **BORING DEPTH** 17 ft.
LATITUDE **LONGITUDE**
GROUND WATER LEVELS:
AT TIME OF DRILLING Not Encountered
AT END OF DRILLING Not Encountered

This log is a part of a report by Cornerstone Earth Group, and should not be used as a stand-alone document. This description applies only to the location of the exploration at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with time. The description presented is a simplification of actual conditions encountered. Transitions between soil types may be gradual.

ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	Sample Type and Interval	Sample Submitted for Laboratory Analysis	Percent Recovery (%)	OVM Reading (ppm)	Odors or Discoloration	Notes
	0		**Sandy Lean Clay (CL)** moist, yellowish brown					0		
			color becomes greenish gray at 3'				72	0		
			Fat Clay (CH) moist, dark brown							
	5		**Sandy Lean Clay (CL)** moist, greenish brown				92	0		
			Fat Clay (CH) moist, dark brown				100	0		
	10									
			Sandy Lean Clay (CL) moist, greenish gray, fine sand				97	0		
			Sandy Lean Clay (CL) moist, yellowish brown, fine sand							
	15						89	0		
			Bottom of Boring at 17.0 feet.							
	20									

BORING NUMBER GW-2

CORNERSTONE EARTH GROUP

PROJECT NAME Pinole Square Additional Drycleaner Investigation
PROJECT NUMBER 856-1-5
PROJECT LOCATION 1211 to 1501 Tara Hills Drive, Pinole, CA

DATE STARTED 7/26/19 **DATE COMPLETED** 7/26/19
DRILLING CONTRACTOR Penecore
DRILLING METHOD Direct Push
LOGGED BY NKM
NOTES

GROUND ELEVATION **BORING DEPTH** 15.5 ft.
LATITUDE **LONGITUDE**
GROUND WATER LEVELS:
▽ **AT TIME OF DRILLING** Not Encountered
▼ **AT END OF DRILLING** Not Encountered

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ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	Sample Type and Interval	Sample Submitted for Laboratory Analysis	Percent Recovery (%)	OVM Reading (ppm)	Odors or Discoloration	Notes
	0		**Sandy Lean Clay (CL)** moist, yellowish brown, fine sand					0		
			Sandy Lean Clay (CL) moist, green with dark brown mottles							
			color becomes yellowish brown at 4'				97	0		
	5		**Sandy Lean Clay (CL)** moist, yellowish brown							
			Sandy Lean Clay (CL) moist, greenish brown				100	0		
	10		**Fat Clay (CH)** moist, dark brown					0		
	15		Bottom of Boring at 15.5 feet.							
	20									

BORING NUMBER GW-3

CORNERSTONE EARTH GROUP

PROJECT NAME Pinole Square Additional Drycleaner Investigation
PROJECT NUMBER 856-1-5
PROJECT LOCATION 1211 to 1501 Tara Hills Drive, Pinole, CA

DATE STARTED 7/25/19 **DATE COMPLETED** 7/25/19
GROUND ELEVATION **BORING DEPTH** 15 ft.
DRILLING CONTRACTOR Penecore
LATITUDE **LONGITUDE**
DRILLING METHOD Direct Push
GROUND WATER LEVELS:
LOGGED BY NKM
▽ **AT TIME OF DRILLING** 13 ft.
NOTES
▼ **AT END OF DRILLING** Not Encountered

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ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	Sample Type and Interval	Sample Submitted for Laboratory Analysis	Percent Recovery (%)	OVM Reading (ppm)	Odors or Discoloration	Notes
	0		3 inches asphalt concrete over 3 inches aggregate base							
			Sandy Lean Clay with Gravel (CL) moist, brown, fine sand, fine subangular gravel				47	0		
	5									
			Lean Clay (CL) moist, brown				55	0		
	10									
			becomes wet, fine sand at 12.5'				83	0		
	15		Bottom of Boring at 15.0 feet.							
	20									

BORING NUMBER GW-3 (NEW)

CORNERSTONE EARTH GROUP

PROJECT NAME Pinole Square Additional Drycleaner Investigation

PROJECT NUMBER 856-1-5

PROJECT LOCATION 1211 to 1501 Tara Hills Drive, Pinole, CA

DATE STARTED 7/25/19 **DATE COMPLETED** 7/25/19

GROUND ELEVATION ____ **BORING DEPTH** 17.5 ft.

DRILLING CONTRACTOR Penecore

LATITUDE ____ **LONGITUDE** ____

DRILLING METHOD Direct Push

GROUND WATER LEVELS:

LOGGED BY NKM

▽ **AT TIME OF DRILLING** 15 ft.

NOTES ____

▼ **AT END OF DRILLING** Not Encountered

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ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	Sample Type and Interval	Sample Submitted for Laboratory Analysis	Percent Recovery (%)	OVM Reading (ppm)	Odors or Discoloration	Notes
	0		3 inches asphalt concrete							
			Sandy Lean Clay with Gravel (CL) fine sand, fine subrounded gravel							
			Fat Clay (CH) moist, dark brown				100			
	5						70			
			Lean Clay (CL) moist, brown							
	10						77			
			Poorly Graded Sand (SP) moist, brown, fine sand							
	▽ 15		becomes wet at 15'							
			Bottom of Boring at 17.5 feet.							
	20									

BORING NUMBER GW-4

CORNERSTONE EARTH GROUP

PROJECT NAME Pinole Square Additional Drycleaner Investigation
PROJECT NUMBER 856-1-5
PROJECT LOCATION 1211 to 1501 Tara Hills Drive, Pinole, CA

DATE STARTED 7/25/19 **DATE COMPLETED** 7/25/19
GROUND ELEVATION **BORING DEPTH** 22.5 ft.
DRILLING CONTRACTOR Penecore
LATITUDE **LONGITUDE**
DRILLING METHOD Direct Push
GROUND WATER LEVELS:
LOGGED BY NKM
▽ **AT TIME OF DRILLING** 20.5 ft.
NOTES
▼ **AT END OF DRILLING** Not Encountered

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ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	N-Value (uncorrected) blows per foot	Sample Type and Interval	Sample Submitted for Laboratory Analysis	Percent Recovery (%)	OVM Reading (ppm)	Odors or Discoloration	Notes
	0	3 inches asphalt concrete							
		Fat Clay (CH) moist, dark brown							
		Lean Clay with Sand (CL) moist, brown, fine sand				93	0		
	5	**Poorly Graded Sand (SP)** brown, fine sand							
		Lean Clay with Sand (CL) moist, orange and brown mottling, fine sand				97	0		
	10	**Fat Clay (CH)** wet				100	0		
	15	**Lean Clay with Sand (CL)** moist, gray				100	0		
	20	**Clayey Sand (SC)** wet, gray							
		Bottom of Boring at 22.5 feet.							

BORING NUMBER SV-7

CORNERSTONE EARTH GROUP

PROJECT NAME Pinole Square Additional Drycleaner Investigation
PROJECT NUMBER 856-1-5
PROJECT LOCATION 1211 to 1501 Tara Hills Drive, Pinole, CA
DATE STARTED 7/25/19 **DATE COMPLETED** 7/25/19
GROUND ELEVATION **BORING DEPTH** 5.5 ft.
DRILLING CONTRACTOR Penecore
LATITUDE **LONGITUDE**
DRILLING METHOD Direct Push
GROUND WATER LEVELS:
LOGGED BY NKM
AT TIME OF DRILLING Not Encountered
NOTES
AT END OF DRILLING Not Encountered

This log is a part of a report by Cornerstone Earth Group, and should not be used as a stand-alone document. This description applies only to the location of the exploration at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with time. The description presented is a simplification of actual conditions encountered. Transitions between soil types may be gradual.

ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	Sample Type and Interval	Sample Submitted for Laboratory Analysis	Percent Recovery (%)	OVM Reading (ppm)	Odors or Discoloration	Notes
	0		2 inches asphalt concrete							
			Sandy Lean Clay with Gravel (CL) moist, dark brown, fine sand, fine subrounded gravel				55	0		
			becomes wet, dark brown							
	5									
			Bottom of Boring at 5.5 feet.							
	10									
	15									
	20									

CORNERSTONE GE LOG DEC192007 - CORNERSTONE 0812.GDT - 7/29/19 14:16 - P:\DRAFTING\GINT FILES\856-1-5 PINOLE SQUARE GE.GPJ

BORING NUMBER SV-9

CORNERSTONE EARTH GROUP

PROJECT NAME Pinole Square Additional Drycleaner Investigation
PROJECT NUMBER 856-1-5
PROJECT LOCATION 1211 to 1501 Tara Hills Drive, Pinole, CA

DATE STARTED 7/26/19 **DATE COMPLETED** 7/26/19
GROUND ELEVATION **BORING DEPTH** 5.5 ft.
DRILLING CONTRACTOR Penecore
LATITUDE **LONGITUDE**
DRILLING METHOD Direct Push
GROUND WATER LEVELS:
LOGGED BY NKM
AT TIME OF DRILLING Not Encountered
NOTES
AT END OF DRILLING Not Encountered

This log is a part of a report by Cornerstone Earth Group, and should not be used as a stand-alone document. This description applies only to the location of the exploration at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with time. The description presented is a simplification of actual conditions encountered. Transitions between soil types may be gradual.

ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	Sample Type and Interval	Sample Submitted for Laboratory Analysis	Percent Recovery (%)	OVM Reading (ppm)	Odors or Discoloration	Notes
	0		**Lean Clay with Gravel (CL)** moist, brown, fine gravel color becomes greenish gray at 1.5'							
			Sandy Lean Clay (CL) moist, yellowish brown, some gravel				70	0		
	5									
			Bottom of Boring at 5.5 feet.							
	10									
	15									
	20									

BORING NUMBER SV-10

CORNERSTONE EARTH GROUP

PROJECT NAME Pinole Square Additional Drycleaner Investigation
PROJECT NUMBER 856-1-5
PROJECT LOCATION 1211 to 1501 Tara Hills Drive, Pinole, CA

DATE STARTED 7/25/19 **DATE COMPLETED** 7/25/19
GROUND ELEVATION **BORING DEPTH** 5.5 ft.
DRILLING CONTRACTOR Penecore
LATITUDE **LONGITUDE**
DRILLING METHOD Direct Push
GROUND WATER LEVELS:
LOGGED BY NKM
AT TIME OF DRILLING Not Encountered
NOTES
AT END OF DRILLING Not Encountered

This log is a part of a report by Cornerstone Earth Group, and should not be used as a stand-alone document. This description applies only to the location of the exploration at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with time. The description presented is a simplification of actual conditions encountered. Transitions between soil types may be gradual.

ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	Sample Type and Interval	Sample Submitted for Laboratory Analysis	Percent Recovery (%)	OVM Reading (ppm)	Odors or Discoloration	Notes
	0		**Sandy Lean Clay with Gravel (CL)** moist, brown, fine subrounded gravel				31			
	5									
			Bottom of Boring at 5.5 feet.							
	10									
	15									
	20									

CORNERSTONE GE LOG DEC192007 - CORNERSTONE 0812.GDT - 7/29/19 14:16 - P:\DRAFTING\GINT FILES\856-1-5 PINOLE SQUARE GE.GPJ

BORING NUMBER SV-11

CORNERSTONE EARTH GROUP

PROJECT NAME Pinole Square Additional Drycleaner Investigation
PROJECT NUMBER 856-1-5
PROJECT LOCATION 1211 to 1501 Tara Hills Drive, Pinole, CA

DATE STARTED 7/26/19 **DATE COMPLETED** 7/26/19
GROUND ELEVATION **BORING DEPTH** 5.5 ft.
DRILLING CONTRACTOR Penecore
LATITUDE **LONGITUDE**
DRILLING METHOD Direct Push
GROUND WATER LEVELS:
LOGGED BY NKM
AT TIME OF DRILLING Not Encountered
NOTES
AT END OF DRILLING Not Encountered

This log is a part of a report by Cornerstone Earth Group, and should not be used as a stand-alone document. This description applies only to the location of the exploration at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with time. The description presented is a simplification of actual conditions encountered. Transitions between soil types may be gradual.

ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	Sample Type and Interval	Sample Submitted for Laboratory Analysis	Percent Recovery (%)	OVM Reading (ppm)	Odors or Discoloration	Notes
	0	CL	**Lean Clay with Sand (CL)** moist, yellowish brown							
			color becomes greenish at 1.5'							
			color becomes yellowish brown at 3'				77	0		
			color becomes greenish gray at 4'							
	5									
			Bottom of Boring at 5.5 feet.							
	10									
	15									
	20									

CORNERSTONE GE LOG DEC192007 - CORNERSTONE 0812.GDT - 7/29/19 14:16 - P:\DRAFTING\GINT FILES\856-1-5 PINOLE SQUARE GE.GPJ

BORING NUMBER SV-12

CORNERSTONE EARTH GROUP

PROJECT NAME Pinole Square Additional Drycleaner Investigation
PROJECT NUMBER 856-1-5
PROJECT LOCATION 1211 to 1501 Tara Hills Drive, Pinole, CA

DATE STARTED 7/26/19 **DATE COMPLETED** 7/26/19
GROUND ELEVATION **BORING DEPTH** 5.5 ft.
DRILLING CONTRACTOR Penecore
LATITUDE **LONGITUDE**
DRILLING METHOD Direct Push
GROUND WATER LEVELS:
LOGGED BY NKM
▽ **AT TIME OF DRILLING** Not Encountered
NOTES
▼ **AT END OF DRILLING** Not Encountered

This log is a part of a report by Cornerstone Earth Group, and should not be used as a stand-alone document. This description applies only to the location of the exploration at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with time. The description presented is a simplification of actual conditions encountered. Transitions between soil types may be gradual.

ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	Sample Type and Interval	Sample Submitted for Laboratory Analysis	Percent Recovery (%)	OVM Reading (ppm)	Odors or Discoloration	Notes
	0		**Lean Clay with Sand (CL)** moist, yellowish brown					41.2		
			Sandy Lean Clay with Gravel (CL) moist, greenish gray				85	40.7		
								3.0		
	5		Bottom of Boring at 5.5 feet.							
	10									
	15									
	20									

APPENDIX F

ENVIRONMENTAL NOISE AND VIBRATION ASSESSMENT

Environmental Noise & Vibration Assessment

Pinole Square Redevelopment Project – Phases 1-3

Pinole, California

BAC Job # 2019-120

Prepared For:

Raney Planning & Management, Inc.

Attn: Angela DaRosa
1501 Sports Drive, Suite A
Sacramento, CA 95834

Prepared By:

Bollard Acoustical Consultants, Inc.

Dario Gotchet

Dario Gotchet, Consultant

January 13, 2020

BOLLARD
Acoustical Consultants

CEQA Checklist

NOISE AND VIBRATION – **Would the Project Result in:**	**NA – Not Applicable**	**Potentially Significant Impact**	**Less than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Generation of substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			**X**		
b) Generation of excessive groundborne vibration or groundborne noise levels?				**X**	
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?					**X**

Introduction

The proposed Pinole Square Redevelopment Phases 1-3 (project) is located west of Appian Way, in between Tara Hills Drive and Interstate 80 in Pinole, California. Existing land uses in the project vicinity include residential to the west, and commercial to the north and east. The project site is bordered by Interstate 80 to the south. The project area and site illustrative plan are shown on Figures 1 and 2, respectively.

The first phase of the project would involve the demolition of an existing CVS Pharmacy store, and the construction of a gas station and retail center in the northwest corner of the parcel. The second phase would include the demolition of an existing Safeway supermarket and the development of additional retail centers. The third and final phase would involve the partial demolition of an existing retail center at the northwest corner of the parcel and the construction of two restaurant pads, one of which would include drive-through services.

The purposes of this analysis are to quantify the existing noise and vibration environments, identify potential noise and vibration impacts resulting from the project, identify appropriate mitigation measures, and provide a quantitative and qualitative analysis of impacts associated with the project. Specifically, impacts are identified if project-related activities would cause a substantial increase in ambient noise or vibration levels at existing noise-sensitive uses in the project vicinity. An impact would also be identified if project-generated noise or vibration levels would exceed applicable City of Pinole standards at existing noise-sensitive uses in the project vicinity.

Noise and Vibration Fundamentals

Noise

Noise is often described as unwanted sound. Sound is defined as any pressure variation in air that the human ear can detect. If the pressure variations occur frequently enough (at least 20 times per second), they can be heard and are designated as sound. The number of pressure variations per second is called the frequency of sound and is expressed as cycles per second, or Hertz (Hz). Definitions of acoustical terminology are provided in Appendix A.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals of pressure) as a point of reference, defined as 0 dB. Other sound pressures are then compared to the reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB. Another useful aspect of the decibel scale is that changes in decibel levels correspond closely to human perception of relative loudness. Noise levels associated with common noise sources are provided in Figure 3.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable and can be approximated by filtering the frequency response of a sound level meter by means of the standardized A-weighting network. There is a strong correlation between A-weighted sound levels (expressed as dBA) and community response to noise. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (L_{eq}). The L_{eq} is the foundation of the day/night average noise descriptor, L_{dn}, and shows very good correlation with community response to noise.

The day/night average sound level (L_{dn}) is based on the average noise level over a 24-hour day, with a +10 decibel weighting applied to noise occurring during nighttime (10:00 PM to 7:00 AM) hours. The nighttime penalty is based on the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, it tends to disguise short-term variations in the noise environment. For this reason, the City of Pinole utilizes performance standards for non-transportation noise sources.

Vibration

Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that noise is generally considered to be pressure waves transmitted through air, while vibration is usually associated with transmission through the ground or structures. As with noise, vibration consists of an amplitude and frequency. A person’s response to vibration will depend on their individual sensitivity as well as the amplitude and frequency of the source.

Vibration can be described in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration in terms of velocity in inches per second peak particle velocity (IPS, PPV) or root-mean-square (VdB, RMS). Standards pertaining to perception as well as damage to structures have been developed for vibration in terms of peak particle velocity as well as RMS velocities.

As vibrations travel outward from the source, they excite the particles of rock and soil through which they pass and cause them to oscillate. Differences in subsurface geologic conditions and distance from the source of vibration will result in different vibration levels characterized by different frequencies and intensities. In all cases, vibration amplitudes will decrease with increasing distance. The maximum rate, or velocity of particle movement, is the commonly accepted descriptor of the vibration “strength”.

Human response to vibration is difficult to quantify. Vibration can be felt or heard well below the levels that produce any damage to structures. The duration of the event has an effect on human response, as does frequency. Generally, as the duration and vibration frequency increase, the potential for adverse human response increases.

According to the Transportation and Construction-Induced Vibration Guidance Manual (Caltrans, June 2004), operation of construction equipment and construction techniques generate ground vibration. Traffic traveling on roadways can also be a source of such vibration. At high enough amplitudes, ground vibration has the potential to damage structures and/or cause cosmetic damage. Ground vibration can also be a source of annoyance to individuals who live or work close to vibration-generating activities. However, traffic, rarely generates vibration amplitudes high enough to cause structural or cosmetic damage.

Legend

Project Area (Approximate)

Short-Term Noise & Vibration Survey Locations

N

Scale (Feet)

0 125 250

Pinole Square Redevelopment
Phases 1-3
Pinole, California

Project Area

Figure 1

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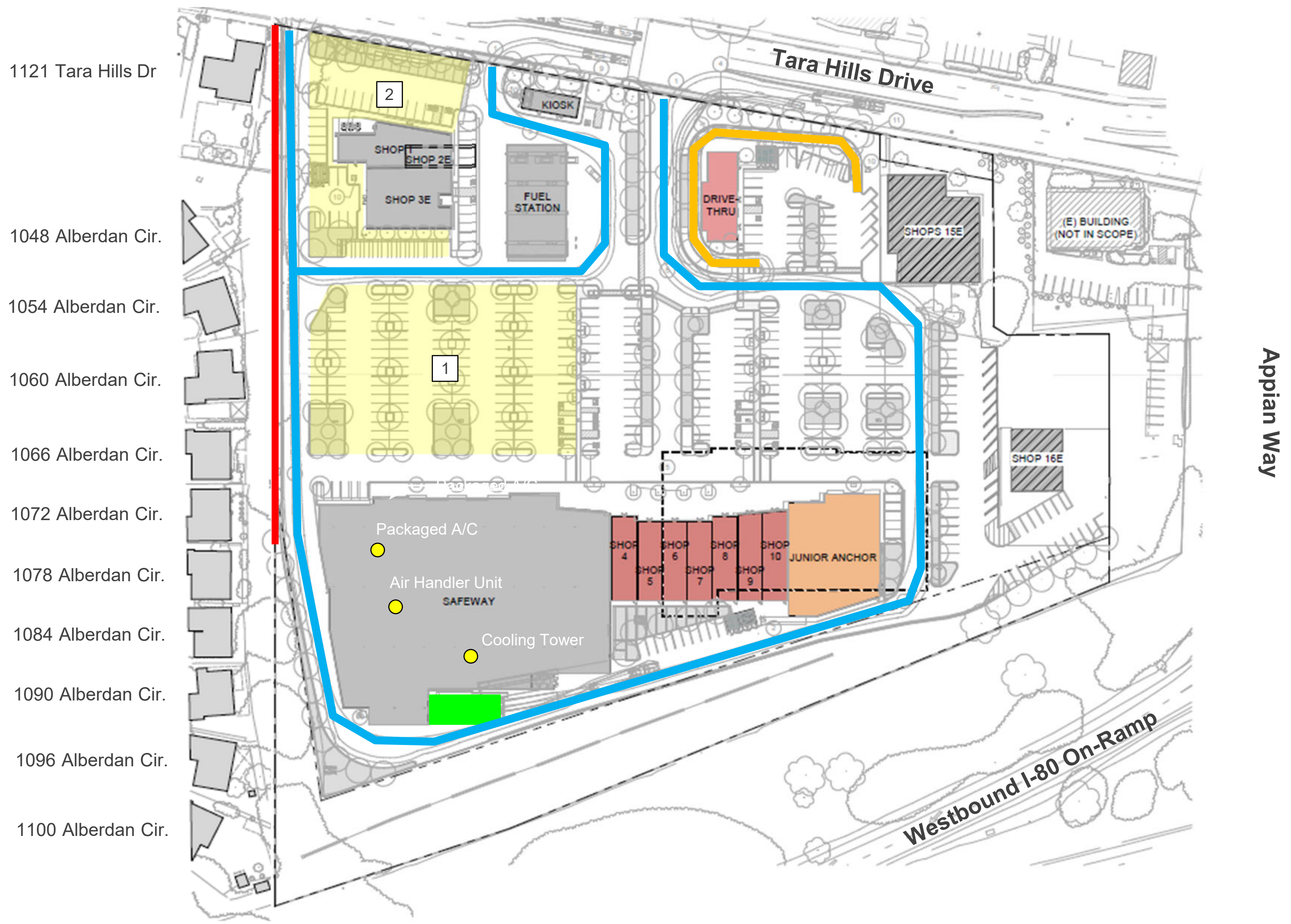
Acoustical Consultants



Legend

- Proposed On-Site Delivery Truck Circulation Route
- Proposed Restaurant Drive-Through Lane
- Proposed Parking Areas (Nearest to Residences)
- Proposed Loading Dock Area
- Recommended 7-Foot Tall Property Line Noise Barrier

Barrier Notes:
-Barrier Length: Approximately 525' in length
-Start Point: Northeast corner of 1121 Tara Hills Drive property
-End Point: Southeast corner 1072 Alberdan Circle property

N

Scale (Feet)
0 50 100

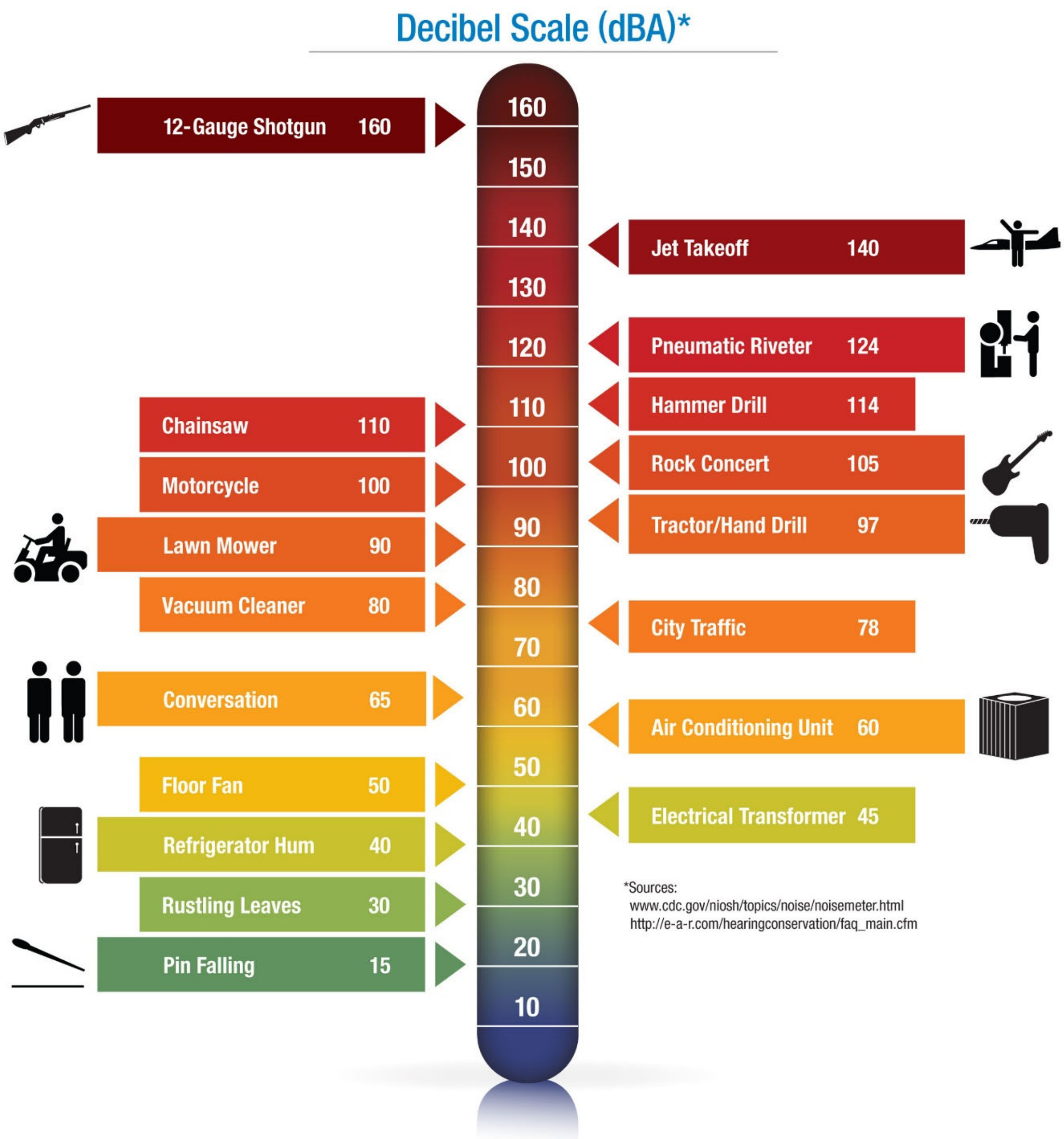
Pinole Square Redevelopment
Phases 1-3
Pinole, California

Project Site Plan

Figure 2

BOLLARD
Acoustical Consultants

Figure 3
Noise Levels Associated with Common Noise Sources



Regulatory Setting: Criteria for Acceptable Noise and Vibration Exposure

Federal

There are no federal noise or vibration criteria which would be directly applicable to this project. However, the City of Pinole does not currently have a policy for assessing noise impacts associated with increases in ambient noise levels from project-generated noise sources. As a result, the following federal noise criteria was applied to the project.

Federal Interagency Commission on Noise (FICON)

The Federal Interagency Commission on Noise (FICON) has developed a graduated scale for use in the assessment of project-related noise level increases. The criteria shown in Table 1 was developed by FICON as a means of developing thresholds for impact identification for project-related noise level increases. The FICON standards have been used extensively in recent years by the authors of this section in the preparation of the noise sections of Environmental Impact Reports that have been certified in many California cities and counties.

The use of the FICON standards are considered conservative relative to thresholds used by other agencies in the State of California. For example, the California Department of Transportation (Caltrans) requires a project-related traffic noise level increase of 12 dB for a finding of significance, and the California Energy Commission (CEC) considers project-related noise level increases between 5 to 10 dB significant, depending on local factors. Therefore, the use of the FICON standards, which set the threshold for finding of significant noise impacts as low as 1.5 dB, provides a very conservative approach to impact assessment for this project.

Table 1
Significance of Changes in Cumulative Noise Exposure

Ambient Noise Level Without Project (L_{dn} or CNEL)	Change in Ambient Noise Level Due to Project
<60 dB	+5.0 dB or more
60 to 65 dB	+3.0 dB or more
>65 dB	+1.5 dB or more
Source: Federal Interagency Committee on Noise (FICON)	

Based on the FICON research, as shown in Table 1, a 5 dB increase in noise levels due to a project is required for a finding of significant noise impact where ambient noise levels without the project are less than 60 dB. Where pre-project ambient conditions are between 60 and 65 dB, a 3 dB increase is applied as the standard of significance. Finally, in areas already exposed to higher noise levels, specifically pre-project noise levels in excess of 65 dB, a 1.5 dB increase is considered by FICON as the threshold of significance.

State of California

<u>California Environmental Quality Act (CEQA)</u>

The State of California has established regulatory criteria that are applicable to this assessment. Specifically, Appendix G of the State of California Environmental Quality Act (CEQA) Guidelines are used to assess the potential significance of impacts pursuant to local General Plan policies, Municipal Code standards, or the applicable standards of other agencies. According to Appendix G of the CEQA guidelines, the project would result in a significant noise or vibration impact if the following occur:

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

B. Generation of excessive groundborne vibration or groundborne noise levels?

C. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

It should be noted that audibility is not a test of significance according to CEQA. If this were the case, any project which added any audible amount of noise to the environment would be considered significant according to CEQA. Because every physical process creates noise, the use of audibility alone as significance criteria would be unworkable. CEQA requires a substantial increase in noise levels before noise impacts are identified, not simply an audible change.

<u>California Department of Transportation (Caltrans)</u>

The City of Pinole does not currently have adopted standards for groundborne vibration. As a result, the vibration impact criteria developed by the California Department of Transportation (Caltrans) was applied to the project. The Caltrans criteria applicable to damage and annoyance from transient and continuous vibration typically associated with construction activities are presented in Tables 2 and 3. Equipment or activities typical of continuous vibration include: excavation equipment, static compaction equipment, tracked vehicles, traffic on a highway, vibratory pile drivers, pile-extraction equipment, and vibratory compaction equipment. Equipment or activities typical of single-impact (transient) or low-rate repeated impact vibration include: impact pile drivers, blasting, drop balls, “pogo stick” compactors, and crack-and-seat equipment (California Department of Transportation 2013).

Table 2
Guideline Vibration Damage Potential Threshold Criteria

Structure and Condition	Maximum PPV (inches/second)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.20	0.10
Historic and some old buildings	0.50	0.25
Older residential structures	0.50	0.30
New residential structures	1.00	0.50
Modern industrial/commercial buildings	2.00	0.50

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

PPV = Peak Particle Velocity

Source: California Department of Transportation, Transportation and Construction Vibration Guidance Manual (2013).

Table 3
Guideline Vibration Annoyance Potential Criteria

Human Response	Maximum PPV (inches/second)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely perceptible	0.40	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.90	0.10
Severe	2.00	0.40

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

PPV = Peak Particle Velocity

Source: California Department of Transportation, Transportation and Construction Vibration Guidance Manual (2013).

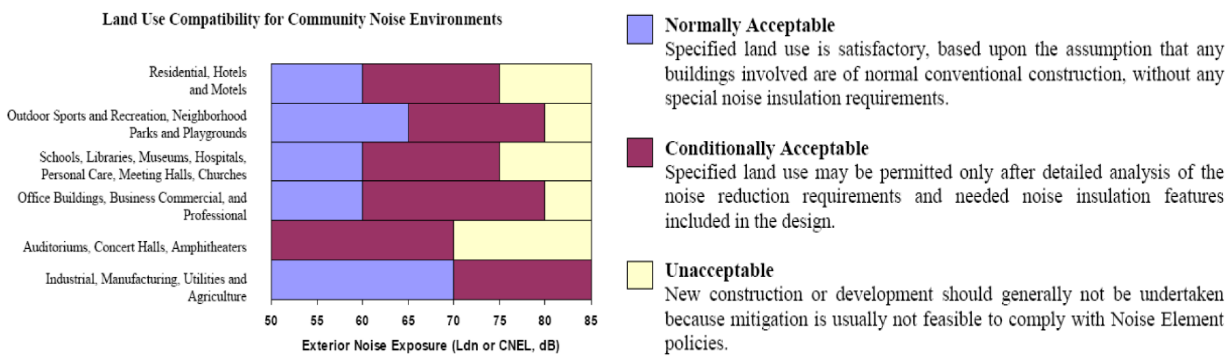
Local

City of Pinole General Plan

The Health and Safety Element (Chapter 9) of the City of Pinole General Plan contains goals, policies and actions to ensure that City residents are not subjected to noise beyond acceptable levels. The General Plan goals, policies and actions which are applicable to the project are reproduced below.

GOAL H.8 Ensure all new development complies with the noise standards established in the Pinole Health and Safety Element, and prevent all new noise sources from increasing the existing noise levels above acceptable standards.

Policy HS.8.1 New development projects should meet acceptable exterior noise level standards. The normally acceptable noise standards for new land uses are established in Land Use Compatibility for Community Exterior Noise Environments (as shown below).



<u>Action HS.8.1.1</u>

Adopt a noise ordinance with noise level performance standards, including maximum allowable noise exposure, ambient versus nuisance noise, method of measuring noise, and enforcement procedures.

<u>Action HS.8.12</u>

Review development proposals to assure consistency with noise standards. Require new development of noise-creating uses to conform to the City's noise level standards.

<u>Action HS.8.1.3</u>

Require a combination of design features to reduce noise impacts on adjacent properties through the following and other means, as appropriate:

- Screen and control noise sources such as parking, outdoor activities and mechanical equipment.
- Increase setbacks for noise sources from adjacent dwellings.
- Modify building designs and site planning to reduce noise exposure through a combination of sound attenuation (e.g., sound-rated windows and ventilation systems, insulation, physical and landscape buffers) and site planning (e.g., increased separation and private open area buffers) to reduce noise exposure.
- Control hours of operation, including deliveries and trash pickup, to minimize noise impacts.
- Require additional landscaping to assist with buffering where feasible.

Action HS.8.1.5

Require the use of temporary construction noise control measures including the use of temporary noise barriers, temporary relocation of noise-sensitive land uses, or other appropriate measures as mitigation for noise generated during construction of public and/or private projects.

Action HS.8.2.1

Require an acoustical analysis as part of the environmental review process when noise-sensitive land uses are proposed in areas where current or projected exterior noise levels exceed the City's standards.

Action HS.9.1

Noise created by commercial or industrial sources associated with new projects or developments should be controlled so as not to exceed the noise level standards set forth in the table below (Maximum Allowable Noise Exposure for Stationary Noise Sources), as measured at any affected residential land use.

Maximum Allowable Noise Exposure for Stationary Noise Sources[1]

Noise Descriptor	Daytime (7 AM to 10 PM)[5]	Nighttime (10 PM to 7 AM)[2,5]
Hourly L_{eq}, dB[3]	55	45
Maximum Level, dB[3]	70	65
Maximum Level, dB – Impulsive[4]	65	60

1 As determined at the property line of the receiving land use. When determining effectiveness of noise mitigation measures, the standards may be applied on the receptor side of noise barriers or other property line noise mitigation measures.
2 Applies only where the receiving land use operates or is occupied during nighttime hours.
3 Sound level measurements shall be made with "slow" meter response.
4 Sound level measurements shall be made with "fast" meter response.
5 Allowable levels shall be raised to the ambient noise levels where the ambient levels exceed the allowable levels. Allowable levels shall be reduced by 5 dB if the ambient hourly Leq is at least 10 dB lower than the allowable level.

Pinole Municipal Code

The Pinole Municipal Code does not include noise standards applicable to transportation or non-transportation noise sources. However, the Municipal Code does include hourly restrictions and nuisance provisions pertaining to construction activities, which have been reproduced below.

15.02.070 Permitted hours and condition of construction; penalties.

A. Work is allowed from 7:00 a.m. to 5:00 p.m. on non-federal holidays. Work is allowed on holidays recognized by the City of Pinole, but not acknowledged federally which include Cesar Chavez's Birthday and the Day After Thanksgiving, but no inspections will be performed.

B. Saturday work is allowed in commercial zones only, from 9:00 a.m. to 6:00 p.m., as long as it is interior work and does not generate significant noise.

D. Exceptions for commercial construction. The City Council designates the City Manager (or his/her designee) to further modify on a case-by-case basis the hours of construction in commercial zones. Additionally, the City Manager (or his/her designee) has the ability to modify the construction hours on a case-by-case basis based on inclement weather conditions or certain construction procedures (such as setting up for a concrete pour) and construction project characteristics that may require working beyond 5:00 p.m. on weekdays or 6:00 p.m. on Saturday.

E. The minimum fine for a citation or penalty for violating construction hours is $1,000 dollars, and escalates in $1,000 increments.

Environmental Setting - Existing Ambient Noise and Vibration Environment

Noise-Sensitive Land Uses in the Project Vicinity

Noise-sensitive land uses are generally defined as locations where people reside or where the presence of unwanted sound could adversely affect the primary intended use of the land. Places where people live, sleep, recreate, worship, and study are generally considered to be sensitive to noise because intrusive noise can be disruptive to these activities.

The noise-sensitive land uses which would potentially be affected by the project consist of residential uses. Specifically, single-family residential land uses are located to the west of the project site. Existing commercial uses are located to the east of the project site, which are typically not considered to be noise-sensitive. The project area and surrounding land uses are shown on Figure 1.

Existing Traffic Noise Levels along Project Area Roadway Network

The FHWA Traffic Noise Model (FHWA-RD-77-108) was used to develop existing noise contours expressed in terms of L_{dn} for major roadways within the project study area. The FHWA model predicts hourly L_{eq} values for free-flowing traffic conditions. Estimates of the hourly distribution of traffic for a typical 24-hour period were used to develop L_{dn} values from L_{eq} values.

Traffic data in the form of AM and PM peak hour movements for existing conditions were obtained from the client (prepared by TJKM Traffic Consultants). Average daily traffic volumes were conservatively estimated by applying a factor of 5 to the sum of AM and PM peak hour conditions. Using these data and the FHWA model, traffic noise levels were calculated. The traffic noise level at 50 feet from the roadway centerline and distances from the centerlines of selected roadways to the 60 dB, 65 dB, and 70 dB L_{dn} contours are summarized in Table 4.

In many cases, the actual distances to noise level contours may vary from the distances predicted by the FHWA model. Factors such as roadway curvature, roadway grade, shielding from local topography or structures, elevated roadways, or elevated receivers may affect actual sound propagation.

It is also recognized that existing sensitive land uses within the project vicinity are located varying distances from the centerlines of the local roadway network. The 50 foot reference distance is utilized in this analysis to provide a reference position at which changes in existing and future traffic noise levels resulting from the project can be evaluated. Appendix B contains the FWHA model inputs for existing conditions.

Table 4
Existing (2019) Traffic Noise Modeling Results

Seg.	Intersection	Direction	L_{dn} 50 Feet from Roadway	Distance to Contour (feet) 70 dB L_{dn}	65 dB L_{dn}	60 dB L_{dn}
1	Project Driveway / Tara Hills Drive	North	56	6	13	27
2		South	58	8	17	36
3		East	65	24	52	112
4		West	64	20	44	95
5	Appian Way / Tara Hills Drive	North	65	21	46	100
6		South	69	45	97	209
7		East	57	6	14	29
8		West	65	24	52	113
9	Appian Way / I-80 WB Ramps	North	69	45	98	210
10		South	69	44	94	203
11		East	67	34	72	156
12		West	67	30	65	140
13	Appian Way / I-80 EB Ramps	North	69	44	95	205
14		South	70	48	104	224
15		East	67	33	71	152
16		West	67	30	64	139

Source: FHWA-RD-77-108 with inputs from TJKM. Appendix B contains the FHWA model inputs.

Existing Overall Ambient Noise Environment within the Project Vicinity

The existing ambient noise environment within the project vicinity is defined primarily by noise from traffic on Interstate 80, Tara Hills Drive and Appian Way. To generally quantify existing ambient noise environment at the nearest existing sensitive uses to the project site, short-term (15-minute) ambient noise surveys were conducted at four locations on July 8, 2019. The noise survey locations are shown on Figure 1. Photographs of the noise survey locations are provided in Appendix C.

A Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meter was used to complete the noise level measurement surveys. The meter was calibrated immediately before and after use with an LDL Model CA200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all specifications of the American National Standards Institute requirements for Type 1 sound level meters (ANSI S1.4). A summary of the measurement results is provided in Table 5.

Table 5
Short-Term Ambient Noise Monitoring Results – July 8, 2019

Site	Description	Time	Measured Noise Levels, dB	
			L_{eq}	L_{max}
ST-1	Centrally located along the western project boundary	2:58 PM	54	68
ST-2	Located along the northwest project boundary	3:15 PM	60	81
ST-3	Located along the southwest project boundary	3:32 PM	62	82
ST-4	North of project site, adjacent to Tara Hills Drive	3:57 PM	66	75
Source: Bollard Acoustical Consultants, Inc. (2019)				

The Table 5 indicate that measured average ambient noise levels ranged from 54 dB to 66 dB while maximum noise levels ranged from 68 dB to 82 dB.

<u>Adjustments to General Plan Non-Transportation Noise Standards Based on Ambient Conditions</u>

Footnote 5 of Table 3 (Maximum Allowable Noise Exposure for Stationary Noise Sources) indicates that allowable noise levels shall be increased to the ambient noise level where ambient noise levels exceed the standards shown above. The City of Pinole General Plan establishes baseline noise level limits of 55 dB L_{eq} and 70 dB L_{max} during daytime hours (7:00 a.m. to 10:00 p.m.), and 45 dB L_{eq} and 65 dB L_{max} during nighttime hours (10:00 p.m. to 7:00 a.m.).

A noise assessment was previously prepared for the project by Charles M. Salter Associates, Inc. on July 18, 2019 (noise study provided as Appendix D). The noise assessment included ambient noise level measurements conducted on the western end of the project site from May 3-6, 2019. Results from this monitoring effort indicate that the lowest hourly average (L_{eq}) was measured to be 54 dB at that location during the monitoring period (at 2:00 a.m. on two days). Based on the above-mentioned measured ambient nighttime (10:00 p.m. to 7:00 a.m.) noise level, the General Plan nighttime hourly average (L_{eq}) noise level standard applicable to the project would be 54 dB L_{eq}. Because measured nighttime maximum (L_{max}) noise level data from this monitoring effort was not available, the unadjusted (baseline) General Plan 65 dB L_{max} nighttime noise level standard was applied to the project.

Ambient daytime noise level surveys were conducted on the project site by BAC on July 8, 2019. The noise measurement locations are shown on Figure 1 – the results of the noise level survey are summarized in Table 5. BAC noise survey locations ST-1 through ST-3 were selected to be representative of ambient noise conditions at various existing residences adjacent to the project site. Specifically, noise measurements at site ST-1 are believed to be representative of the existing ambient noise environment at the nearest residences centrally located along the western project boundary. Noise survey sites ST-2 and ST-3 were selected to be representative of the existing ambient noise environment at the nearest residences along the northwestern and southwestern project boundary, respectively. Based on the results from the Charles M Salter Associates, Inc. and BAC noise level surveys, the General Plan daytime and nighttime noise level limits applicable to the project are summarized in Table 6.

Table 6
Adjusted General Plan Noise Level Standards Applicable to the Project

Adjacent Residential Locations	Measured Noise Levels				Unadjusted Standards				Adjustment for Measured Ambient?				Applicable Standards[1]			
	Daytime		Nighttime		Daytime		Nighttime		Daytime		Nighttime		Daytime		Nighttime	
	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}
West	54	68	54	--	55	70	45	65	N	N	Y	N	55	70	54	65
Northwest	60	81	54	--	55	70	45	65	Y	Y	Y	N	60	81	54	65
Southwest	62	82	54	--	55	70	45	65	Y	Y	Y	N	62	82	54	65

[1] Applicable noise levels at adjacent residence locations are based upon measurements from the Salter and BAC ambient noise level surveys.

Existing Ambient Vibration Environment

During a site visit on July 8, 2019, vibration levels were below the threshold of perception at the project site. Nonetheless, to quantify existing vibration levels at the project site, BAC conducted short-term (15-minute) vibration measurements at the four locations identified on Figure 1. Photographs of the vibration survey locations are provided in Appendix C.

A Larson-Davis Laboratories Model LxT precision integrating sound level meter equipped with a vibration transducer was used to complete the measurements. The results are summarized below in Table 7.

Table 7
Summary of Ambient Vibration Level Survey Results – July 8, 2019

Site	Description	Time	Average Measured Vibration Level, PPV (in. sec)[1]
ST-1	West end of project site	2:46 PM	<0.001
ST-2	Northwest end of the project site	3:19 PM	<0.001
ST-3	Southwest end of the project site	3:34 PM	0.027
ST-4	North of project site, adjacent to Tara Hills Drive	3:58 PM	<0.001

[1] PPV = Peak Particle Velocity (inches/second)
Source: Bollard Acoustical Consultants, Inc. (2019)

The Table 7 data indicate that the measured average vibration levels during the monitoring period ranged from less than 0.001 to 0.027 in/sec PPV. Upon further analysis of BAC field notes and the vibration measurement data, it was determined that the measured average vibration level of 0.027 in/sec PPV at site ST-3 included two heavy truck passbys within close proximity to the vibration monitoring equipment.

Impacts and Mitigation Measures

Thresholds of Significance

For the purposes of this report, a noise and vibration impact is considered significant if the project would result in:

- Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or other applicable standards of other agencies; or
- Generation of excessive groundborne vibration or groundborne noise levels; or
- For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.

The project site is not within the vicinity of a private airstrip, an airport land use plan, or within two miles of a public airport. Therefore, the last threshold listed above is not discussed further.

The following criteria based on standards established by the Federal Interagency Commission on Noise (FICON), California Department of Transportation (Caltrans), City of Pinole General Plan and Pinole Municipal Code were used to evaluate the significance of environmental noise and vibration resulting from the project:

- A significant noise impact would be identified if the project would expose persons to or generate noise levels that would exceed applicable noise standards presented in the City of Pinole General Plan or Pinole Municipal Code.
- A significant impact would be identified if off-site traffic noise exposure or on-site activities generated by the project would substantially increase noise levels at existing sensitive receptors in the vicinity. A substantial increase would be identified relative to the FICON standards provided in Table 1.
- A significant impact would be identified if project construction activities or proposed on-site operations would expose noise-sensitive receptors to excessive groundborne vibration levels. Specifically, an impact would be identified if groundborne vibration levels due to these sources would exceed the Caltrans vibration impact criteria.

Noise Impacts Associated with Project-Generated Increases in Off-Site Traffic

With development of the project, traffic volumes on the local roadway network will increase. Those increases in daily traffic volumes will result in a corresponding increase in traffic noise levels at existing uses located along those roadways. The FHWA Model was used with traffic input data from the traffic impact analysis (prepared by TJKM Traffic Consultants) to predict project traffic noise level increases relative to Existing and Cumulative conditions.

Impact 1: Increases in Existing Traffic Noise Levels due to the Project

Traffic data in the form of AM and PM peak hour movements for Existing and Existing Plus Project conditions in the project area roadway network were obtained from the project transportation impact analysis completed by TJKM Traffic Consultants. Average daily traffic (ADT) volumes were conservatively estimated by applying a factor of 5 to the sum of AM and PM peak hour conditions.

Existing versus Existing Plus Project traffic noise levels on the local roadway network are shown in Table 8. The following section includes an assessment of predicted traffic noise levels relative to the FICON increase significance noise criteria identified in Table 1. The Table 8 data are provided in terms of L_{dn} at a standard distance of 50 feet from the centerlines of the project-area roadways. Appendix B contains the FWHA model inputs.

Table 8
Traffic Noise Modeling Results and Project-Related Traffic Noise Increases
Existing vs. Existing Plus Project Conditions

Segment	Intersection	Direction	Traffic Noise Level at 50 feet, dB L_{dn}			Substantial Increase?
			E	E+P	Increase	
1	Project Drive / Tara Hills Drive	North	56.0	56.0	0.0	No
2		South	57.8	59.2	1.4	No
3		East	65.2	65.6	0.4	No
4		West	64.2	64.3	0.1	No
5	Appian Way / Tara Hills Drive	North	64.5	64.6	0.1	No
6		South	69.3	69.4	0.1	No
7		East	56.5	56.7	0.2	No
8		West	65.3	65.6	0.3	No
9	Appian Way / I-80 WB Ramps	North	69.4	69.4	0.0	No
10		South	69.1	69.2	0.1	No
11		East	67.4	67.5	0.1	No
12		West	66.7	66.7	0.0	No
13	Appian Way / I-80 EB Ramps	North	69.2	69.2	0.0	No
14		South	69.8	69.8	0.0	No
15		East	67.2	67.2	0.0	No
16		West	66.7	66.7	0.0	No
Source: FHWA-RD-77-108 with inputs from TJKM. Appendix B contains the FHWA model inputs.						

The data in Table 8 indicate that traffic generated by the project would not result in an increase of traffic noise levels on the local roadway network. Relative to the FICON significance criteria identified in Table 1, the increases would not be considered substantial. As a result, off-site traffic noise impacts related to increases in traffic resulting from the implementation of the project (Existing vs. Existing Plus Project conditions) are identified as being ***less than significant***.

Impact 2: Increases in Cumulative Traffic Noise Levels due to the Project

Traffic data in the form of AM and PM peak hour movements for Cumulative and Cumulative Plus Project conditions in the project area roadway network were obtained from the project transportation impact analysis completed by TJKM Traffic Consultants. Average daily traffic (ADT) volumes were conservatively estimated by applying a factor of 5 to the sum of AM and PM peak hour conditions.

Cumulative versus Cumulative Plus Project traffic noise levels on the local roadway network are shown in Table 9. The following section includes an assessment of predicted traffic noise levels relative to the FICON increase significance noise criteria identified in Table 1. The Table 9 data are provided in terms of L_{dn} at a standard distance of 50 feet from the centerlines of the project-area roadways. Appendix B contains the FWHA model inputs.

Table 9
Traffic Noise Modeling Results and Project-Related Traffic Noise Increases
Cumulative vs. Cumulative Plus Project Conditions

Segment	Intersection	Direction	Traffic Noise Level at 50 feet, dB L_{dn}			Substantial Increase?
			C	C+P	Increase	
1	Project Drive / Tara Hills Drive	North	56.3	56.4	0.1	No
2		South	58.2	59.5	1.3	No
3		East	65.6	65.9	0.3	No
4		West	64.5	64.6	0.1	No
5	Appian Way / Tara Hills Drive	North	64.8	64.9	0.1	No
6		South	69.7	69.8	0.1	No
7		East	56.9	57.1	0.2	No
8		West	65.7	66.0	0.3	No
9	Appian Way / I-80 WB Ramps	North	69.7	69.8	0.1	No
10		South	69.5	69.5	0.0	No
11		East	67.8	67.8	0.0	No
12		West	67.0	67.1	0.1	No
13	Appian Way / I-80 EB Ramps	North	69.5	69.6	0.1	No
14		South	70.1	70.1	0.0	No
15		East	67.6	67.6	0.0	No
16		West	67.0	67.1	0.1	No

Source: FHWA-RD-77-108 with inputs from TJKM. Appendix B contains the FHWA model inputs.

The data in Table 9 indicate that traffic generated by the project would not result in an increase of traffic noise levels on the local roadway network. Relative to the FICON significance criteria identified in Table 1, the increases would not be considered substantial. As a result, off-site traffic noise impacts related to increases in traffic resulting from the implementation of the project (Cumulative vs. Cumulative Plus Project conditions) are identified as being ***less than significant***.

Off-Site Noise Impacts Associated with On-Site Commercial Operations

The project proposes the demolition of existing retail uses and the construction/redevelopment of new commercial uses within three phases. The primary noise sources associated with the project have been identified on-site delivery truck circulation, loading dock activities, rooftop mechanical equipment (HVAC), restaurant drive-through operations, and parking lot movements. An assessment of each project-related noise source follows. The locations of the on-site noise sources included in this assessment are shown on Figure 2.

It should be noted that the site plans indicate that a 6-foot tall solid wood fence is proposed to be constructed along the entire western project property boundary. However, it is unclear whether or not the proposed wood fence would be constructed such that it would provide the necessary attenuation needed to perform as a noise barrier. As a result, the following analyses of project-generated noise exposure at the nearest existing residential uses (west) do not include offsets associated with a 6-foot tall noise barrier.

Impact 3: On-Site Delivery Truck Circulation Noise at Existing Off-Site Sensitive Uses

The project site plans indicate that delivery trucks will access the project site from Tara Hills Drive. Figure 2 shows the proposed on-site delivery truck routes.

According to the project applicant, it is estimated that the project could receive daily deliveries from up to 5 heavy trucks (3 Safeway trucks, 2 fuel tankers) and 15 medium trucks (combination of project tenants). Although the truck delivery hours are currently unknown, it has been the experience of BAC in similar projects that commercial uses typically can have deliveries during both daytime and nighttime hours.

Based on the information above and site design constraints (e.g., building capacities, orientation, site access points), the following conservative assumptions were made regarding deliveries at the businesses of the development:

- Fuel station: 1 heavy truck / 2 medium trucks during worst-case hour
- Shops 1, 2E & 3E: 2 medium trucks during worst-case hour
- Safeway and adjacent shops: 3 heavy trucks / 5 medium trucks during worst-case hour
- Drive-through restaurant: 1 medium truck during worst-case hour

Truck deliveries are expected to be relatively brief, and will occur at low speeds. To predict noise levels generated by truck deliveries, BAC utilized file data obtained from measurements conducted by BAC of heavy and medium duty truck passbys. According to BAC file data, single-event heavy truck passby noise levels are approximately 74 dB L_{max} and 83 dB SEL at a reference distance of 50 feet. BAC file data also indicate that single-event medium truck passby noise levels are approximately 66 dB L_{max} and 76 SEL at a reference distance of 50 feet.

Because the City of Pinole General Plan noise standards are provided in terms of both individual maximum noise levels and hourly average noise levels, it is necessary to identify the number of truck movements occurring during a typical busy hour of operations to assess compliance with the L_{eq}-based standards. Based on the worst-case hour truck delivery assumptions discussed above, the following delivery truck hourly average (L_{eq}) reference noise levels at a distance of 50 feet from the truck passby route were computed:

- Fuel station: 48 dB L_{eq} (maximum of 74 dB L_{max})
- Shops 1, 2E & 3E: 43 dB L_{eq} (maximum of 66 dB L_{max})
- Safeway and adjacent shops: 53 dB L_{eq} (maximum of 74 dB L_{max})
- Drive-through restaurant: 40 dB L_{eq} (maximum of 66 dB L_{max})

Based the reference noise levels above, and assuming standard spherical spreading loss (-6 dB per doubling of distance), on-site delivery truck circulation noise exposure at the property lines of the nearest existing residential uses to the west, northwest and southwest of the project site was calculated and the results of those calculations are presented in Table 10.

Table 10
Predicted On-Site Truck Circulation Noise Levels at Nearest Existing Sensitive Uses

Nearest Residential Property Lines	Distance from Truck Lane (ft)[1]	Predicted Noise Level, (dB)		Applicable City Noise Standards[2]			
				Daytime		Nighttime	
		L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}
West	25	59	80	55	70	54	65
Northwest	25	61	80	60	81	54	65
Southwest	35	57	77	62	82	54	65

[1] Distances measured from center nearest truck circulation lane to nearest residential property lines.
[2] Applicable noise levels based upon measurements from the Salter and BAC ambient noise level surveys.
Source: Bollard Acoustical Consultants, Inc. (2020)

As indicated in Table 10, on-site delivery truck circulation noise levels are predicted to exceed the applicable City of Pinole General Plan hourly average (L_{eq}) and maximum (L_{max}) daytime and nighttime noise level standards at a portion of the nearest existing residences to the west, northwest and southwest of the project. In addition, it is possible that project delivery truck circulation noise exposure could be above ambient daytime and nighttime noise levels at those existing sensitive uses. As a result, this impact is considered to be ***potentially significant.***

<u>Mitigation Impact 3:</u>

In order to satisfy applicable City of Pinole General Plan noise level limits at the nearest adjacent existing residential uses to the project, and subsequently result in truck circulation noise levels at or below ambient noise conditions at those residential uses, the following on-site delivery truck circulation noise mitigation measures should be implemented:

MM 3A: The construction of a solid noise barrier measuring 7-feet in height along the project property boundary, as indicated in Figure 2. The construction of a 7-foot solid noise barrier at the location indicated in Figure 2 will result in the satisfaction of the applicable General Plan daytime noise level limits at the nearest existing residential uses adjacent to the project. The resulting noise levels at the nearest residential uses, after construction of the recommended 7-foot tall barrier, includes consideration of a shielding offset to account for the substantial difference in elevations between the elevated truck lane and depressed sensitive areas of the of the adjacent residential uses, which is estimated to be approximately -3 dB.

Table 11 shows the calculated on-site truck circulation noise levels after implementation of a 7-foot tall noise barrier and shielding offset, as discussed above.

Table 11
Predicted On-Site Truck Circulation Noise Levels – Mitigated

Nearest Residential Property Lines	Predicted Noise Levels, (dB)[1]		Applicable City Daytime Noise Standards[2]	
	L_{eq}	L_{max}	L_{eq}	L_{max}
West	49	70	55	70
Northwest	51	70	60	81

[1] Predicted noise levels take into consideration the screening provided by a 7-foot tall noise barrier along the property line (as indicated in Figure 2), as well as for a shielding offset to account for a difference in elevations between the elevated truck lane and depressed sensitive areas of adjacent residential uses below.
[2] Applicable noise levels based upon measurements from ambient noise level surveys.
Source: Bollard Acoustical Consultants, Inc. (2020)

In addition to implementation of the mitigation discussed in above in MM 3A, the following mitigation measure should also be implemented:

MM 3B: The limitation of project truck deliveries to daytime hours only (7:00 a.m. to 10:00 p.m.).

Significance of Impact 3 after Mitigation: ***Less than Significant***

Impact 4: Loading Dock Activity Noise at Existing Sensitive Uses

The project proposes one primary loading dock at the rear (south end) of the Safeway grocery store. Figure shows the location of the proposed loading dock. The primary noise sources associated with loading dock areas is the heavy trucks stopping (air brakes), backing into the loading docks (back-up alarms), and pulling out of the loading docks. The primary noise sources associated with delivery activities are trucks stopping (air brakes), trucks backing into position (back-up alarms), and pulling away from the dock area (revving engines).

To quantify the noise generated by truck loading dock operations, BAC utilized noise level data obtained from BAC field measurements of a commercial warehouse facility. According to BAC measurement data, loading dock average and maximum noise levels are approximately 63 dB L_{eq} and 75 dB L_{max} at a reference distance of 50 feet.

Based on the project site plans, the existing residential uses to the west and northwest of the project site (located farthest away) would be completely shielded from view of the loading dock area by the proposed grocery store building itself. The worst-case loading dock noise exposure would be at the nearest existing residential uses to the southwest of the project site. Assuming standard spherical spreading loss (-6 dB per doubling of distance), loading dock noise exposure at the property line of the nearest existing residential use to the southwest of the project site was calculated and the results of those calculations are presented in Table 12.

Table 12
Predicted Loading Dock Activity Noise Levels at Nearest Existing Sensitive Use

Nearest Residential Property Lines	Distance from Loading Dock (ft)[1]	Predicted Noise Level, (dB)		Applicable City Noise Standards[2]			
				Daytime		Nighttime	
		L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}
Southwest	180	52	64	62	82	54	65

[1] Distances measured from center of loading dock area to property line of the nearest residential use.
[2] Applicable noise levels based upon measurements from the Salter and BAC ambient noise level surveys.
Source: Bollard Acoustical Consultants, Inc. (2020)

The Table 12 data indicate that noise levels generated by project loading dock activities are predicted to satisfy the applicable City of Pinole General Plan daytime and nighttime noise level standards at the property lines of the nearest existing residential uses (southwest of the project site). The predicted average hourly (L_{eq}) and maximum (L_{max}) noise levels shown in Table 12 are also below measured ambient daytime and nighttime noise levels measured at the nearest existing residential uses to the southwest (Table 6).

Because project loading dock activity noise level exposure is predicted to satisfy the applicable City of Pinole General Plan daytime and nighttime noise level limits, and because loading dock noise levels are not predicted to significantly increase ambient noise levels at existing sensitive uses, this impact is identified as being ***less than significant.***

Impact 5: Rooftop Mechanical Equipment Noise at Existing Sensitive Uses

According to the project site plans, the project is proposing the installation of rooftop mechanical equipment for maintaining comfortable temperatures within the future commercial buildings of the development. Such mechanical equipment would be shielded from view of nearby existing residential uses by the building parapets on top of the proposed commercial buildings. Figure 2 shows the proposed locations of the rooftop mechanical equipment.

Because mechanical equipment operation typically generates sustained, steady-state, noise levels, impacts of project rooftop mechanical equipment are assessed in this study relative to the City of Pinole General Plan hourly average (L_{eq}) noise level standards.

Noise from rooftop mechanical equipment has been measured by BAC to be 45-50 dB at a reference distance of 100 feet from the building facades of similar commercial uses, including shielding by the building parapet. When projected to the property line of the nearest existing residential use located approximately 120 feet from any project-related rooftop mechanical equipment, noise levels are calculated to be approximately 43 dB L_{eq} (including shielding from the building parapet). The predicted rooftop mechanical equipment noise level of 43 dB L_{eq} at the property line of the nearest existing residential use (southwest of the project site) would satisfy the applicable City of Pinole daytime and nighttime hourly average noise level limits of 62 and 54 dB L_{eq}, respectively. The predicted average hourly (L_{eq}) noise level of 43 dB L_{eq} is also below measured ambient daytime and nighttime noise levels measured at the nearest existing residential uses to the southwest (Table 6).

Because project rooftop mechanical equipment noise exposure is predicted to satisfy the applicable City of Pinole General Plan daytime and nighttime noise level limits, and because mechanical equipment noise levels are not predicted to significantly increase ambient noise levels at existing sensitive uses, this impact is identified as being ***less than significant.***

Impact 6: Restaurant Drive-Through Operations Noise at Existing Sensitive Uses

The site plans indicate that the project proposes the construction of a restaurant that will include a drive-through lane. The location of the restaurant and drive-through lane are shown on Figure 2.

To quantify the noise exposure of proposed drive-through vehicle passages and speaker usage at the nearest existing residential uses, BAC utilized noise measurement data collected for similar drive-through operations. According to BAC file data, drive-through speaker and vehicle idling noise levels are approximately 50 dB L_{eq} and 55 dB L_{max} at a reference distance of 50 feet.
The nearest existing residential uses to the proposed restaurant drive-through lane are located to the west and northwest of the project site. Using the above-mentioned measured reference noise levels, and assuming standard spherical spreading loss (-6 dB per doubling of distance), restaurant drive-through noise exposure at the property lines of the nearest existing residential uses was calculated and the results of those calculations are presented in Table 13.

Table 13
Predicted Restaurant Drive-Through Noise Levels at Nearest Existing Sensitive Uses

Nearest Residential Property Lines	Distance from Drive-Through Lane (ft)[1]	Predicted Noise Level, (dB)		Applicable City Noise Standards[2]			
				Daytime		Nighttime	
		L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}
West	430	31	36	55	70	54	65
Northwest	420	32	37	60	81	54	65

[1] Distances measured from the drive-through lane to the property lines of the nearest residential uses.
[2] Applicable noise levels based upon measurements from the Salter and BAC ambient noise level surveys.
Source: Bollard Acoustical Consultants, Inc. (2020)

As indicated in Table 13, noise levels generated by restaurant drive-through operations are predicted to satisfy the applicable City of Pinole General Plan daytime and nighttime noise level standards at the property lines of the nearest existing residential uses (west and northwest of the project site). The predicted average hourly (L_{eq}) and maximum (L_{max}) noise levels shown in Table 13 are also below measured ambient daytime and nighttime noise levels measured at the nearest existing residential uses to the west and northwest (Table 6).

Because project restaurant drive-through operations noise level exposure is predicted to satisfy the applicable City of Pinole General Plan daytime and nighttime noise level limits, and because restaurant drive-through noise levels are not predicted to significantly increase ambient noise levels at existing sensitive uses, this impact is identified as being ***less than significant.***

Impact 7: Parking Lot Activity Noise at Existing Sensitive Uses

As a means of determining potential noise exposure due to project parking lot activities, Bollard Acoustical Consultants, Inc. (BAC) utilized specific parking lot noise level measurements conducted by BAC. Specifically, a series of individual noise measurements were conducted of multiple vehicle types arriving and departing a parking area, including engines starting and stopping, car doors opening and closing, and persons conversing as they entered and exited the vehicles. The results of those measurements revealed that individual parking lot movements generated mean noise levels of approximately 70 dB SEL at a reference distance of 50 feet. The maximum noise level associated with parking lot activity typically did not exceed 65 dB L_{max} at the same reference distance.

To compute hourly average (L_{eq}) noise levels generated by parking lot activities, the approximate number of hourly operations in any given area and distance to the effective noise center of those activities is required. The parking areas proposed nearest to existing residential uses are located on the west and northwest sides of the project area – which are identified as Parking Areas 1 and 2 on Figure 2. According to the project site plans, Parking Areas 1 and 2 will accommodate approximately 150 and 50 parking spaces, respectively. It was conservatively assumed for the purposes of this analysis that all of the parking stalls could fill or empty during any given peak hour (worst-case). However, it is likely that parking area activity would be more spread out. The hourly average noise level generated by parking lot movements is computed using the following formula:

$$\text{Peak Hour } L_{eq} = 70+10*\log(N) - 35.6$$

Where 70 is the mean Sound Exposure Level (SEL) for an automobile parking lot arrival or departure, N is the number of parking lot operations in a given hour, and 35.6 is 10 times the logarithm of the number of seconds in an hour.

Using the information provided above, and assuming standard spherical spreading loss (-6 dB per doubling of distance), worst-case parking area noise exposure at the property lines of the nearest existing residential uses to the west and northwest of the project site was calculated and the results of those calculations are presented in Table 14.

Table 14
Predicted Worst-Case Parking Area Noise Levels at Nearest Existing Sensitive Uses

Nearest Residential Property Lines	Nearest Parking Area	Distance from Noise Center of Parking Area (ft)[1]	Predicted Noise Levels, (dB)		Applicable City Noise Standards[2]			
					Daytime		Nighttime	
			L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}
West	1	250	42	51	55	70	54	65
Northwest	2	100	45	59	60	81	54	65

1 Distances measured from effective noise center of parking areas to property lines of nearest residential uses.
2 Applicable noise levels based upon measurements from the Salter and BAC ambient noise level surveys.
Source: Bollard Acoustical Consultants, Inc. (2020)

The Table 14 data indicate that noise levels generated by project parking lot movements are predicted to satisfy the applicable City of Pinole General Plan daytime and nighttime noise level standards at the property lines of the nearest existing residential uses (west and northwest of the project site). The predicted average hourly (L_{eq}) and maximum (L_{max}) noise levels shown in Table 14 are also below measured ambient daytime and nighttime noise levels measured at the nearest existing residential uses to the west and northwest (Table 6).

Because project parking area noise level exposure is predicted to satisfy the applicable City of Pinole General Plan daytime and nighttime noise level limits, and because parking area noise levels are not predicted to significantly increase ambient noise levels at existing sensitive uses, this impact is identified as being ***less than significant.***

Impact 8: Cumulative (Combined) Noise Levels from On-Site Operations at Existing Sensitive Uses

The calculated unmitigated and mitigated cumulative noise levels of project on-site commercial operations at the nearest existing residential uses is presented are Tables 15 and 16, respectively. The mitigated cumulative noise levels shown in Table 16 include consideration of the shielding provided by a 7-foot tall property line noise barrier as discussed in MM 3A, and as illustrated on Figure 2.

It should be noted that due to the logarithmic nature of the decibel scale, the sum of two noise values which differ by 10 dB equates to an overall increase in noise levels of 0.4 dB. When the noise sources are equivalent, the sum would result in an overall increase in noise levels of 3 dB.

Table 15
Predicted Cumulative Project Noise Levels at Nearest Existing Sensitive Uses – Unmitigated

Residential Property	Predicted Project Operations Noise Levels, (dB)[1]											Applicable City Noise Standards[2]			
	Truck Circulation		Loading Dock		HVAC	Drive Through		Parking Area		Cumulative		Daytime		Nighttime	
	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}
West	59	80	31	43	39	31	36	42	51	59	80	55	70	54	65
Northwest	61	80	27	39	33	32	37	45	59	61	80	60	81	54	65
Southwest	57	77	52	64	43	<20	<20	26	34	58	77	62	82	54	65

[1] Predicted noise levels include shielding provided by intervening on-site buildings (where applicable), and a screening offset to account for the difference in elevations between the elevated project site and depressed sensitive areas of the adjacent residential uses.

[2] Applicable noise levels based upon measured ambient conditions from both the Salter and BAC ambient noise level surveys.

Source: Bollard Acoustical Consultants, Inc. (2020)

Table 16
Predicted Cumulative Project Noise Levels at Nearest Existing Sensitive Uses – Mitigated (7-Foot Tall Noise Barrier)

Residential Property	Predicted Project Operations Noise Levels, (dB)[1]											Applicable City Noise Standards[2]			
	Truck Circulation		Loading Dock		HVAC	Drive Through		Parking Area		Cumulative		Daytime		Nighttime	
	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}
West	49	70	20	32	29	20	25	30	40	49	70	55	70	54	65
Northwest	51	70	<20	28	23	21	26	34	48	51	70	60	81	54	65
Southwest	57	77	52	64	43	<20	<20	26	34	58	77	62	82	54	65

[1] Predicted noise levels include the implementation of mitigation as outlined in this report (MM 3A – 7-foot tall noise barrier), shielding provided by intervening on-site buildings (where applicable), and a screening offset to account for the difference in elevations between the elevated project site and depressed sensitive areas of the adjacent residential uses.

[2] Applicable noise levels based upon measured ambient conditions from both the Salter and BAC ambient noise level surveys.

Source: Bollard Acoustical Consultants, Inc. (2020)

The Table 15 data indicate that cumulative unmitigated on-site project-related noise levels are predicted to exceed the City of Pinole General Plan daytime and nighttime hourly average (L_{eq}) and maximum (L_{max}) noise level standards at a portion of the nearest residential property lines. However, after implementation of mitigation measure MM 3A (construction of a 7-foot tall solid noise barrier as indicated in Figure 2), cumulative mitigated on-site project noise levels are predicted to satisfy the applicable City of Pinole General Plan daytime hourly average (L_{eq}) and maximum (L_{max}) noise level standards at the property lines of the nearest existing residential uses (Table 16). The predicted mitigated cumulative noise levels shown in Table 16 are also below measured ambient daytime noise levels measured at the nearest existing residential uses (Table 6).

Although the cumulative mitigated noise levels from on-site project operations are predicted to satisfy the applicable City of Pinole General Plan daytime noise level criteria, they would still exceed the City's nighttime noise level criteria at the nearest residential uses (Table 16). In addition, it is possible that cumulative noise exposure could be above ambient nighttime noise levels at those existing sensitive uses. As a result, this impact is considered to be ***potentially significant.***

<u>Mitigation Impact 8:</u>

In order to avoid a potential exceedance of City of Pinole General Plan nighttime noise level criteria at the nearest adjacent existing residential uses, the following noise mitigation measure should be implemented by the project:

MM 8: The limitation of project truck deliveries to daytime hours only (7:00 a.m. to 10:00 p.m.).

Significance of Impact 8 after Mitigation: ***Less than Significant***

Noise Impacts Associated with Project Construction Activities

Impact 9: Project Construction Noise Levels at Existing Sensitive Uses

During project construction, heavy equipment would be used for grading excavation, paving, and building construction, which would increase ambient noise levels when in use. Noise levels would vary depending on the type of equipment used, how it is operated, and how well it is maintained. Noise exposure at any single point outside the project work area would also vary depending upon the proximity of equipment activities to that point. The property lines of the nearest existing residential uses are located approximately 30 feet away from where construction activities would occur on the project site.

Table 16 includes the range of maximum noise levels for equipment commonly used in general construction projects at full-power operation at a distance of 50 feet. Not all of these construction activities would be required of this project. The Table 16 data also include predicted maximum equipment noise levels at the property lines of the nearest sensitive uses located approximately 30 feet away, which assume a standard spherical spreading loss of 6 dB per doubling of distance.

Table 16
Construction Equipment Reference Noise Levels and Predicted Noise Levels 30 Feet

Equipment Description	Maximum Noise Level at 50 Feet, dBA	Predicted Maximum Noise Level at 30 feet, dBA
Air compressor	80	84
Backhoe	80	84
Ballast equalizer	82	86
Ballast tamper	83	87
Compactor	82	86
Concrete mixer	85	89
Concrete pump	82	86
Concrete vibrator	76	80
Crane, mobile	83	87
Dozer	85	89
Generator	82	86
Grader	85	89
Impact wrench	85	89
Jack hammer	88	92
Loader	80	84
Paver	85	89
Pneumatic tool	85	89
Pump	77	81
Rail saw	90	94
Saw	76	80
Scarifier	83	87
Scraper	85	89
Shovel	82	86
Spike driver	77	81
Tie cutter	84	88
Tie handler	80	84
Tie inserter	85	89
Truck	84	88

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Table 7-1 (2018)

Based on the equipment noise levels in Table 16, worst-case on-site project construction equipment noise levels at the property lines of the nearest existing residential uses located 30 feet away are expected to range from approximately 80 to 94 dB. Thus, it is possible that a portion of the project construction equipment could result in substantial short-term increases over ambient maximum noise levels at the nearest existing sensitive uses. Further, it is possible that those noise levels could exceed the applicable City of Pinole General Plan noise level limits. As a result, noise impacts associated with construction activities are identified as being ***potentially significant***.

Mitigation Impact 9: Construction Noise Control Measures

MM 9: To the maximum extent practical, the following measures should be incorporated into the project construction operations:

- Pursuant to City of Pinole General Plan Action HS.8.1.5, the project shall utilize temporary construction noise control measures including the use of temporary noise barriers, or other appropriate measures as mitigation for noise generated during construction of projects.
- Pursuant to Pinole Municipal Code Section 15.02.070(A), construction work is allowed from 7:00 a.m. to 5:00 p.m. on non-federal holidays. Construction work is allowed on holidays recognized by the City of Pinole, but not acknowledged federally which include Cesar Chavez's Birthday and the Day after Thanksgiving, but no inspections will be performed.
- Pursuant to Pinole Municipal Code Section 15.02.070(B), construction work on Saturdays is allowed in commercial zones only, from 9:00 a.m. to 6:00 p.m. as long as it is interior work and does not generate significant noise.
- All noise-producing project equipment and vehicles using internal-combustion engines shall be equipped with manufacturers-recommended mufflers and be maintained in good working condition.
- All mobile or fixed noise-producing equipment used on the project site that are regulated for noise output by a federal, state, or local agency shall comply with such regulations while in the course of project activity.
- Electrically powered equipment shall be used instead of pneumatic or internal-combustion-powered equipment, where feasible.
- Material stockpiles and mobile equipment staging, parking, and maintenance areas shall be located as far as practicable from noise-sensitive receptors.
- Project area and site access road speed limits shall be established and enforced during the construction period.
- Nearby residences shall be notified of construction schedules so that arrangements can be made, if desired, to limit their exposure to short-term increases in ambient noise levels.

Significance of Impact 9 after Mitigation: *Less than Significant*

Vibration Impacts Associated with Project Activities

Impact 10: Project Construction Vibration at Existing Sensitive Uses

During project construction, heavy equipment would be used for grading, excavation, paving, and building construction, which would generate localized vibration in the immediate vicinity of the construction. The nearest existing sensitive uses are residential structures located approximately 50 feet from construction activities which would occur within the project site.

Table 17 includes the range of vibration levels for equipment commonly used in general construction projects at a distance of 25 feet. The Table 17 data also include predicted equipment vibration levels at the nearest existing residences to the project site located approximately 50 feet away.

Table 17
Vibration Source Levels for Construction Equipment and Predicted Levels at 50 Feet

Equipment	Maximum PPV (inches/second)[1]	
	Maximum PPV at 25 Feet[2]	Predicted PPV at 50 Feet
Hoe ram	0.089	0.032
Large bulldozer	0.089	0.032
Caisson drilling	0.089	0.032
Loaded trucks	0.076	0.027
Jackhammer	0.035	0.012
Small bulldozer	0.003	0.011

1 PPV = Peak Particle Velocity
2 Reference vibration level obtained from the Federal Transit Administration (FTA), Transit Noise and Vibration Impact Assessment Manual (2018).

As indicated in Table 17, vibration levels generated from on-site construction activities at the nearest existing residences are predicted to be well below the strictest Caltrans thresholds for damage to residential structures of 0.30 in/sec PPV shown in Table 2. Further, the predicted vibration levels are also below the Caltrans thresholds for annoyance presented in Table 3. Therefore, on-site construction within the project area would not result in excessive groundborne vibration levels at nearby existing residential uses.

Because vibration levels due to the proposed project will satisfy the applicable Caltrans groundborne impact vibration criteria at the nearest existing sensitive uses, this impact is considered to be ***less than significant***.

Impact 11: Project Commercial Operations Vibration

The project proposes the redevelopment and operation of commercial uses would include on-site operations such as delivery truck circulation, loading and unloading activities, parking lot movements, and mechanical equipment. It is the experience of BAC that operations associated with limited loading dock operations do not typically have equipment that generates appreciable vibration. In addition, it is our understanding that the project does not propose on-site equipment that will produce appreciable vibration. Lastly, vibration levels from heavy trucks traveling on a roadway, such as those generated from project heavy truck traffic, rarely generate vibration amplitudes high enough to cause structural or cosmetic damage.

The Table 7 data indicate that measured average vibration levels at the project site were below the strictest Caltrans thresholds for damage to structures and thresholds for annoyance, which included heavy truck passbys within close proximity to the measurement equipment. Therefore, it is expected that the project would not result in the exposure of persons to excessive groundborne vibration levels at existing sensitive uses or proposed uses of the project.

Because vibration levels due to and upon the proposed project are expected to be below the strictest Caltrans thresholds for damage to structures and thresholds for annoyance at sensitive receptors, this impact is considered to be ***less than significant***.

This concludes BAC's noise and vibration assessment of the Pinole Square Redevelopment Phases 1-3 project in Pinole, California. Please contact BAC at (916) 663-0500 or dariog@bacnoise.com if you have any comments or questions regarding this report.

Appendix A

Acoustical Terminology

Acoustics The science of sound.

Ambient Noise The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.

Attenuation The reduction of an acoustic signal.

A-Weighting A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.

Decibel or dB Fundamental unit of sound, A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.

CNEL Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.

Frequency The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz.

Ldn Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.

Leq Equivalent or energy-averaged sound level.

Lmax The highest root-mean-square (RMS) sound level measured over a given period of time.

Loudness A subjective term for the sensation of the magnitude of sound.

Masking The amount (or the process) by which the threshold of audibility is for one sound is raised by the presence of another (masking) sound.

Noise Unwanted sound.

Peak Noise The level corresponding to the highest (not RMS) sound pressure measured over a given period of time. This term is often confused with the Maximum level, which is the highest RMS level.

RT$_{60}$ The time it takes reverberant sound to decay by 60 dB once the source has been removed.

Sabin The unit of sound absorption. One square foot of material absorbing 100% of incident sound has an absorption of 1 sabin.

SEL A rating, in decibels, of a discrete event, such as an aircraft flyover or train passby, that compresses the total sound energy of the event into a 1-s time period.

Threshold of Hearing The lowest sound that can be perceived by the human auditory system, generally considered to be 0 dB for persons with perfect hearing.

Threshold of Pain Approximately 120 dB above the threshold of hearing.

Appendix B-1
FHWA Highway Traffic Noise Prediction Model Data Inputs
Pinole Square Redevelopment Phases 1-3
File Name: 2019-120 01 Existing
Model Run Date: 11/19/2019

BOLLARD Acoustical

Segment	Intersection	Direction	ADT	Day %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance
1	Project Driveway / Tara Hills Drive	North	2,100	80	20	2	1	25	50
2		South	3,220	80	20	2	1	25	50
3		East	12,290	80	20	2	1	30	50
4		West	9,640	80	20	2	1	30	50
5	Appian Way / Tara Hills Drive	North	14,880	80	20	2	1	25	50
6		South	24,625	80	20	2	1	35	50
7		East	2,360	80	20	2	1	25	50
8		West	12,525	80	20	2	1	30	50
9	Appian Way / I-80 WB Ramps	North	24,845	80	20	2	1	35	50
10		South	23,595	80	20	2	1	35	50
11		East	8,745	80	20	2	1	45	50
12		West	7,385	80	20	2	1	45	50
13	Appian Way / I-80 EB Ramps	North	23,870	80	20	2	1	35	50
14		South	27,260	80	20	2	1	35	50
15		East	8,400	80	20	2	1	45	50
16		West	7,330	80	20	2	1	45	50

Appendix B-2
FHWA Highway Traffic Noise Prediction Model Data Inputs
Pinole Square Redevelopment Phases 1-3
File Name: 2019-120 02 Existing Plus Project
Model Run Date: 11/19/2019

Segment	Intersection	Direction	ADT	Day %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance
1	Project Driveway / Tara Hills Drive	North	2,130	80	20	2	1	25	50
2		South	4,390	80	20	2	1	25	50
3		East	13,265	80	20	2	1	30	50
4		West	9,805	80	20	2	1	30	50
5	Appian Way / Tara Hills Drive	North	15,210	80	20	2	1	25	50
6		South	25,150	80	20	2	1	35	50
7		East	2,485	80	20	2	1	25	50
8		West	13,505	80	20	2	1	30	50
9	Appian Way / I-80 WB Ramps	North	25,370	80	20	2	1	35	50
10		South	23,915	80	20	2	1	35	50
11		East	8,850	80	20	2	1	45	50
12		West	7,485	80	20	2	1	45	50
13	Appian Way / I-80 EB Ramps	North	24,190	80	20	2	1	35	50
14		South	27,440	80	20	2	1	35	50
15		East	8,400	80	20	2	1	45	50
16		West	7,470	80	20	2	1	45	50

Appendix B-3
FHWA Highway Traffic Noise Prediction Model Data Inputs
Pinole Square Redevelopment Phases 1-3
File Name: 2019-120 03 Cumulative
Model Run Date: 11/19/2019

BOLLARD Acoustical

Segment	Intersection	Direction	ADT	Day %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance
1	Project Driveway / Tara Hills Drive	North	2,280	80	20	2	1	25	50
2		South	3,495	80	20	2	1	25	50
3		East	13,355	80	20	2	1	30	50
4		West	10,480	80	20	2	1	30	50
5	Appian Way / Tara Hills Drive	North	16,170	80	20	2	1	25	50
6		South	26,765	80	20	2	1	35	50
7		East	2,565	80	20	2	1	25	50
8		West	13,620	80	20	2	1	30	50
9	Appian Way / I-80 WB Ramps	North	27,000	80	20	2	1	35	50
10		South	25,645	80	20	2	1	35	50
11		East	9,505	80	20	2	1	45	50
12		West	8,030	80	20	2	1	45	50
13	Appian Way / I-80 EB Ramps	North	25,945	80	20	2	1	35	50
14		South	29,630	80	20	2	1	35	50
15		East	9,130	80	20	2	1	45	50
16		West	7,965	80	20	2	1	45	50

Appendix B-4
FHWA Highway Traffic Noise Prediction Model Data Inputs
Pinole Square Redevelopment Phases 1-3
File Name: 2019-120 04 Cumulative Plus Project
Model Run Date: 11/19/2019

Segment	Intersection	Direction	ADT	Day %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance
1	Project Driveway / Tara Hills Drive	North	2,310	80	20	2	1	25	50
2		South	4,680	80	20	2	1	25	50
3		East	14,330	80	20	2	1	30	50
4		West	10,660	80	20	2	1	30	50
5	Appian Way / Tara Hills Drive	North	16,500	80	20	2	1	25	50
6		South	27,275	80	20	2	1	35	50
7		East	2,690	80	20	2	1	25	50
8		West	14,585	80	20	2	1	30	50
9	Appian Way / I-80 WB Ramps	North	27,525	80	20	2	1	35	50
10		South	25,965	80	20	2	1	35	50
11		East	9,610	80	20	2	1	45	50
12		West	8,130	80	20	2	1	45	50
13	Appian Way / I-80 EB Ramps	North	26,265	80	20	2	1	35	50
14		South	29,810	80	20	2	1	35	50
15		East	9,130	80	20	2	1	45	50
16		West	8,105	80	20	2	1	45	50

Legend

A: ST-1: Noise survey equipment along west end of project area, looking north towards Tara Hills Drive (37°59’42.01” N, 122°18’20.76” W)
B: ST-1: Vibration survey equipment along west end of project area, looking north towards Tara Hills Drive (37°59’42.01” N, 122°18’20.76” W)
C: ST-2: Noise survey equipment along west end of project area, looking north towards Tara Hills Drive (37°59’43.60” N, 122°18’20.70” W)
D: ST-2: Vibration survey equipment along west end of project area, looking north towards Tara Hills Drive (37°59’43.60” N, 122°18’20.70” W)

Pinole Square Redevelopment
Phases 1-3
Pinole, California

Photographs of Noise & Vibration Survey Locations

Appendix C-1

BOLLARD
Acoustical Consultants

Legend

A: ST-3: Noise survey equipment along west end of project area, looking northwest towards residences (37°59’39.44” N, 122°18’20.95” W)
B: ST-3: Noise survey equipment along west end of project area, looking south towards Interstate 80 (37°59’39.44” N, 122°18’20.95” W)
C: ST-3: Vibration survey equipment along west end of project area (37°59’39.44” N, 122°18’20.95” W)
D: ST-4: Noise and vibration survey equipment at 1500 Tara Hills Drive facing west (37°59’44.27” N, 122°18’12.91” W)

Pinole Square Redevelopment
Phases 1-3
Pinole, California

Photographs of Noise & Vibration Survey Locations

Appendix C-2

BOLLARD
Acoustical Consultants

Appendix D-1

Charles M. **Salter**
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18 July 2019

Todd Green
Hillsboro Properties, Inc.
1300 S. El Camino Real, Suite 525
San Mateo, CA 94402
Email: todd@hillsboroprop.com

Subject: **Appian 80 Shopping Center**
Project-Related Noise Assessment
Salter Project: 19-0261

Dear Todd:

As required by the project COA, we have analyzed noise emissions from the proposed shopping center update. An analysis was made with regards to expected noise levels at the property line of the nearest neighbors (to the west). This letter summarizes our assessment.

ACOUSTICAL CRITERIA

City of Pinole Health and Safety Element

The City's Health and Safety Element has noise criteria for "stationary noise sources". The criteria are average noise levels of 55 dBA during the day and 45 dBA at night, and maximum noise levels of 70 dBA during the day and 65 dBA at night. The allowable levels are adjusted up or down depending on whether the ambient noise level is above or below the criteria.

These criteria would apply to HVAC noise and amplification systems, but not truck or construction activity.

MEASURED NOISE LEVELS

We measured the current ambient noise environment at the project site from 3 to 6 May 2019. The lowest (i.e., quietest) hourly L_{eq}[1] was measured to be 54 dBA (at 2 am on two days). Since this noise level is above the "base" criterion of 45 dBA, the criterion is increased to 54 dBA.

See **Appendix A** for a summary of the hourly noise levels during the measurement period (the quietest hours are noted in **bold** text). See **Figure 1** for the measurement location.

1 L_{eq} – The equivalent steady-state A-weighted sound level that, in a stated period of time, would contain the same acoustic energy as the time-varying sound level during the same period.

Appendix D-2

ANALYSIS

Based on the provided site plan and preliminary HVAC equipment selections (see **Figure 2**), we calculated the expected noise levels at the nearest residential property line. Published data for the amplification system at a typical drive-thru restaurant was not provided. However, we have measured these systems on other projects and have used that data for this analysis.

HVAC Equipment

The closest HVAC equipment to the western property line (a packaged air-conditioner unit) is approximately 100 feet away. The overall sound level when all equipment is operating is calculated to be up to 53 dBA at the property line.

Therefore, the calculated noise level is lower than the criterion (54 dBA) at the western property line and is expected to meet the criterion.

Drive-Thru

The project includes a proposed fast-food restaurant with a drive-thru lane. Based on our measured data, the amplification system from a typical drive-thru window can be up to 74 dBA at 25 feet. The project drive-thru speaker is approximately 450 feet from the western residential property line. Based on this information, we calculated noise levels to be approximately 50 dBA at the western property line, which meets the criterion.

Truck Activity and Construction Noise

We have not received information about typical trucking activity (e.g., number of deliveries per day, hours of deliveries) or a construction plan/schedule (e.g., type of equipment, duration, location). Once we receive this information, we can update our calculations and assessment of the project-related noise.

* * *

This concludes our assessment of the project-related noise for the Appian 80 project. Should you have any questions or comments, please give us a call.

Sincerely,

CHARLES M. SALTER ASSOCIATES, INC.

Blake M. Wells, LEED® Green Associate
Senior Consultant

Eric Mori, PE
Senior Vice President

Enclosures as noted

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Appendix D-3

APPENDIX A: MEASURED HOURLY AVERAGE NOISE LEVELS

Date	Time	Duration	L_{eq} (dBA)
3-May-19	20:00:00	1:00:00	62
3-May-19	21:00:00	1:00:00	61
3-May-19	22:00:00	1:00:00	61
3-May-19	23:00:00	1:00:00	59
4-May-19	0:00:00	1:00:00	56
4-May-19	1:00:00	1:00:00	56
4-May-19	2:00:00	1:00:00	57
4-May-19	3:00:00	1:00:00	56
4-May-19	4:00:00	1:00:00	57
4-May-19	5:00:00	1:00:00	58
4-May-19	6:00:00	1:00:00	59
4-May-19	7:00:00	1:00:00	60
4-May-19	8:00:00	1:00:00	61
4-May-19	9:00:00	1:00:00	60
4-May-19	10:00:00	1:00:00	60
4-May-19	11:00:00	1:00:00	64
4-May-19	12:00:00	1:00:00	64
4-May-19	13:00:00	1:00:00	60
4-May-19	14:00:00	1:00:00	63
4-May-19	15:00:00	1:00:00	61
4-May-19	16:00:00	1:00:00	62
4-May-19	17:00:00	1:00:00	62
4-May-19	18:00:00	1:00:00	62
4-May-19	19:00:00	1:00:00	61
4-May-19	20:00:00	1:00:00	61
4-May-19	21:00:00	1:00:00	60
4-May-19	22:00:00	1:00:00	58
4-May-19	23:00:00	1:00:00	58

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Appendix D-4

5-May-19	0:00:00	1:00:00	57
5-May-19	1:00:00	1:00:00	56
5-May-19	**2:00:00**	**1:00:00**	**54**
5-May-19	3:00:00	1:00:00	55
5-May-19	4:00:00	1:00:00	55
5-May-19	5:00:00	1:00:00	56
5-May-19	6:00:00	1:00:00	60
5-May-19	7:00:00	1:00:00	61
5-May-19	8:00:00	1:00:00	59
5-May-19	9:00:00	1:00:00	60
5-May-19	10:00:00	1:00:00	60
5-May-19	11:00:00	1:00:00	62
5-May-19	12:00:00	1:00:00	62
5-May-19	13:00:00	1:00:00	63
5-May-19	14:00:00	1:00:00	63
5-May-19	15:00:00	1:00:00	64
5-May-19	16:00:00	1:00:00	64
5-May-19	17:00:00	1:00:00	63
5-May-19	18:00:00	1:00:00	63
5-May-19	19:00:00	1:00:00	63
5-May-19	20:00:00	1:00:00	62
5-May-19	21:00:00	1:00:00	61
5-May-19	22:00:00	1:00:00	61
5-May-19	23:00:00	1:00:00	59
6-May-19	0:00:00	1:00:00	57
6-May-19	1:00:00	1:00:00	56
6-May-19	**2:00:00**	**1:00:00**	**54**
6-May-19	3:00:00	1:00:00	56
6-May-19	4:00:00	1:00:00	59
6-May-19	5:00:00	1:00:00	61

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Charles M. Salter
ASSOCIATES INC.

Appendix D-5

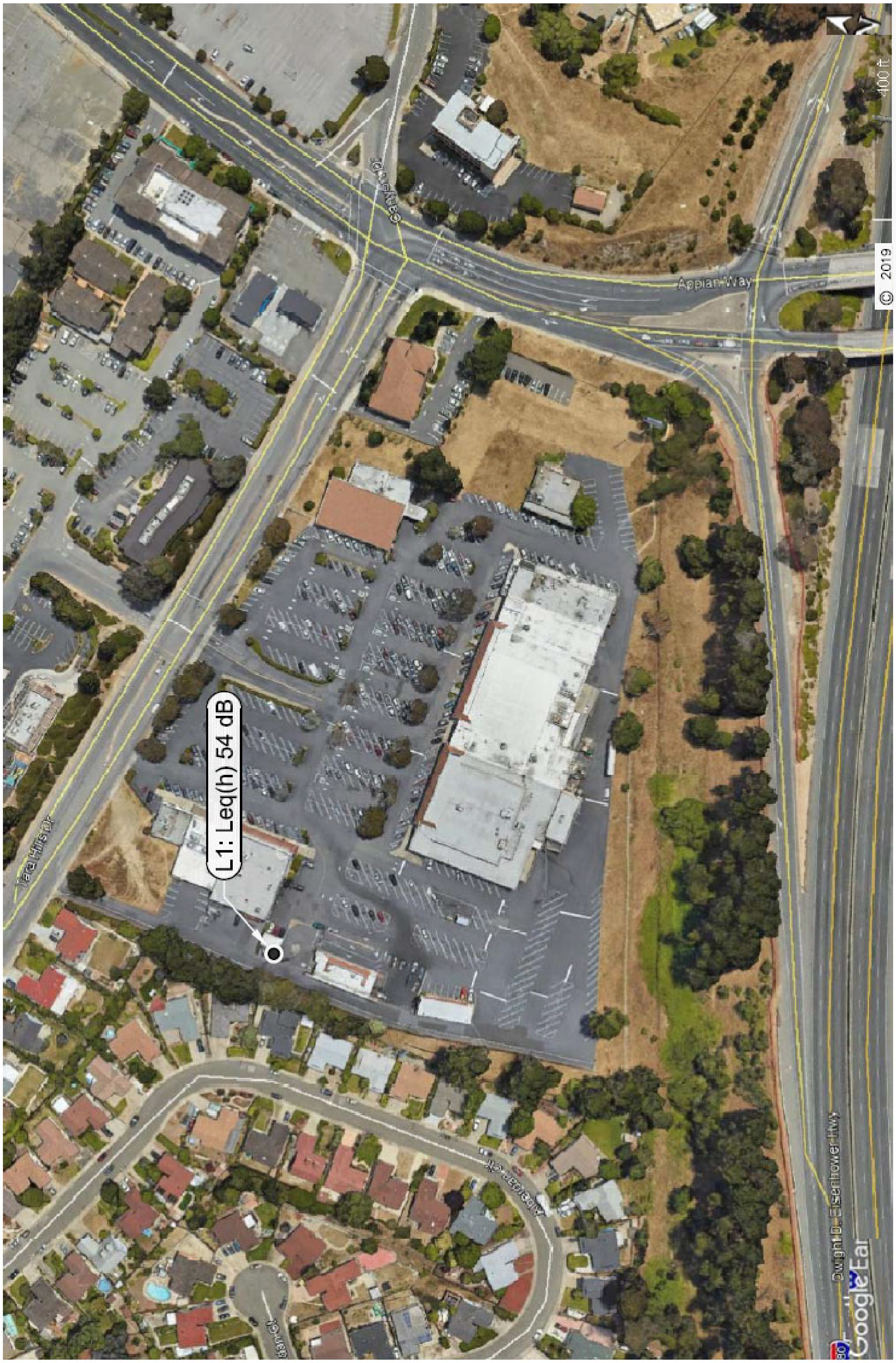

FIGURE 1

Salter #
19-0261

BMW/EBM
07.19.19

APPIAN 80 SHOPPING CENTER
MEASUREMENT LOCATIONS AND MEASURED
NOISE LEVELS

Appendix D-6

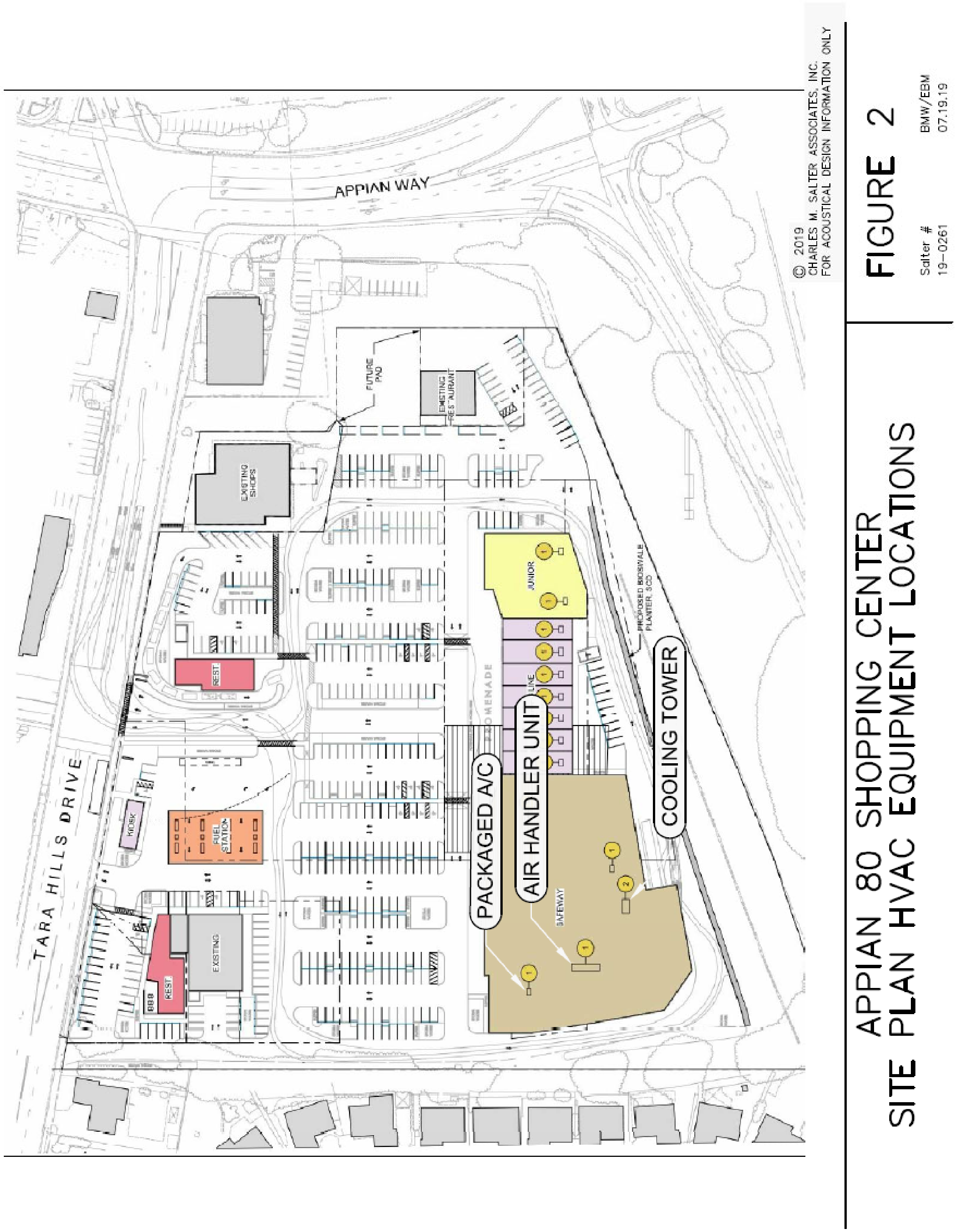

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FIGURE 2
Salter #
19-0261
BMW/EBM
07.19.19
APPIAN 80 SHOPPING CENTER
SITE PLAN HVAC EQUIPMENT LOCATIONS
APPIAN WAY
TARA HILLS DRIVE
FUTURE PAD
EXISTING RESTAURANT
EXISTING SHOPS
JUNIOR
PROPOSED BIOSWALE PLANTER, SCD
REST.
PROMENADE
LINE
KIOSK
FUEL STATION
EXISTING
REST
SAFEWAY
PACKAGED A/C
AIR HANDLER UNIT
COOLING TOWER

February 18, 2020

Angela DaRosa
Raney Planning & Management, Inc.
1501 Sports Drive Suite A
Sacramento, CA 95834

Transmitted via email: adarosa@raneymanagement.com

Subject: Changes in noise levels associated with revised building square footages for the proposed Pinole Square Redevelopment project in Pinole, California.

Dear Angela,

Bollard Acoustical Consultants, Inc. (BAC) previously prepared a noise and vibration assessment for the Pinole Square Redevelopment project in Pinole, California (dated January 13, 2020). On February 12, 2020, it was brought to the attention of BAC that the project had revised square footages for a portion of the proposed buildings. In response to those changes, the project traffic consultant (TJKM Transportation Consultants) identified that, although the changes in square footage would result in a slight increase in new net trips, the increase would not change the conclusions presented in the project traffic impact analysis. In other words, the changes in building square footage and associated trips did not warrant a revision to the project traffic impact analysis. Similarly, noise levels associated with a slight increase in net trips would not be appreciable and would not change the conclusions presented in the noise and vibration assessment previously prepared by BAC. Based the information above, a revision to the noise and vibration study prepared by BAC dated January 13, 2020 would not be warranted.

Please contact me at (916) 663-0500 or dariog@bacnoise.com if you have any questions or require additional information.

Sincerely,

Dario Gotchet
Consultant

APPENDIX G

TRANSPORTATION IMPACT STUDY

Pinole Square

Transportation Impact Study

City of Pinole, California

February 21, 2020

TJKM

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TJKM

Tables

Figures

Appendices

EXECUTIVE SUMMARY

This report summarizes the results of the Transportation Impact Study (TIS) conducted for a proposed mixed use development at Pinole Square Shopping Center on Tara Hills Drive. The TIS evaluated potential transportation impacts resulting from the proposed project based on City of Pinole, Contra Costa Transportation Agency (CCTA) and Caltrans significance criteria. Traffic operations were evaluated at four study intersections during the weekday morning (a.m.) peak hour and evening (p.m.) peak hour under four study scenarios. The study intersections were evaluated under *No Project* and *plus Project* scenarios for Existing and Cumulative Conditions.

Project Trip Generation

The project consists of updating or replacing many of the stores in an existing 93,193 square feet shopping center. The new shopping center will have 105,149 square feet including a gasoline station and a drive through restaurant. A total of 11,854 square feet remains unaltered as a part of the new development. The proposed project is expected to generate a net increase of approximately 87 weekday a.m. peak hour trips (44 inbound trips, 43 outbound trips), and 150 weekday p.m. peak hour trips (76 inbound trips, 74 outbound trips), with a total of 2,919 additional daily trips.

It is noted that the existing and proposed project square footage was adjusted slightly after the traffic calculations in this report were completed. TJKM has verified that these changes do not change the levels of service or queuing calculations at any of the study intersections and do not change any of the conclusions of this report.

Existing Conditions

Under this scenario, all of the study intersections are operating within acceptable jurisdictional standards of level of service (LOS) D/C or better during the a.m. and p.m. peak hours.

Existing plus Project Conditions

Project-generated traffic was added to existing conditions volumes at the study intersections, under this scenario. With the addition of project traffic, all of the study intersections are operating within acceptable jurisdictional standards of level of service (LOS) D/C or better during the a.m. and p.m. peak hours.

Cumulative Conditions

Under this scenario, all of the study intersections are operating within acceptable jurisdictional standards of level of service (LOS) D/C or better during the a.m. and p.m. peak hours.

Cumulative plus Project Conditions

Project-generated traffic was added to cumulative conditions volumes at the study intersections, under this scenario. With the addition of project traffic, all of the study intersections are operating within acceptable jurisdictional standards of level of service (LOS) D/C or better during the a.m. and p.m. peak hours.

Pedestrian, Bicycle, and Transit Impacts

The proposed project does not conflict with any existing or planned pedestrian bicycle, or transit facilities in the vicinity of the project area.

Site Access and On-Site Circulation

Access to the site is provided via three locations on Tara Hills Drive, one through a signalized intersection, and the other two through right-in and right-out driveways. The site circulation works well for truck traffic with direct access to the back of Safeway and other stores on the site. Ample queue length is provided for vehicular traffic anticipated at the drive-through restaurant. The circulation around the gasoline station ensures no hindrance to the traffic approaching or exiting other stores and restaurants on the site in the event of a traffic back-up for fueling.

Queueing Analysis at Study Intersections

As per queueing analysis, sufficient storage length was observed for all study intersections.

Vehicle Miles Traveled (VMT)

Most of the trips for this project will be made by customers and shoppers. The project grows in daily and peak hour traffic but a commensurate reduction in traffic in similar locations such as other shopping centers in the region can be assumed. For these reasons State of California VMT guidelines indicate that locally serving neighborhood shopping centers produce impacts that are presumed to be not significant.

1.0 INTRODUCTION

This report summarizes the results of the Transportation Impact Study (TIS) for the proposed upgrade of a commercial and retail development at Pinole Square Shopping Center located on Tara Hills Drive in the City of Pinole.

1.1 Study Purpose

The purpose of the TIS is to evaluate the impacts on the transportation infrastructure due to the addition of the traffic from the proposed upgrade of the commercial and retail development, Pinole Shopping Center, located on Tara Hills Drive in the City of Pinole. The existing development totals an area of 93,193 square feet. Of the 93,193 square feet, two buildings comprising a total of 11,854 square feet (Shops 15E and Shop 16E) remain unaltered as a part of the new development. The proposed development upgrades the remaining 81,339 square feet of project area. The upgrade adds an additional 11,956 square feet of commercial/retail space post expansion resulting in a proposed total project area of 105,149 square feet.

The proposed development consists of 9,336 square feet of restaurant area (Shop 1, Drive-Through restaurant, and Shop 16E), 55,044 square feet of grocery store (Safeway), a gas station with 16 fueling positions, and 40,769 square feet of retail area (Shops 2E, 3E, and 15E, Junior Anchor, Shops 4-10, and Kiosk).

It should be noted that the existing project size and proposed project size were adjusted slightly (a decrease in 1,521 square feet for existing area, and an increase of 178 square feet for proposed area) after the traffic calculations in this report were completed. TJKM has verified that these changes do not change the levels of service or queuing calculations at any of the study intersections and do not change any of the conclusions of this report.

1.2 Study Intersections

TJKM evaluated traffic conditions at four study intersections during the a.m. and p.m. peak hours for a typical weekday. The peak periods observed were between 7:00-10:00 a.m. and 4:00-7:00 p.m. The highest single one hour recorded for each peak period was used in the analysis. The study intersections and associated traffic controls are as follows:

1. Tara Hills Drive at project entrance (Signalized)
2. Appian Way and Tara Hills Drive (Signalized)
3. Appian Way and I-80 WB Ramps (Signalized)
4. Appian Way and I-80 EB (Signalized)

Figure 1 illustrates the study intersections and the vicinity map of the proposed project. **Figure 2** shows the proposed project site plan.

1.4 Analysis Scenarios

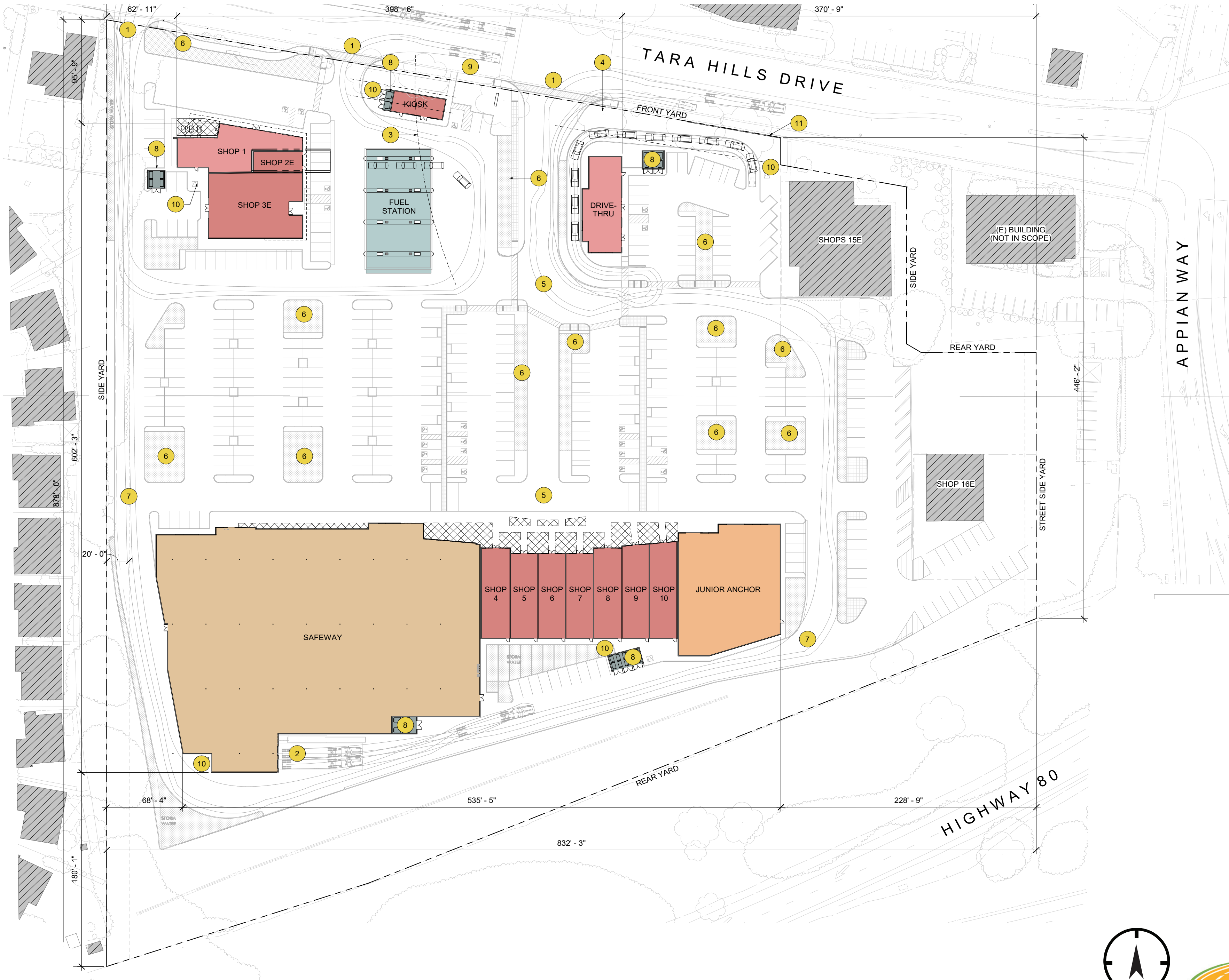
This study assess potential impacts based on the following four scenarios:

- **Existing Conditions** – This scenario describes existing transportation conditions relevant to the study area, including characteristics of key roadways and transit service, and existing conditions for walking and bicycling.
- **Existing plus Project Conditions** – This scenario describes the anticipated effects of the proposed project on Existing Conditions, including the addition of traffic from the proposed project to study intersections.
- **Cumulative No Project Conditions** – This scenario describes anticipated transportation conditions in 2040 using a growth rate based on the volumes obtained from the CCTA 2040 travel demand model.
- **Cumulative Plus Project Conditions** – This scenario describes anticipated transportation conditions in 2040 that includes the proposed project. Cumulative impacts resulting from the project are assessed based on the net change from Cumulative No Project Conditions.

Figure 1: Vicinity Map

049-034

Figure 2: Site Plan



2.0 STUDY METHODOLOGY

This chapter discusses the level of service analysis methodology for study intersections and criteria used to identify significant impacts.

2.1 Level of Service Analysis Methodology

LOS is a qualitative measure that describes operational conditions as they relate to the traffic stream and perceptions by motorists and passengers. The LOS generally describes these conditions in terms of such factors as speed and travel time, delays, freedom to maneuver, traffic interruptions, comfort, convenience, and safety. The operational LOS are given letter designations from A to F, with A representing the best operating conditions (free-flow) and F the worst (severely-congested flow with high delays). Intersections generally are the capacity-controlling locations with respect to traffic operations on arterial and collector streets. **Table 1** summarizes the relationship between the control delay and LOS for signalized intersections.

Table 1: Level of Service Definitions for Signalized Intersections

Level of Service	Description
A	Very low control delay, up to 10 seconds per vehicle. Progression is extremely favorable, and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.
B	Control delay greater than 10 and up to 20 seconds per vehicle. There is good progression or short cycle lengths or both. More vehicles stop causing higher levels of delay.
C	Control delay greater than 20 and up to 35 seconds per vehicle. Higher delays are caused by fair progression or longer cycle lengths or both. Individual cycle failures may begin to appear. Cycle failure occurs when a given green phase does not serve queued vehicles, and overflow occurs. The number of vehicles stopping is significant, though many still pass through the intersection without stopping.
D	Control delay greater than 35 and up to 55 seconds per vehicle. The influence of congestions becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volumes. Many vehicles stop, the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Control delay greater than 55 and up to 80 seconds per vehicle. The limit of acceptable delay. High delays usually indicate poor progression, long cycle lengths, and high volumes. Individual cycle failures are frequent.

F	Control delay in excess of 80 seconds per vehicle. Unacceptable to most drivers. Oversaturation, arrival flow rates exceed the capacity of the intersection. Many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to higher delay.

Source: Highway Capacity Manual

2.2 Significant Impact Criteria

City of Pinole Traffic Impact Criteria

City of Pinole LOS standard specify that the minimum acceptable operation for signalized intersections is LOS D or better. The Pinole General Plan mentions increase in daily volumes on San Pablo Avenue, Appian Way and Pinole Valley Road would slowly begin to exceed the capacity of roadway due to growth in adjacent areas.

Caltrans Traffic Impact Criteria

Per Caltrans guidelines, Caltrans endeavors to maintain a target LOS at the transition between LOS "C" and LOS "D" on State highway facilities, however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State highway facility is operating at less than the appropriate target LOS, the existing Measure of Effectiveness should be maintained.

For the purposes of this report, LOS thresholds were considered to be LOS D for those within both the City and Caltrans jurisdiction.

Pedestrian & Bicycle Impact Criteria

Significant impacts to pedestrian and bicycle circulation would be considered potentially significant if the project would:

- Creates a hazardous condition that currently does not exist for pedestrians or bicyclists; or otherwise interferes with pedestrian accessibility to the project and adjoining areas; or
- Conflicts with an existing or planned pedestrian or bicycle facility; or
- Conflicts with policies related to bicycle and pedestrian activity adopted by the City of Pinole.

Transit Impact Criteria

Project impacts to transit would be considered potentially significant if:

- The project conflicts with existing or planned transit services; or
- The project creates demand for public transit services above the capacity that is provided or planned; or
- The project conflicts with transit policies adopted by the City of Pinole or CCTA.

3.0 EXISTING CONDITIONS

This section describes existing conditions in the immediate project site vicinity, including roadway facilities, bicycle and pedestrian facilities, and available transit service. In addition, existing traffic volumes and operations are presented for the study intersections, including the results of LOS calculations.

3.1 Existing Setting and Roadway System

Regional roadway access to the proposed mixed use development is provided via I-80. Access to the project site is provided via Tara Hills Drive, a four-lane arterial street that connects to regionally significant arterials of Appian Way on the east and San Pablo Avenue on the west. Descriptions of the existing roadways are as follows:

Tara Hills Drive is four lane east-west roadway parallel to I-80 that extends between Appian Way and San Pablo Avenue. No bicycle lanes are provided in the immediate vicinity of the project site. The sidewalk network on Tara Hills Drive provides good connection to the project site from nearby areas. Tara Hills Drive is a designated arterial in the City of Pinole with roughly 1,182 a.m. and 1,000 p.m. peak hour vehicle trips near the project site. Tara Hills Drive borders the project site to the north and connects the project site with several local streets such as Kilkenny Way, Shawn Drive, Canyon Drive, etc. apart from Appian Way and San Pablo Avenue. The speed limit on the road is 30 miles per hour.

Appian Way is four lane north-south roadway perpendicular to I-80 that extends between San Pablo Avenue to the north and San Pablo Dam Road in El Sobrante to the south beyond the southern border of Pinole City. The bicycle network on Appian Way begins from the intersection of Appian Way and Mann Drive and extends north but does not provide connections to the project site. The sidewalk network on Appian Way connects to Tara Hills Drive and provides good connection to the project site. Appian Way is designated as an arterial of regional significance in the City of Pinole. Appian Way lies to the east of the project site with a speed limit of 35 miles per hour. A speed limit of 25 miles per hour is also posted for a school zone on this roadway.

Canyon Drive is a two lane east-west local street which connects to several residences on the east of the project side. The sidewalk network on Canyon Drive connects to Tara Hills Drive and provides good connection to the project site. There are no bike lanes on this street. The speed limit on Canyon Drive is 25 miles per hour.

I-80 is an east-west, eight-lane freeway with four mixed-flow lanes in each direction in the vicinity of the project. I-80 is located to the south of the project site and provides regional freeway access between San Francisco on the west and Sacramento and beyond on the east. Nearby, it connects with SR-4 to the north. Access from I-80 to the project site is provided via eastbound and westbound on and off ramps at Appian Way.

3.2 Existing Pedestrian Facilities

Walkability is defined as the ability to travel easily and safely between various origins and destinations without having to rely on automobiles or other motorized travel. The ideal "walkable" community includes wide sidewalks, a mix of land uses such as residential, employment, and shopping opportunities, a limited number of conflict points with vehicle traffic, and easy access to transit facilities and services. Pedestrian facilities are comprised of crosswalks, sidewalks, pedestrian signals, and off-street paths, which provide safe and convenient routes for pedestrians to access destinations such as institutions, businesses, public transportation, and recreation facilities.

The existing sidewalk network provides good connection to the project site from all nearby areas. All study intersections are signalized and are well equipped with marked crosswalks, push buttons, and pedestrian countdown heads. Existing pedestrian facilities in the study area are shown in **Figure 3**. Existing peak-hour pedestrian volumes at each study intersection are provided in **Appendix A**.

3.3 Existing Bicycle Facilities

The 2018 draft Bicycle and Pedestrian Plan Update by Contra Costa Transportation Authority describes the following classes of bicycle infrastructure described below-

- **Shared-Use Path (Class I Bikeway)**: Bike paths provide a completely separate right-of-way that is designated for the exclusive use of people riding bicycles and walking with minimal cross-flow traffic. Such paths are often located along creeks, canals, and rail lines. Class I Bikeways can also offer opportunities not provided by the road system by serving as both recreational areas and desirable commuter routes. This City of Pinole currently has approximately 1.8 miles of existing Class I bikeways with additional Class I bikeways proposed in the future as per the City of Pinole General Plan.
- **Bike Lane (Class II Bikeway)**: Using special lane markings, pavement legends, and signage, bike lanes provide designated street space for bicyclists, typically adjacent to the outer vehicle travel lanes. This City of Pinole currently has approximately one mile of existing Class II bike lanes with additional Class II bike lanes proposed in the future as per the City of Pinole General Plan.
- **Buffered Bicycle Lane (Class II Bikeway)**: Buffered bike lanes increase separation through painted buffers between vehicle lanes and/or parking, and green paint at conflict zones (such as driveways or intersections). This increased separation is most often added along medium volume collectors or arterials. Buffered bike lanes are often used where full vertical separation is not feasible, for example, where on-street parking or frequent driveways would block the visibility of cyclists to motorists. There are currently no existing buffered Class II bikeways in the City of Pinole.
- **Bike Route (Class III Bikeway)**: Bike routes provide enhanced mixed-traffic conditions for bicyclists through signage, sharrow striping, and/or traffic calming treatments, and provide continuity to a bikeway network. Bike routes are typically designated along gaps between bike

trails or bike lanes, or along low-volume, lowspeed streets. There are currently no existing Class III bike routes in the City of Pinole.

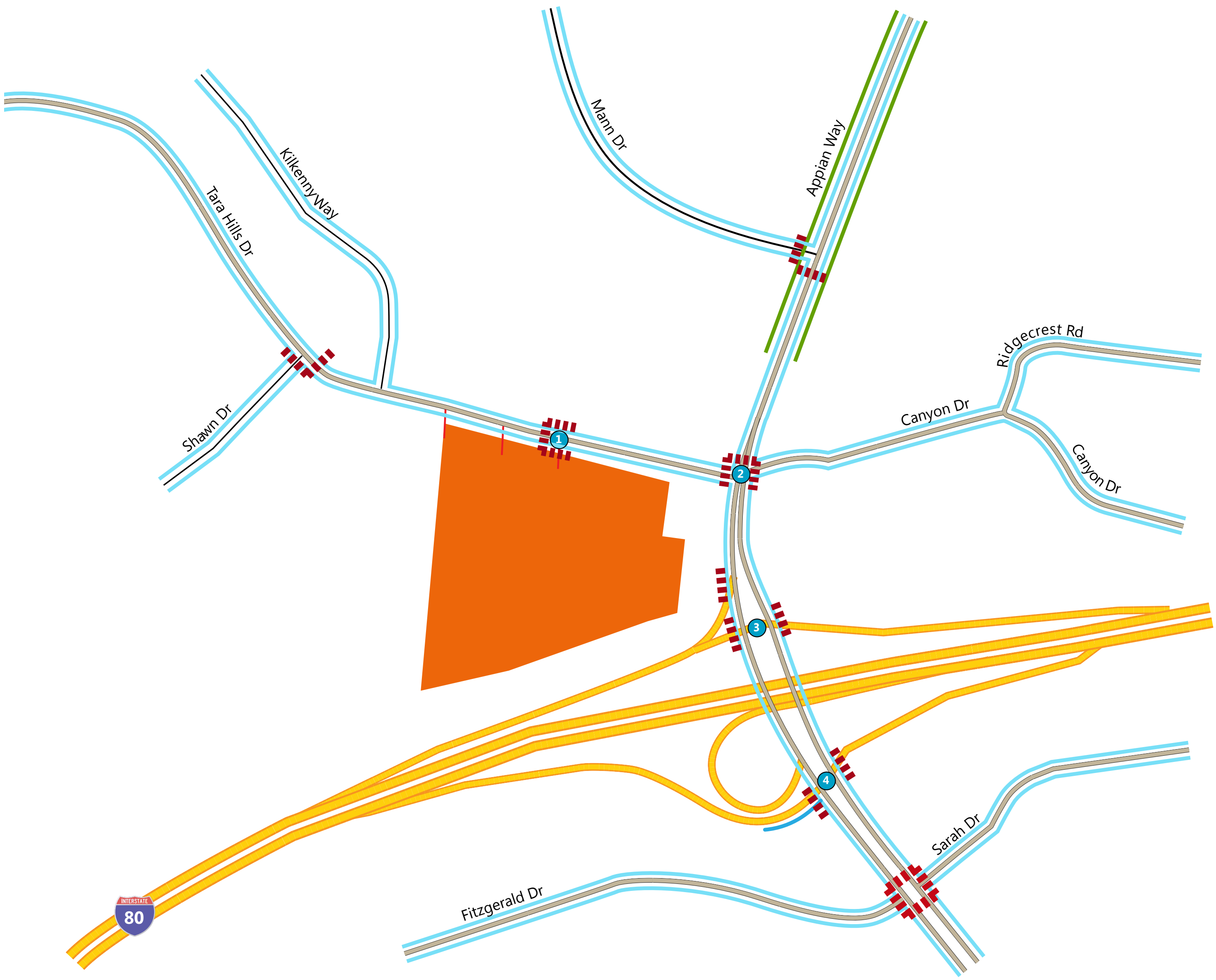
- **Bicycle Boulevards (Class III Bikeway)**: These bike routes are further enhanced by encouraging slower speeds and discouraging non-local vehicle traffic using traffic diverters, chicanes, traffic circles, and speed tables. They are always located on low auto volume and low speed residential streets. Bicycle boulevards can also feature special wayfinding signage to nearby destinations or other bikeways. They are an important element of the low-stress CBN and often provide important safe routes to school connections for children. There are currently no existing Class III bicycle boulevards in the City of Pinole.
- **Protected Bikeway (Class IV Bikeway)**: Also referred to as cycle tracks or separated bikeways, and are set aside for the exclusive use of bicycles and physically separated from vehicle traffic. Separated Bikeways were recently adopted by Caltrans in 2015. Types of separation may include, but are not limited to, grade separation, flexible posts, physical barriers, or on-street parking. The City of Pinole currently has no existing Class IV bikeways.

There is no existing bicycle infrastructure in the immediate vicinity of the project site. The only bicycle infrastructure in the vicinity of the project site is a Class II bike lane which begins 200 feet south of Appian Way and Mann Drive and continues north without providing any connection to the project site. This bike lane lies about 0.25 miles away from the project entrance. The existing bicycle facilities in the study area are shown in **Figure 3**. Existing peak-hour traffic bicycle volumes at each study intersection are provided in **Appendix A**.

3.4 Existing Transit Facilities

Bus service in the City of Pinole is provided by WestCAT, which operates local fixed routes, Express and transbay routes, and Paratransit within its service area. Five local fixed routes, 16, 17, 18, 19, and C3-Connection serve the Pinole residential and commercial areas. The closest bus stop to the project entrance is about 0.2 miles away on Appian Way, serving bus route 17. At the present, there exists inactive WestCAT bus stops on Tara Hills drive at the project area which the agency will consider activating in the future based on ridership turnout. The existing transit facilities in the study area are shown in **Figure 4**.

Figure 3: Existing Pedestrian and Bicycle Facilities



LEGEND

- Project Site
- Study Intersection
- Existing Sidewalks
- Crosswalks
- Existing Class II Bike Lane

Figure 4: Existing Transit Facilities

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3.5 Existing Peak Hour Traffic Volumes And Lane Configurations

The existing operations of the study intersections were evaluated for the highest one-hour volumes during weekday morning and evening peak periods. Recent turning movement counts for vehicles, bicycles, and pedestrians were conducted during the weekday a.m. peak period (7:00-9:00 a.m.) and p.m. peak period (4:00-6:00 p.m.) at the study intersections on typical weekdays in June of 2019 when school was in session.

Figure 5 illustrates the existing lane geometry and traffic controls at each of the study intersections. **Figure 6** illustrates the existing a.m. and p.m. peak hour vehicle turning movement volumes at the study intersections. **Appendix A** includes all data sheets and count dates for the collected vehicle, bicycle, and pedestrian counts.

3.6 Intersection Level of Service Analysis – Existing Conditions

The existing operations of the study intersections were evaluated for the highest one-hour volume during the weekday morning and evening peak periods. The a.m. and p.m. peak hour turning movement counts were conducted on typical weekdays in June of 2019. The a.m. and p.m. peak periods observed were between 7:00-9:00 a.m. and 4:00-6:00 p.m. Turning movement count sheets are in **Appendix A.**

Existing intersection lane configurations and peak-hour turning movement volumes were used to calculate the level of service (LOS) at the study intersections during peak hours. **Figure 5** illustrates the existing lane geometry, traffic controls, and turning movement volumes at the study intersections. Existing Conditions intersection LOS worksheets are provided in **Appendix B**. The results of the LOS analysis for Existing Conditions are summarized in **Table 2**.

City Intersections

- The intersection of Tara Hills Drive at project entrance operates acceptably at LOS B in both the a.m. and p.m. peak hours.
- The intersection of Appian Way and Tara Hills Drive operates at LOS D in the a.m. peak hour and LOS C in the p.m. peak hour.

Caltrans Intersections

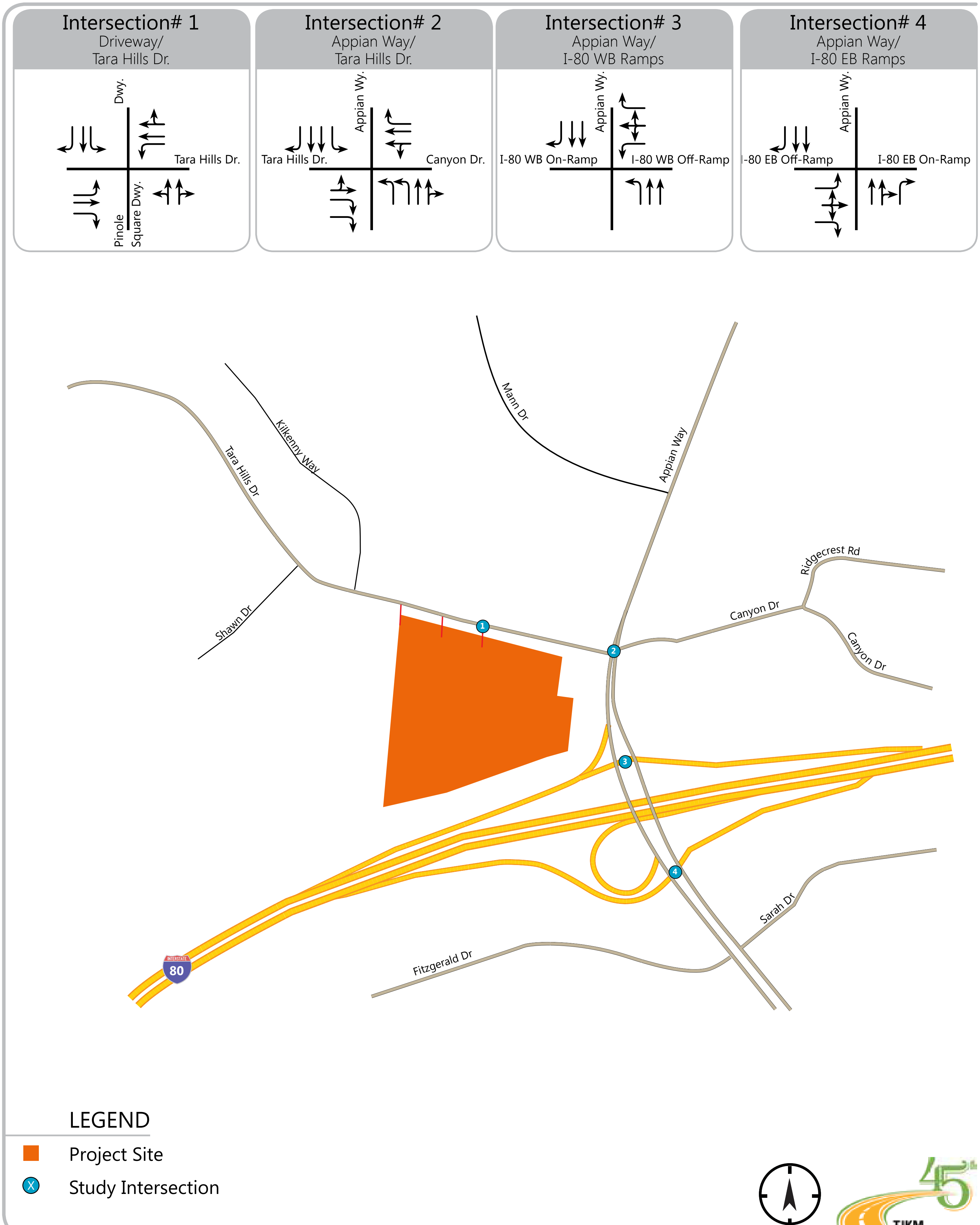
- The intersection of Appian Way and I-80 WB Ramps operates acceptably at LOS D in the a.m. peak hour and LOS C in the p.m. peak hour.
- The intersection of Appian Way and I-80 EB Ramps operates acceptably at LOS A in both the a.m. and p.m. peak hour.

Table 2: Intersection Level of Service Analysis – Existing Conditions

ID #	Intersection	Control	Peak Hour	Existing Conditions		
				LOS[1]	Average Delay[2]	V/C Ratio[3]
1	Tara Hills Drive at project entrance	Signal	A.M.	B	12.1	0.44
			P.M.	B	15.5	0.42
2	Appian Way and Tara Hills Drive	Signal	A.M.	D	37.5	0.61
			P.M.	C	34.4	0.57
3	Appian Way and I-80 WB Ramps	Signal	A.M.	D	36.6	0.87
			P.M.	C	31.4	0.74
4	Appian Way and I-80 EB Ramps	Signal	A.M.	A	8.6	0.54
			P.M.	A	7.8	0.63

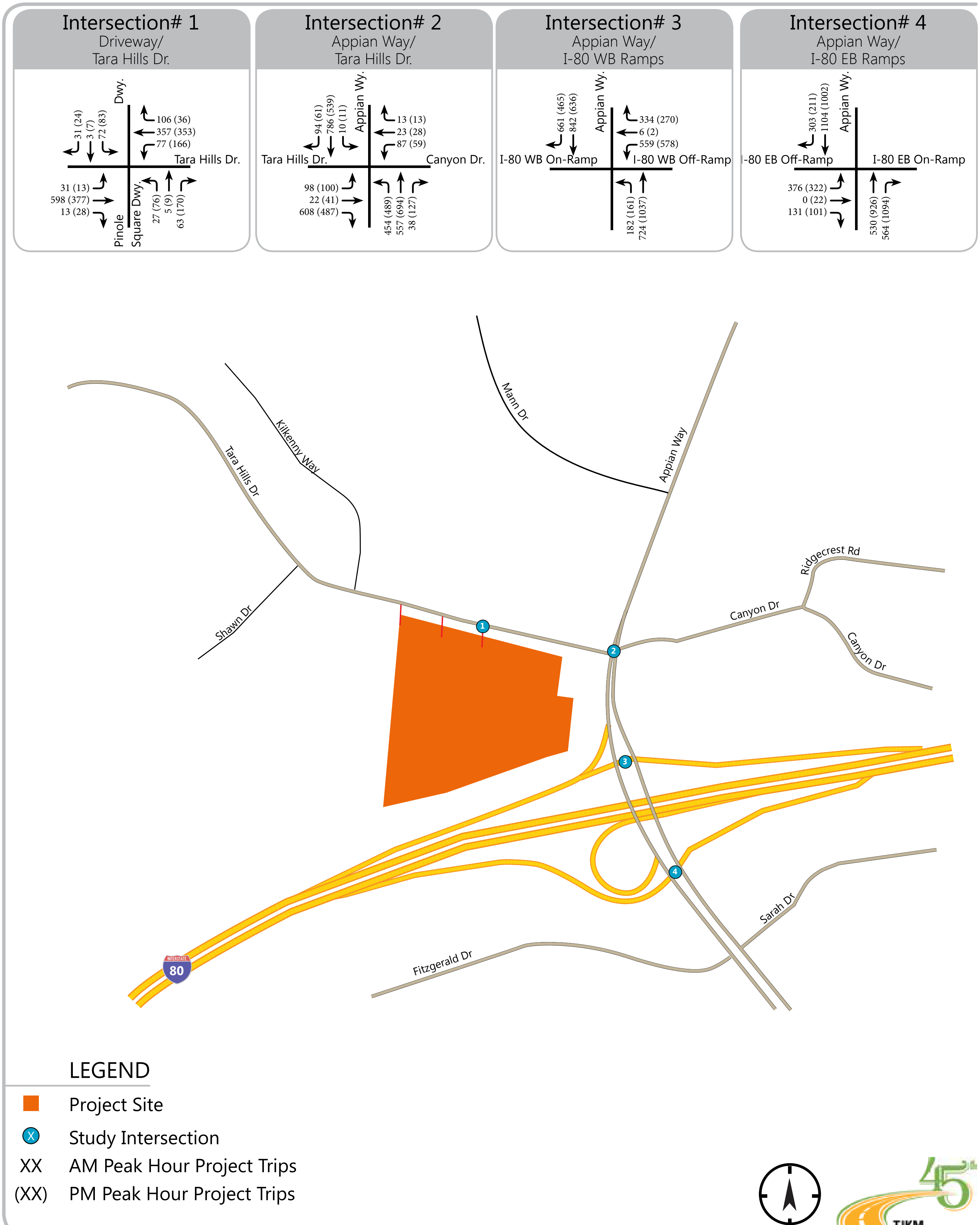
Notes:
1. LOS – Level of Service
2. Delay – Whole intersection weighted average control delay expressed in seconds per vehicle for signalized intersections
3. V/C ratio- Volume to Capacity ratio

Figure 5: Existing Lane Geometry



049-034

Figure 6: Existing Conditions Volumes



4.0 PROJECT CONDITIONS

The impacts of the proposed project on the multi-modal transportation system are discussed in this chapter. Motor vehicle traffic impacts are assessed based on the volume of motor vehicle traffic generated by the project. A comparison of intersection LOS with and without the project is conducted to assess potential impacts.

The volume of peak-hour motor vehicle traffic added to the roadway system and study intersections is forecasted using a three-step process.

- Trip Generation – Forecasts the amount of traffic added to the roadway network,
- Trip Distribution – Predicts the direction of travel to and from the project site
- Trip Assignment – The new vehicle trips are assigned to specific street segments and intersection turning movements

4.1 Project Vehicle Trip Generation

TJKM developed estimated project trip generation for the proposed project based on published trip generation rates from the *Institute of Transportation Engineers' (ITE) publication Trip Generation (10th Edition).* TJKM used published trip rates for the ITE land use Shopping Center (ITE Code 820). Published trip rates from land use of Gasoline/Service Station (ITE Code 944) were utilized to obtain project trips for the proposed Safeway gasoline station, and the trip rate from land use of Fast-Food Restaurant with Drive-Through Window (ITE Code 934) were utilized to obtain project trips for drive-through restaurant.

It should be noted that trip generation calculations do not include Shops 15E and Shop 16E which remain unaltered as a part of the proposed project. Existing traffic volumes from these buildings do use the main driveway and are included in both the existing and future scenarios based on existing field counts. These two buildings total 11,854 square feet.

Table 3 shows the trip generation was based on the difference between the number of vehicle trips generated by the proposed building areas and the existing building areas. The proposed project is expected to generate a net increase of approximately 87 weekday a.m. peak hour trips (44 inbound trips, 43 outbound trips), and 150 weekday p.m. peak hour trips (76 inbound trips, 74 outbound trips), with a total of 2,919 additional daily trips.

Also, the existing project size and proposed project size were adjusted slightly (a decrease in 1,521 square feet for existing area, and an increase of 178 square feet for proposed area) after the traffic calculations in this report were completed. TJKM has verified that these changes do not change the levels of service or queuing calculations at any of the study intersections and do not change any of the conclusions of this report.

Table 3: Project Vehicle Trip Generation Forecast

Land Use	*ITE Code*	Size	*Daily*		*AM Peak Hour*						*PM Peak Hour*					
			Rate	*Trips*	*Rate*	*In %*	*Out %*	*In*	*Out*	*Total*	*Rate*	*In %*	*Out %*	*In*	*Out*	*Total*
EXISTING BUILDING AREAS																
Shopping Center[1] (Excludes parcel 15e+16e)	**820**	82,860	**63.85**	**5,290**	**2.33**	62	38	120	73	**193**	**5.71**	48	52	227	246	**473**
Pass-By Trip Reduction (PM Peak Hour-34%)[2]														-77	-84	-161
Total Vehicle Trips				**5,290**				120	73	**193**				150	162	**312**
Total Vehicle Trips				5,290				120	73	**193**				150	162	**312**
PROPOSED BUILDING AREAS																
Shopping Center[1] (See note 9)	**820**	89,190 sq. ft.	**62.36**	**5,562**	**2.20**	62	38	122.0	74.4	**196.4**	**5.6**	48.0	52.0	240	259	**499**
Pass-By Trip Reduction (PM Peak Hour-34%)[2]														-81	-89	-170
Total Trips for Shopping Center				**5,562**				122.0	74.4	**196.4**				159	170	**329**
Gasoline/Service Station[3]	**944**	16 Fueling Positions	**172.01**	**2,752**	**10.28**	50	50	82	82	**164**	**14.03**	50	50	112	112	**224**
Internal Trip Reduction (AM Peak Hour-50%, PM Peak Hour-50%)[4]				-1,376				-41	-41	-82				-56	-56	-112
Pass-by Trip Reduction (AM Peak Hour-58%, PM Peak Hour-42%)[5]								-24	-24	-48				-24	-23	-47
Total Trips for Gasoline Station				**1,376**				17	17	**34**				32	33	**65**
Drive Through Restaurant[6]	**934**	3,005 sq. ft.	**470.95**	**1,413**	40.2	51.0	49.0	62	59	**121**	33	52	48	51	47	**98**
Internal Trip Reduction (AM Peak Hour-10%, PM Peak Hour-10%)[7]				-141.3				-6	-6	-12				-5	-5	-10
Pass-by Trip Reduction (AM Peak Hour-49%, PM Peak Hour-21%)[8]								-31	-29	-59				-11	-9	-20
Total Trips for Drive Through Restaurant				**1,272**				25	24	**50**				35	33	**68**
Total Vehicle Trips				**8,210**				164	116	**280**				226	237	**462**
TRIP DIFFERENCE																
Total Vehicle Trips From Proposed Building Areas				**8,210**				164	116	**280**				226	237	**462**
Total Vehicle Trips From Existing Building Areas				**5,290**				120	73	**193**				150	162	**312**
Net New Vehicle Trips (Proposed-Existing)				**2,919**				44	43	**87**				76	74	**150**

Source - Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition, 2017.

[1] Shoping Center (ITE Land Use Code 820) fitted curve equations are based upon number of thousand square feet gross leasable area. Fitted curve equation for Daily: Ln(T)=0.68 Ln(X)+5.57;
AM Peak: T=0.50(X)+151.78; PM Peak: Ln(T)=0.74 Ln(X)+2.89. Where T=Average Vehicle Trip Ends; X=Land Use Size in ksf (One Thousand Square Feet).

[2] ITE Pass-By reduction rate of 34% in the PM peak hour for Retail Land Use.

[3] Gasoline/Service Station (ITE Land Use Code 944) vehicle trip rates are based upon number of fueling positions.

[4] Internal trip reduction of 50% applied to reflect internal trips between the Safeway Grocery Store and Safeway Gasoline Pump.

[5] ITE Pass-By reduction rate of 58% in the AM peak hour and 42% in the PM peak hour was applied to internal trips for From Safeway Grocery Store to Safeway Gasoline Pump.

[6] Drive Through Restaurant or Fast-Food Restaurant with Drive-Through Window (ITE Land Use Code 934) vehicle trip rates are based upon number of thousand square feet gross leasable area.

[7] Internal trip reduction of 10% applied to reflect internal trips between Shopping Center and Drive Through Restaurant.

[8] ITE Pass-By reduction rate of 49% in the AM peak hour and 21% in the PM peak hour for Drive Through Restaurant.

[9] Site Plan shows total of 105,149 square feet. Excluding sites 15e+16e (11,854 square feet), service station kiosk (1,100 square feet), and Drive-Through (3,005 square feet) yields 89,190 square feet.

[10] It should be noted that the existing project area was reduced by 1,521 square feet (resulting in 81,339 square feet of analysis area), and the proposed project area increased by 178 square feet (resulting in 89,368 square feet of analysis area) post completion of traffic analysis of this report. However, these changes do not change the conclusions of the Traffic Impact Analysis.

4.2 Project Vehicle Trip Distribution and Assignment

Trip distribution is a process that determines in what proportion vehicles would be expected to travel between the project site and various origins and destinations outside the project study area and also determines the various routes that vehicles would take from the project site to each destination using the calculated trip distribution. Trip distribution assumptions for the proposed project were developed based on existing travel patterns, and knowledge of the study area.

Figure 7 illustrates the predicted distribution of project vehicle trips and **Figure 8** illustrates the anticipated trip assignment at each study intersection, based on existing travel patterns in the area. The assigned project trips were then added to traffic volumes under Existing Conditions to generate Existing plus Project Conditions traffic volumes.

4.3 Traffic Impact Findings – Existing plus Project Conditions

The analysis of Existing plus Project LOS at study intersections is based on the addition of project vehicle trips to existing traffic volumes. The anticipated volume of motor vehicle traffic under Existing plus Project Conditions during the a.m. and p.m. peak hours at each study intersection is illustrated on **Figure 9**. The intersection LOS analysis results for Existing plus Project Conditions are summarized in **Table 4**. Detailed calculation sheets for Existing plus Project Conditions are contained in **Appendix C**.

City Intersections

- The intersection of Tara Hills Drive at the project entrance operates acceptably at LOS B during both the a.m. and p.m. peak hours. Traffic impacts resulting from the project would be considered ***less than significant***.
- The intersection of Appian Way and Tara Hills Drive operates at LOS D in both the a.m. and p.m. peak hour. Traffic impacts resulting from the project would be considered ***less than significant***.

Caltrans Intersections

- The intersection of Appian Way and I-80 WB Ramps operates acceptably at LOS D in the a.m. peak hour and LOS C in the p.m. peak hour. Traffic impacts resulting from the project would be considered ***less than significant***.
- The intersection of Appian Way and I-80 EB Ramps operates acceptably at LOS A in both the a.m. and p.m. peak hour. Traffic impacts resulting from the project would be considered ***less than significant***.

Table 4: Intersection Level of Service Analysis – Existing plus Project Conditions

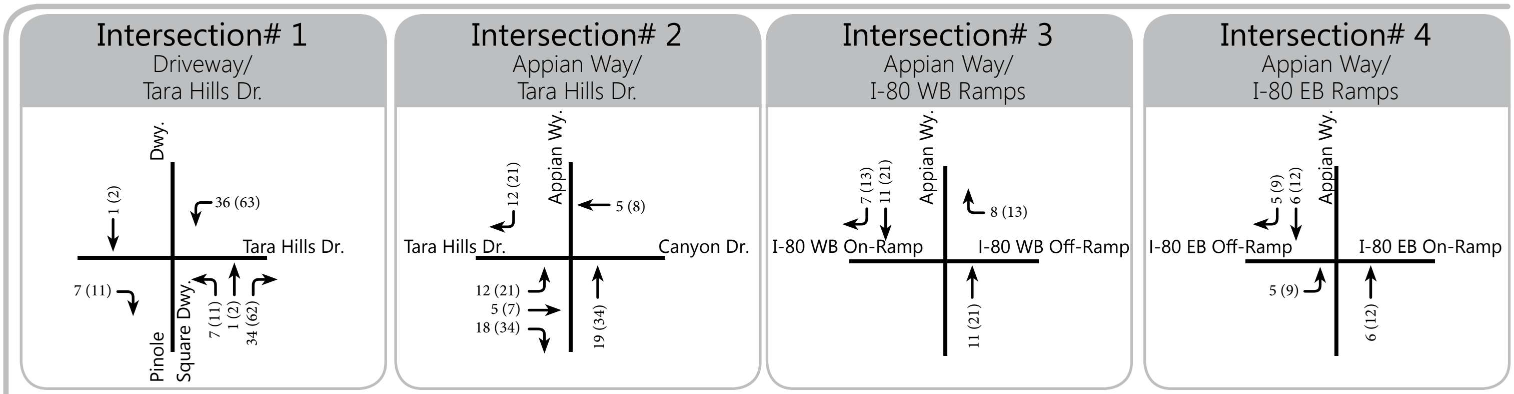
	Intersection	Control	Peak Hour	Existing Conditions			Existing Plus Project Conditions		
				LOS[1]	Average Delay[2]	V/C Ratio[3]	LOS[1]	Average Delay[2]	V/C Ratio[3]
1	Tara Hills Drive at project entrance	Signal	A.M.	B	12.1	0.44	B	14.0	0.47
			P.M.	B	15.5	0.42	B	18.2	0.49
2	Appian Way and Tara Hills Drive	Signal	A.M.	D	37.5	0.61	D	38.4	0.63
			P.M.	C	34.4	0.57	D	35.8	0.60
3	Appian Way and I-80 WB Ramps	Signal	A.M.	D	36.6	0.87	D	37.4	0.88
			P.M.	C	31.4	0.74	C	31.8	0.75
4	Appian Way and I-80 EB Ramps	Signal	A.M.	A	8.6	0.54	A	8.7	0.54
			P.M.	A	7.8	0.63	A	8.0	0.63

Notes:
1. LOS – Level of Service
2. Delay – Whole intersection weighted average control delay expressed in seconds per vehicle for signalized intersections
3. V/C ratio- Volume to Capacity ratio

Figure 7: Trip Distribution

049-034

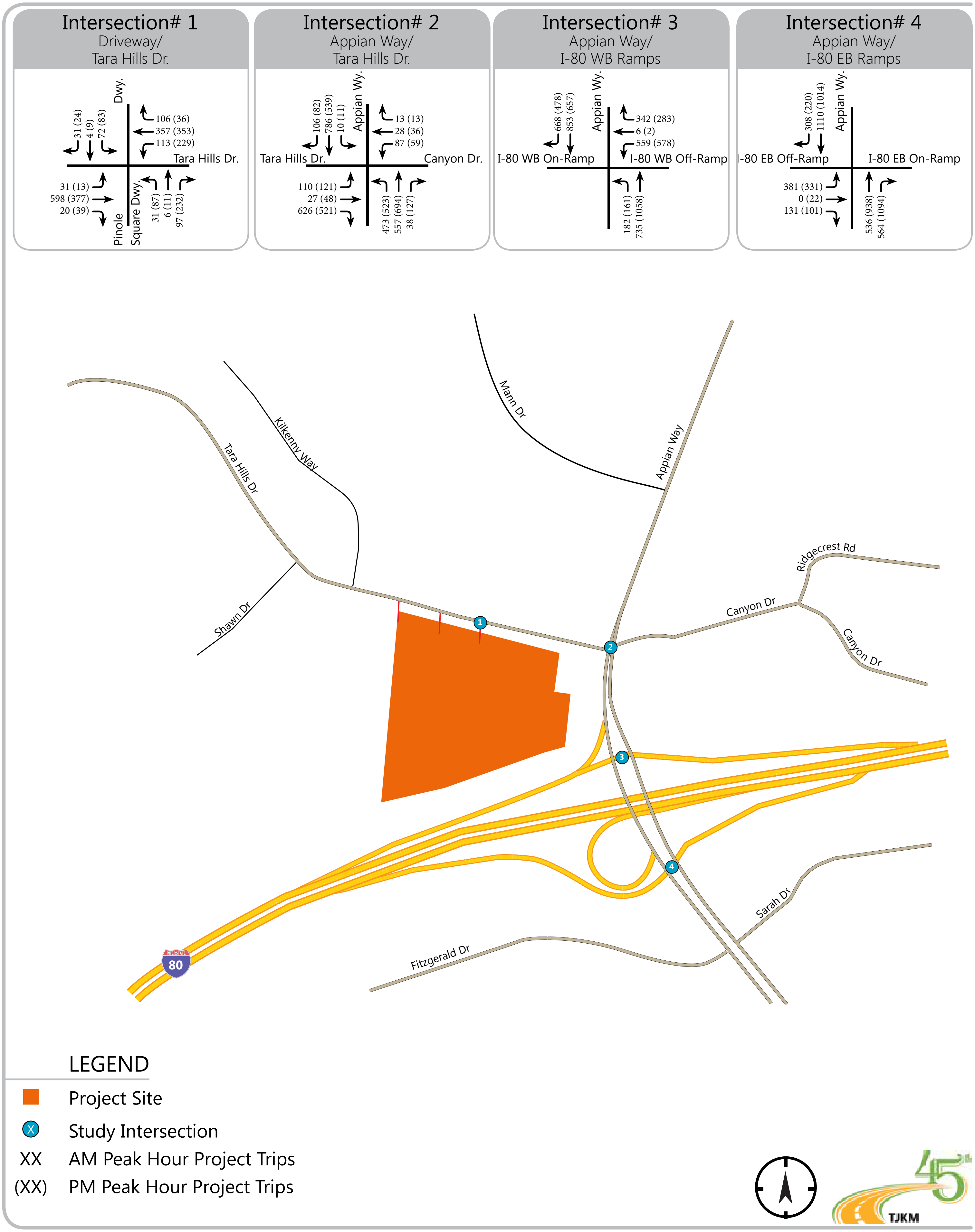
Figure 8: Trip Assignment



LEGEND

- Project Site
- Study Intersection
- XX AM Peak Hour Project Trips
- (XX) PM Peak Hour Project Trips

Figure 9: Existing Plus Project Condition Volumes



4.4 Pedestrian, Bicycle, and Transit Impact Findings

Pedestrian Impacts

There is a good sidewalk network which connects nearby locations to the project area. An impact to pedestrians occurs if the proposed project disrupts existing pedestrian facilities; or creates inconsistencies with planned facilities or adopted system plans, guidelines, policies, or standards. The proposed project would not conflict with an existing or planned pedestrian facility; nor would the project conflict with policies related to pedestrian travel adopted by the City of Pinole. The impact to pedestrian facilities is considered ***less than significant***.

Although there are no existing deficiencies in pedestrian connectivity and no significant impacts due to the proposed project, TJKM notes that the existing sidewalk fronting the Pinole Square is about six feet wide, which is less than the eight feet width recommended by authorities such as NACTO (National Association of City Transportation Officials).

Bicycle Impacts

There are no existing bike lanes in the immediate vicinity of the project area. As per the Circulation chapter in the Pinole General Plan, existing Class I and Class II bicycles facilities are planned in the vicinity of the project area on Appian Way. The addition of two right-in, right-out driveways offers bicyclists the opportunity to safely access the site. The shopping center also provides bike racks to encourage active transportation. The project is expected to add a few trips to the existing and planned facilities but is not anticipated to create a hazardous condition that currently does not exist for bicyclists; or otherwise interfere with bicycle accessibility to the project and adjoining areas; or conflict with an existing or planned bicycle facility; or conflict with policies related to bicycle activity adopted by the City of Pinole. Therefore, the project impact to bicycle facilities is ***less than significant***.

Transit Impacts

The closest bus stop is located approximately 0.2 miles away from the project entrance on Appian Way. This bus stop serves WestCAT route 16 and 17 which operate below capacity. Additional trips generated by the project can be accommodated by the existing transit service and is not anticipated to create significant demand for public transit services above the capacity that is provided or planned. WestCAT will consider activating the currently inactive bus stops on Tara Hills Drive near the project location in the future based on ridership turnout of the proposed project. The project would not conflict with transit policies adopted by the City of Pinole or WestCAT for their respective facilities in the study area. Therefore, impacts to transit service are expected to be ***less than significant***.

5.0 CUMULATIVE CONDITIONS

This section details provides an assessment of potential cumulative transportation impacts resulting from the project for the year 2040.

5.1 Cumulative Traffic Volumes with Growth Rate

TJKM forecasted cumulative volumes using an annual growth factor of 0.38 percent for the year 2040 based on the volumes obtained from the current version of the CCTA Travel Demand Model. The Cumulative plus Project traffic volumes were based on the trip generation, distribution and assignment as applied to the analysis of Existing plus Project Conditions.

The growth rate from 2018 to 2040 was calculated for four locations on Appian Way namely between Tara Hills Drive and I-80 WB Ramps, I-80 WB and EB Ramps, I-80 EB Ramps and Fitzgerald Drive, Fitzgerald Drive and Michael Drive. The average growth rate for the AM peak hour was found to be 0.38 percent and for PM peak hour was found to be 0.33 percent. The higher growth rate of 0.38 percent was assumed for both AM and PM peak hours for the project. The growth rate calculations are contained in **Appendix D**.

Figure 10 shows projected peak hour turning movement volumes at all of the study intersections for Cumulative No Project Conditions without the proposed project. **Figure 11** displays projected turning movement volumes at all the study intersections for Cumulative plus Project Conditions.

5.2 Cumulative Impact Findings with Proposed Project

The intersection LOS analysis results for Cumulative Conditions are summarized in **Table 5**. Detailed LOS reports for Cumulative No Project Conditions are contained in **Appendix E**. Detailed LOS reports for Cumulative plus Project Conditions are contained in **Appendix F**. The intersection LOS analysis results for Cumulative No Project and Cumulative plus Project Conditions are summarized in **Table 5**.

Based on the findings summarized above, cumulative traffic impacts resulting from the project would be considered ***less than significant***.

City Intersections

- The intersection of Tara Hills Drive at the project entrance operates acceptably at LOS B at both a.m. and p.m. peak hour. Traffic impacts resulting from the project would be considered ***less than significant***.
- The intersection of Appian Way and Tara Hills Drive operates at LOS D in both the a.m. and p.m. peak hour. Traffic impacts resulting from the project would be considered ***less than significant***.

Caltrans Intersections

- The intersection of Appian Way and I-80 WB Ramps at operates acceptably at LOS D in the a.m. and LOS C in the p.m. peak hour. Traffic impacts resulting from the project would be considered ***less than significant***.

- The intersection of Appian Way and I-80 EB Ramps operates acceptably at LOS A in both the a.m. and p.m. peak hour. Traffic impacts resulting from the project would be considered ***less than significant***.

Table 5: Intersection Level of Service Analysis – Cumulative Conditions

	Intersection	Control	Peak Hour	Cumulative Conditions			Cumulative Plus Project Conditions		
				LOS[1]	Average Delay[2]	V/C Ratio[3]	LOS[1]	Average Delay[2]	V/C Ratio[3]
1	Tara Hills Drive at project entrance	Signal	A.M.	B	12.9	0.47	B	14.9	0.50
			P.M.	B	16.6	0.45	B	19.4	0.52
2	Appian Way and Tara Hills Drive	Signal	A.M.	D	39.1	0.67	D	40.3	0.68
			P.M.	D	35.5	0.61	D	36.9	0.65
3	Appian Way and I-80 WB Ramps	Signal	A.M.	D	50.3	0.95	D	52.9	0.96
			P.M.	C	33.4	0.80	C	33.7	0.82
4	Appian Way and I-80 EB Ramps	Signal	A.M.	A	9.3	0.59	A	9.5	0.59
			P.M.	A	8.7	0.68	A	8.8	0.69

Notes:
1. LOS – Level of Service
2. Delay – Whole intersection weighted average control delay expressed in seconds per vehicle for signalized intersections.
3. V/C ratio- Volume to Capacity ratio

Figure 10: Cumulative Condition Volumes

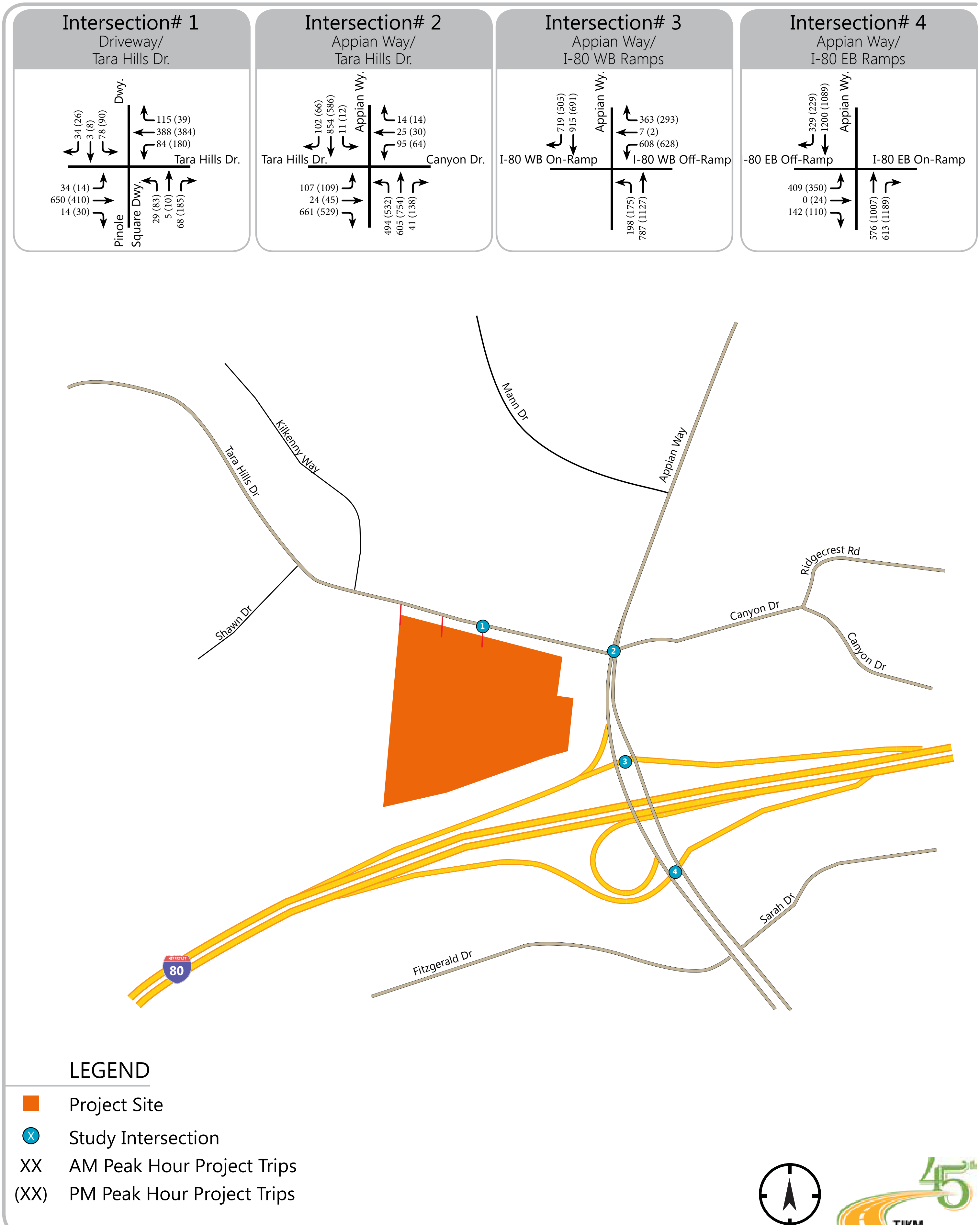
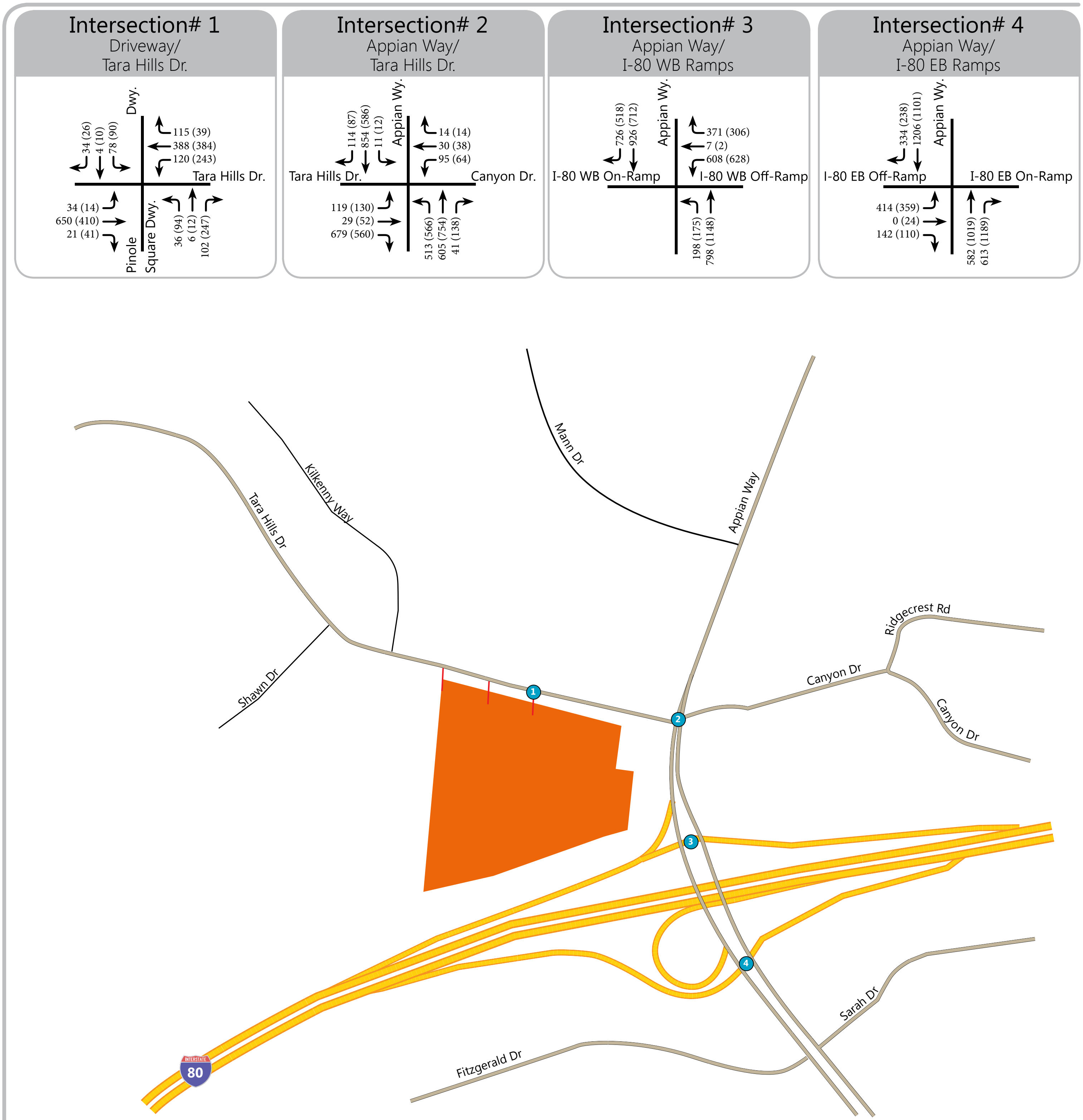


Figure 11: Cumulative Plus Project Condition Volumes



LEGEND

Project Site

Study Intersection

XX AM Peak Hour Project Trips

(XX) PM Peak Hour Project Trips

049-034

6.0 ADDITIONAL ANALYSIS

The following sections provide additional analyses of other transportation issues associated with the project site, including:

- Site access and onsite circulation;
- Queueing analysis;
- Vehicle miles traveled.

The analyses in these sections are based on professional judgment in accordance with the standards and methods employed by traffic engineers. Although operational issues are not considered CEQA impacts, they do describe traffic conditions that are relevant to describing the project environment.

6.1 Site Access and On-Site Circulation

This section analyzes site access and internal circulation for vehicles, pedestrians, and bicycles, based on the site plan presented in **Figure 2** (dated August 30, 2019). TJKM reviewed internal and external access for the project site for vehicles, pedestrians, and bicycles and on-site vehicle circulation. The site is accessible via three locations on Tara Hills Drive, one through a signalized intersection which features the main entrance into the site, and the other two through driveways which provide right in and right out access to the site. The site circulation works well for truck traffic with direct access to the back of Safeway and other stores on the site. A convenient access to the Safeway gasoline station is provided directly from Tara Hills Drive. In the event that traffic might back-up to fuel at the gasoline station, the circulation around the gasoline station ensures no hindrance to traffic approaching or exiting other stores and restaurants on the site. Ample queue length is provided for vehicular traffic anticipated at the drive-through restaurant. As per the site plan, a queue length of twelve vehicles is provided at the restaurant with a provision to accommodate an additional of three more vehicles prior to blocking any internal circulation isles. As per TJKM's experience, the estimated maximum vehicular traffic that will queue up at most drive-through restaurants is 15 vehicles. Given this, the queue length provided for the drive-through restaurant is adequate. Pedestrian access is provided via adequate sidewalks on Tara Hills Drive and within the project site. There is separate existing bicycle access to the site, although the mixed flow vehicle lanes accommodate bicycles.

6.2 Queuing Analysis at Study Intersections

TJKM conducted a vehicle queuing and storage analysis for all exclusive left turn or right-turn pockets at the study intersections where project traffic is added under Existing and Existing plus Project scenarios. The 95th percentile (maximum) queues were analyzed using the HCM 2000 Queue methodology contained in Synchro software. Detailed calculations are included in the LOS appendices corresponding to each analysis scenario. **Table 6** summarizes the 95th percentile queue lengths at the study intersections under Existing and Existing plus Project scenarios. None of the queues were observed to exceed capacity under existing and existing plus project conditions at any of the study intersections.

Table 6: 95th Percentile Queues at Turn Pockets Affected by Project Traffic

	Study Intersections	***Lane Group***	***Storage Length***	***Existing***		***Existing plus Project***		***Change***	
				AM	***PM***	***AM***	***PM***	***AM***	***PM***
1	Tara Hills Drive at Project Entrance	EBL	95	40	25	40	25	0	0
		WBL	235	70	135	100	215	30	80
2	Appian Way and Tara Hills Drive	NBL	640	500	580	520	630	20	50
		SBL	170	30	30	30	30	0	0
		SBR	150	25	0	35	20	10	20
3	Appian Way and I-80 WB Ramps	WBL	480	375	405	375	405	0	0
		WBR	240	130	215	140	240	10	25
		NBL	310	220	230	220	230	0	0
4	Appian Way and I-80 EB Ramps	EBL	380	155	130	160	130	5	0
		EBR	185	45	35	45	35	0	0

Notes: Storage length and 95th percentile queue is expressed in feet per lane, **Bold** indicates overflow.

6.3 Vehicles Miles Travelled

The Technical Advisory on Evaluating Transportation Impacts in CEQA from the Office of Planning and Research (OPR) (December 2018) states, *"If the project leads to a net increase in provision of locally-serving retail, transportation impacts from the retail portion of the development should be presumed to be less than significant. If the project consists of regionally-serving retail, and increases overall VMT compared to with existing uses, then the project would lead to a significant transportation impact."* A neighborhood shopping center typically ranges from 30,000 square feet to 125,000 square feet. Larger neighborhood centers, also known as community centers range from 125,000 square feet to 400,000 square feet, whereas regional shopping centers range from 400,000 square feet to 800,000 square feet. The Pinole Shopping Center anchored by Safeway, with a total area of 105,149 square feet is a locally-serving retail facility for Pinole residents and the communities outside of but near the City of Pinole north of I-80 - Tara Hills, Bayview and Montalvin Manor.

Most of the trips for this project will be made by customers and shoppers in these communities To the extent that this project grows in daily and peak hour traffic, one can assume that there will be a commensurate reduction in traffic in other similar locations in the region. This could either result from Pinole Square being located closer for its new customers or because it has newer and more attractive facilities.. The only other shopping center as anchored by a major grocery store near the project area, is the Pinole Vista Shopping Center on Fitzgerald Drive south of I-80. With a total area of 245,002 square feet, Pinole Vista is a community shopping center anchored by Lucky. Making trips for groceries to Pinole Vista Shopping Center requires community members, especially in the community of Tara Hills, to traverse local streets in Tara Hills to San Pablo Avenue, connect to Richmond Parkway, and finally reach Fitzgerald

Drive. The revitalization of the Pinole Square Shopping Center with the convenience of a major grocery store, several restaurants and other retail facilities will discourage these extra miles travelled to access grocery stores and retail facilities far off, and help reduce the VMT in the area. Given these factors and the guideline for retail redevelopment project mentioned in the OPR, the impacts from the redevelopment of Pinole Square Shopping Center will be less than significant.

Appendix A

Turning Movement Counts

Prepared by National Data & Surveying Services

Pinole Square Shopping Center Main Dwy & Tara Hills Dr

Peak Hour Turning Movement Count

ID: 19-08334-001
City: Pinole

Day: Monday
Date: 06/03/2019

PEAK HOURS		COUNT PERIODS
AM	07:45 AM - 08:45 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:00 PM - 05:00 PM	04:00 PM - 06:00 PM

Pinole Square Shopping Center Main Dwy — SOUTHBOUND

	Right	Thru	Left	U-Turn	Exiting
AM	31	3	72	0	142
NOON	0	0	0	0	0
PM	24	7	83	0	58
Lanes	0.5	0.5	1	0	

Tara Hills Dr — EASTBOUND

	AM	NOON	PM	Lanes
Exiting	415	0	453	
U-Turn	0	0	0	0
Left	31	0	13	0
Thru	598	0	377	3
Right	13	0	28	0

Tara Hills Dr — WESTBOUND

	Lanes	PM	NOON	AM
Right	0	36	0	106
Thru	3	353	0	357
Left	0	166	0	77
U-Turn	0	0	0	0
Exiting		630	0	733

Safeway Shopping Center Main Dwy — NORTHBOUND

	Exiting	U-Turn	Left	Thru	Right
Lanes		0	0	2	0
PM	201	0	76	9	170
NOON	0	0	0	0	0
AM	93	0	27	5	63

CONTROL

Signalized

	AM	NOON	PM
TEV	1383	0	1342
PHF	0.92		0.90

Total Vehicles (AM)

Approach	Left	Thru	Right
Southbound	72	3	31
Eastbound	31	598	13
Westbound	77	357	106
Northbound	27	5	63

Total Vehicles (Noon)

Approach	Left	Thru	Right
Southbound	N/A	N/A	N/A
Eastbound	N/A	N/A	N/A
Westbound	N/A	N/A	N/A
Northbound	N/A	N/A	N/A

Total Vehicles (PM)

Approach	Left	Thru	Right
Southbound	83	7	24
Eastbound	13	377	28
Westbound	166	353	36
Northbound	76	9	170

Bikes (AM)

Approach	Left	Thru	Right
Southbound	0	0	0
Eastbound	0	1	0
Westbound	0	0	0
Northbound	0	0	0

Bikes (NOON)

Approach	Left	Thru	Right
Southbound	N/A	N/A	N/A
Eastbound	N/A	N/A	N/A
Westbound	N/A	N/A	N/A
Northbound	N/A	N/A	N/A

Bikes (PM)

Approach	Left	Thru	Right
Southbound	0	0	0
Eastbound	0	1	0
Westbound	0	1	0
Northbound	0	0	0

Pedestrians (Crosswalks)

Crosswalk	Direction	AM	NOON	PM
North leg	Eastbound	5	0	0
North leg	Westbound	3	0	1
West leg	Southbound	4	0	1
West leg	Northbound	1	0	1
East leg	Southbound	0	0	0
East leg	Northbound	0	0	0
South leg	Eastbound	3	0	0
South leg	Westbound	1	0	1
NW diagonal		0	0	0
NE diagonal		0	0	0
SW diagonal		0	0	0
SE diagonal		0	0	0

Note:
TEV- Total Entering Volume
PHF- Peak Hour Factor

Prepared by National Data & Surveying Services

Appian Way & Tara Hills Dr/Canyon Dr

Peak Hour Turning Movement Count

ID: 19-08334-002
City: Pinole

Day: Monday
Date: 06/03/2019

	PEAK HOURS	COUNT PERIODS
AM	07:45 AM - 08:45 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:00 PM - 05:00 PM	04:00 PM - 06:00 PM

Appian Way – SOUTHBOUND

	Right	Through	Left	U-Turn	Departing
AM	94	786	10	0	668
NOON	0	0	0	0	0
PM	61	539	9	2	809
Lanes	1	2	1	0	

Tara Hills Dr/Canyon Dr – EASTBOUND

	AM	NOON	PM	Lanes
Departing	571	0	578	
U-Turn	0	0	0	0
Left	98	0	100	0.5
Through	22	0	41	0.5
Right	608	0	487	2

Tara Hills Dr/Canyon Dr – WESTBOUND

	Lanes	PM	NOON	AM
Right	1	13	0	13
Through	1.5	28	0	23
Left	0.5	59	0	87
U-Turn	0	0	0	0
Departing		177	0	70

Appian Way – NORTHBOUND

	Departing	U-Turn	Left	Through	Right
Lanes		0	2	2	0
PM	1085	0	489	694	127
NOON	0	0	0	0	0
AM	1481	0	454	557	38

CONTROL

Signalized

	AM	NOON	PM
TEV	2790	0	2649
PHF	0.94		0.87

Total Vehicles (AM)

SB: 94, 786, 10 — EB: 98, 22, 608 — WB: 13, 23, 87 — NB: 454, 557, 38

Total Vehicles (Noon)

SB: N/A, N/A, N/A — EB: N/A, N/A, N/A — WB: N/A, N/A, N/A — NB: N/A, N/A, N/A

Total Vehicles (PM)

SB: 61, 539, 9 — EB: 100, 41, 487 — WB: 13, 28, 59 — NB: 489, 694, 127

Bikes (AM)

SB: 0, 0, 0 — EB: 0, 0, 1 — WB: 0, 0, 0 — NB: 0, 0, 0

Bikes (NOON)

SB: N/A, N/A, N/A — EB: N/A, N/A, N/A — WB: N/A, N/A, N/A — NB: N/A, N/A, N/A

Bikes (PM)

SB: 0, 1, 0 — EB: 1, 0, 0 — WB: 0, 0, 0 — NB: 0, 1, 0

Pedestrians (Crosswalks)

Crosswalk	Direction	AM	NOON	PM
North	Eastbound	2	0	2
North	Westbound	2	0	1
West	Southbound	1	0	11
West	Northbound	8	0	2
East	Southbound	1	0	1
East	Northbound	5	0	5
South	Eastbound	0	0	0
South	Westbound	0	0	0
NW diagonal		0	0	0
NE diagonal		0	0	0
SW diagonal		0	0	0
SE diagonal		0	0	0

Note:
TEV- Total Entering Volume
PHF- Peak Hour Factor

Prepared by National Data & Surveying Services

Appian Way & I-80 WB Ramps

Peak Hour Turning Movement Count

ID: 19-08334-003
City: Pinole

Day: Monday
Date: 06/03/2019

	PEAK HOURS	COUNT PERIODS
AM	07:45 AM - 08:45 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:00 PM - 05:00 PM	04:00 PM - 06:00 PM

Appian Way — SOUTHBOUND

	Right	Through	Left	U-Turn	Exit
AM	661	842	0	0	1058
NOON	0	0	0	0	0
PM	465	636	0	0	1307
Lanes	1	2	0	0	

I-80 WB Ramps — WESTBOUND

Movement	Lanes	PM	NOON	AM
Right	1.3	270	0	334
Through	0.3	2	0	6
Left	1.3	578	0	559
U-Turn	0	0	0	0
Exit		0	0	0

I-80 WB Ramps — EASTBOUND

Movement	AM	NOON	PM	Lanes
Exit	847	0	625	
U-Turn	0	0	0	0
Left	0	0	0	0
Through	0	0	0	0
Right	0	0	0	0

CONTROL

Signalized

	AM	NOON	PM
TEV	3308	0	3149
PHF	0.97		0.90

Appian Way — NORTHBOUND

	Exit	U-Turn	Left	Through	Right
Lanes		0	1	2	0
PM	1217	3	158	1037	0
NOON	0	0	0	0	0
AM	1403	2	180	724	0

Total Vehicles (AM)

Approach	Right	Through	Left
Southbound	661	842	0
Eastbound	0	0	0
Westbound	334	6	559
Northbound	0	724	180

Total Vehicles (Noon)

All movements: N/A

Total Vehicles (PM)

Approach	Right	Through	Left
Southbound	465	636	0
Eastbound	0	0	0
Westbound	270	2	578
Northbound	0	103	158

Bikes (AM)

Approach	Right	Through	Left
Southbound	0	1	0
Eastbound	0	0	0
Westbound	0	0	0
Northbound	0	0	0

Bikes (NOON)

All movements: N/A

Bikes (PM)

Approach	Right	Through	Left
Southbound	0	1	0
Eastbound	0	0	0
Westbound	0	0	0
Northbound	0	1	0

Pedestrians (Crosswalks)

Crosswalk	PM	NOON	AM
West leg (southbound direction)	14	0	0
West leg (northbound direction)	4	0	6
East leg (southbound direction)	0	0	0
East leg (northbound direction)	4	0	3
North leg	0 / 0	0 / 0	0 / 0
South leg	0 / 0	0 / 0	0 / 0
Diagonals (each)	0	0	0

Note:
TEV- Total Entering Volume
PHF- Peak Hour Factor

Prepared by National Data & Surveying Services

Appian Way & I-80 EB Ramps

Peak Hour Turning Movement Count

ID: 19-08334-004
City: Pinole

Day: Monday
Date: 06/03/2019

PEAK HOURS		COUNT PERIODS
07:45 AM - 08:45 AM	AM	07:00 AM - 09:00 AM
NONE	NOON	NONE
04:45 PM - 05:45 PM	PM	04:00 PM - 06:00 PM

Appian Way – SOUTHBOUND

	Right	Thru	Left	U-Turn	Out
AM	303	1104	0	0	906
NOON	0	0	0	0	0
PM	211	1002	0	0	1248
% Heavy	1	2	0	0	

I-80 EB Ramps – EASTBOUND

	AM	NOON	PM	% Heavy
Out	303	0	211	
U-Turn	0	0	0	0
Left	376	0	322	1.3
Thru	0	0	22	0.3
Right	131	0	101	1.3

I-80 EB Ramps – WESTBOUND

	PM	NOON	AM	% Heavy
Right	0	0	0	0
Thru	0	0	0	0
Left	0	0	0	0
U-Turn	0	0	0	0
Out	1116	0	564	

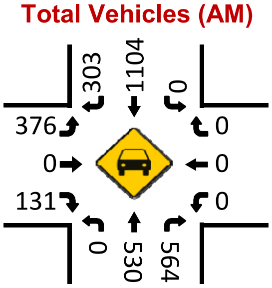
CONTROL

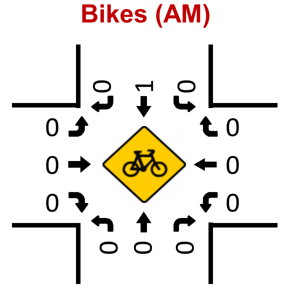
Signalized

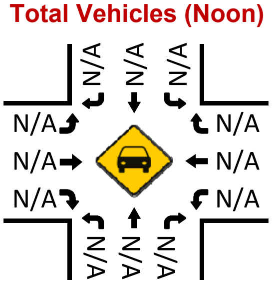
	AM	NOON	PM
TEV	3008	0	3678
PHF	0.96		0.97

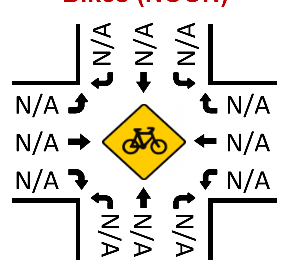
Appian Way – NORTHBOUND

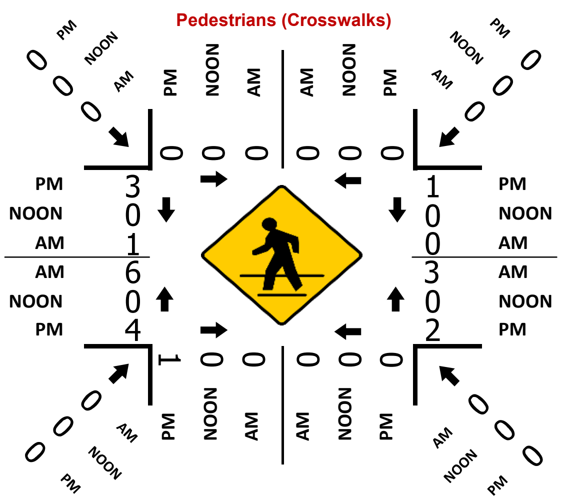
	Out	U-Turn	Left	Thru	Right
% Heavy		0	0	1.5	1.5
PM	1103	0	0	926	1094
NOON	0	0	0	0	0
AM	1235	0	0	530	564

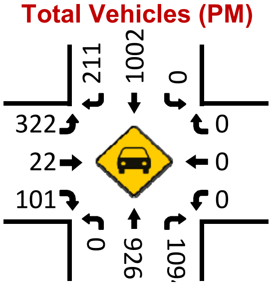


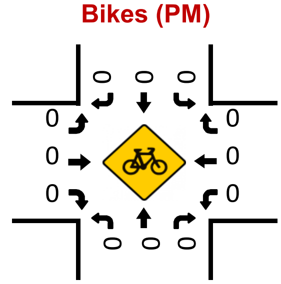












Note:
TEV- Total Entering Volume
PHF- Peak Hour Factor

Appendix B

Existing Condition LOS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	598	16	93	357	106	30	6	78	72	4	31
Future Volume (vph)	31	598	16	93	357	106	30	6	78	72	4	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.5		3.5	4.5			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.97			0.90		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1770	3523		1770	3402			3132		1770	1594	
Flt Permitted	0.95	1.00		0.95	1.00			0.88		0.66	1.00	
Satd. Flow (perm)	1770	3523		1770	3402			2803		1229	1594	
Peak-hour factor, PHF	0.79	0.79	0.79	0.75	0.75	0.75	0.79	0.79	0.79	0.85	0.85	0.85
Adj. Flow (vph)	39	757	20	124	476	141	38	8	99	85	5	36
RTOR Reduction (vph)	0	2	0	0	18	0	0	79	0	0	29	0
Lane Group Flow (vph)	39	775	0	124	599	0	0	66	0	85	12	0
Confl. Peds. (#/hr)			4			8	5					5
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			4			4	
Permitted Phases							4			4		
Actuated Green, G (s)	3.7	25.8		8.3	30.4			11.7		11.7	11.7	
Effective Green, g (s)	3.7	25.8		8.3	30.4			11.7		11.7	11.7	
Actuated g/C Ratio	0.06	0.45		0.14	0.53			0.20		0.20	0.20	
Clearance Time (s)	3.5	4.5		3.5	4.5			4.0		4.0	4.0	
Vehicle Extension (s)	2.0	4.0		3.0	4.0			4.0		4.0	4.0	
Lane Grp Cap (vph)	113	1572		254	1789			567		248	322	
v/s Ratio Prot	0.02	c0.22		c0.07	0.18						0.01	
v/s Ratio Perm								0.02		c0.07		
v/c Ratio	0.35	0.49		0.49	0.33			0.12		0.34	0.04	
Uniform Delay, d1	25.9	11.4		22.8	7.9			18.8		19.8	18.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.3		1.5	0.2			0.1		1.1	0.1	
Delay (s)	26.6	11.7		24.3	8.0			19.0		20.9	18.6	
Level of Service	C	B		C	A			B		C	B	
Approach Delay (s)		12.4			10.8			19.0			20.1	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	12.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	57.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	43.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	39	773	103	617	120	85	40
v/c Ratio	0.20	0.49	0.34	0.32	0.19	0.33	0.11
Control Delay	29.4	13.9	26.9	8.0	10.3	25.0	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.4	13.9	26.9	8.0	10.3	25.0	10.1
Queue Length 50th (ft)	12	92	29	33	5	23	1
Queue Length 95th (ft)	39	157	70	93	22	66	22
Internal Link Dist (ft)		537		492	298		312
Turn Bay Length (ft)	95		235				
Base Capacity (vph)	1083	3415	541	2917	1536	674	862
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.23	0.19	0.21	0.08	0.13	0.05

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	377	28	166	353	36	76	9	170	83	7	24
Future Volume (vph)	13	377	28	166	353	36	76	9	170	83	7	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.5		3.5	4.5			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99			0.90		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1770	3497		1770	3486			3137		1770	1627	
Flt Permitted	0.95	1.00		0.95	1.00			0.86		0.55	1.00	
Satd. Flow (perm)	1770	3497		1770	3486			2726		1016	1627	
Peak-hour factor, PHF	0.83	0.83	0.83	0.90	0.90	0.90	0.85	0.85	0.85	0.86	0.86	0.86
Adj. Flow (vph)	16	454	34	184	392	40	89	11	200	97	8	28
RTOR Reduction (vph)	0	6	0	0	5	0	0	152	0	0	21	0
Lane Group Flow (vph)	16	482	0	184	427	0	0	148	0	97	15	0
Confl. Peds. (#/hr)			1			1	2					2
Confl. Bikes (#/hr)			1			1						
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			4			4	
Permitted Phases							4			4		
Actuated Green, G (s)	1.0	23.6		12.5	35.1			15.1		15.1	15.1	
Effective Green, g (s)	1.0	23.6		12.5	35.1			15.1		15.1	15.1	
Actuated g/C Ratio	0.02	0.37		0.20	0.56			0.24		0.24	0.24	
Clearance Time (s)	3.5	4.5		3.5	4.5			4.0		4.0	4.0	
Vehicle Extension (s)	2.0	4.0		3.0	4.0			4.0		4.0	4.0	
Lane Grp Cap (vph)	28	1305		350	1936			651		242	388	
v/s Ratio Prot	0.01	c0.14		c0.10	0.12						0.01	
v/s Ratio Perm								0.05		c0.10		
v/c Ratio	0.57	0.37		0.53	0.22			0.23		0.40	0.04	
Uniform Delay, d1	30.9	14.4		22.7	7.1			19.4		20.2	18.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	16.3	0.2		1.4	0.1			0.2		1.5	0.1	
Delay (s)	47.2	14.6		24.1	7.2			19.6		21.7	18.5	
Level of Service	D	B		C	A			B		C	B	
Approach Delay (s)		15.7			12.3			19.6			20.9	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	63.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	16	488	184	432	300	97	36
v/c Ratio	0.10	0.41	0.50	0.21	0.36	0.38	0.08
Control Delay	31.0	18.0	28.0	8.2	8.0	23.7	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.0	18.0	28.0	8.2	8.0	23.7	9.2
Queue Length 50th (ft)	5	67	58	30	14	29	2
Queue Length 95th (ft)	23	126	135	98	38	66	19
Internal Link Dist (ft)		537		492	298		312
Turn Bay Length (ft)	95		235				
Base Capacity (vph)	957	3382	478	2828	1394	480	783
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.14	0.38	0.15	0.22	0.20	0.05

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	24	616	87	25	13	454	565	38	10	786	100
Future Volume (vph)	103	24	616	87	25	13	454	565	38	10	786	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		5.1		4.7	5.0		4.0	5.1	5.1
Lane Util. Factor		1.00	0.88		0.95		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1790	2787		3361		3433	3497		1770	3539	1546
Flt Permitted		0.96	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1790	2787		3361		3433	3497		1770	3539	1546
Peak-hour factor, PHF	0.91	0.91	0.91	0.75	0.75	0.75	0.92	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	113	26	677	116	33	17	493	614	41	11	836	106
RTOR Reduction (vph)	0	0	0	0	8	0	0	0	0	0	0	61
Lane Group Flow (vph)	0	139	677	0	158	0	493	655	0	11	836	45
Confl. Peds. (#/hr)						4			6			9
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4	4 5	3	3		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)		14.0	38.1		17.8		24.1	77.7		1.8	54.6	54.6
Effective Green, g (s)		14.0	38.1		17.8		24.1	77.7		1.8	54.6	54.6
Actuated g/C Ratio		0.11	0.29		0.14		0.19	0.60		0.01	0.42	0.42
Clearance Time (s)		4.6			5.1		4.7	5.0		4.0	5.1	5.1
Vehicle Extension (s)		2.5			2.0		2.0	4.5		2.0	3.0	3.0
Lane Grp Cap (vph)		192	816		460		636	2090		24	1486	649
v/s Ratio Prot		0.08	c0.24		c0.05		0.14	0.19		0.01	c0.24	
v/s Ratio Perm												0.03
v/c Ratio		0.72	0.83		0.34		0.78	0.31		0.46	0.56	0.07
Uniform Delay, d1		56.1	42.9		50.8		50.4	12.9		63.6	28.6	22.5
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		11.9	6.9		0.2		5.4	0.4		5.0	1.5	0.2
Delay (s)		68.1	49.8		51.0		55.7	13.3		68.6	30.2	22.7
Level of Service		E	D		D		E	B		E	C	C
Approach Delay (s)		52.9			51.0			31.5			29.8	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	37.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	132	668	164	493	646	11	836	100
v/c Ratio	0.71	0.83	0.35	0.78	0.30	0.09	0.56	0.14
Control Delay	76.8	40.6	48.8	59.0	13.7	58.5	32.3	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.8	40.6	48.8	59.0	13.7	58.5	32.3	3.2
Queue Length 50th (ft)	109	216	65	206	106	9	261	0
Queue Length 95th (ft)	#195	194	69	251	252	29	#491	25
Internal Link Dist (ft)	492		509		406		608	
Turn Bay Length (ft)				310		170		150
Base Capacity (vph)	192	973	869	842	2185	134	1499	729
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.69	0.19	0.59	0.30	0.08	0.56	0.14

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	41	487	59	28	13	489	694	127	11	539	61
Future Volume (vph)	100	41	487	59	28	13	489	694	127	11	539	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.7		5.1		4.7	5.0		4.0	5.1	5.1
Lane Util. Factor		1.00	0.88		0.95		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00		1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1799	2787		3365		3433	3435		1770	3539	1534
Flt Permitted		0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1799	2787		3365		3433	3435		1770	3539	1534
Peak-hour factor, PHF	0.89	0.89	0.89	0.86	0.86	0.86	0.92	0.92	0.92	0.72	0.72	0.72
Adj. Flow (vph)	112	46	547	69	33	15	532	754	138	15	749	85
RTOR Reduction (vph)	0	0	0	0	10	0	0	0	0	0	0	49
Lane Group Flow (vph)	0	158	547	0	107	0	532	892	0	15	749	36
Confl. Peds. (#/hr)						3			6			13
Confl. Bikes (#/hr)									1			1
Turn Type	Split	NA	pm+ov	Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4	5	3	3		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)		16.8	43.4		17.8		26.6	83.2		3.5	59.3	59.3
Effective Green, g (s)		16.8	43.4		17.8		26.6	83.2		3.5	59.3	59.3
Actuated g/C Ratio		0.12	0.31		0.13		0.19	0.59		0.02	0.42	0.42
Clearance Time (s)		4.6	4.7		5.1		4.7	5.0		4.0	5.1	5.1
Vehicle Extension (s)		2.5	2.0		2.0		2.0	4.5		2.0	3.0	3.0
Lane Grp Cap (vph)		215	863		427		652	2041		44	1499	649
v/s Ratio Prot		c0.09	0.12		c0.03		c0.15	0.26		0.01	c0.21	
v/s Ratio Perm			0.08									0.02
v/c Ratio		0.73	0.63		0.25		0.82	0.44		0.34	0.50	0.06
Uniform Delay, d1		59.5	41.5		55.1		54.4	15.6		67.1	29.5	23.8
Progression Factor		1.00	1.00		1.00		0.86	0.74		1.00	1.00	1.00
Incremental Delay, d2		11.6	1.1		0.1		6.7	0.6		1.7	1.2	0.2
Delay (s)		71.0	42.6		55.2		53.6	12.1		68.8	30.7	24.0
Level of Service		E	D		E		D	B		E	C	C
Approach Delay (s)		49.0			55.2			27.6			30.7	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	34.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	158	547	117	532	892	15	749	85
v/c Ratio	0.73	0.63	0.27	0.82	0.42	0.14	0.50	0.12
Control Delay	78.7	28.7	49.9	56.3	13.2	65.1	33.7	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Total Delay	78.7	28.7	49.9	56.3	13.4	65.1	33.7	2.7
Queue Length 50th (ft)	141	177	47	173	93	13	248	0
Queue Length 95th (ft)	213	131	64	291	394	30	318	0
Internal Link Dist (ft)	492		509		406		608	
Turn Bay Length (ft)				310		170		150
Base Capacity (vph)	257	1045	810	877	2100	111	1497	718
Starvation Cap Reductn	0	0	0	0	468	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	10	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.52	0.14	0.61	0.55	0.14	0.50	0.12

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	559	6	337	182	729	0	0	847	664
Future Volume (vph)	0	0	0	559	6	337	182	729	0	0	847	664
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	4.0	3.0	4.0			4.0	
Lane Util. Factor				0.95	0.91	0.95	1.00	0.95			0.95	
Frpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			0.99	
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	
Frt				1.00	0.97	0.85	1.00	1.00			0.93	
Flt Protected				0.95	0.96	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1681	1585	1504	1770	3539			3270	
Flt Permitted				0.95	0.96	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1681	1585	1504	1770	3539			3270	
Peak-hour factor, PHF	0.25	0.25	0.25	0.89	0.89	0.89	0.98	0.98	0.98	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	628	7	379	186	744	0	0	931	730
RTOR Reduction (vph)	0	0	0	0	7	182	0	0	0	0	99	0
Lane Group Flow (vph)	0	0	0	352	340	133	186	744	0	0	1562	0
Confl. Peds. (#/hr)									3			6
Confl. Bikes (#/hr)												1
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)				29.6	29.6	29.6	17.4	82.4			62.0	
Effective Green, g (s)				29.6	29.6	29.6	17.4	82.4			62.0	
Actuated g/C Ratio				0.25	0.25	0.25	0.14	0.69			0.52	
Clearance Time (s)				4.0	4.0	4.0	3.0	4.0			4.0	
Vehicle Extension (s)				2.0	2.0	2.0	2.5	4.0			4.0	
Lane Grp Cap (vph)				414	390	370	256	2430			1689	
v/s Ratio Prot							c0.11	0.21			c0.48	
v/s Ratio Perm				0.21	0.21	0.09						
v/c Ratio				0.85	0.87	0.36	0.73	0.31			0.92	
Uniform Delay, d1				43.1	43.4	37.4	49.0	7.5			26.8	
Progression Factor				1.00	1.00	1.00	1.12	1.21			1.00	
Incremental Delay, d2				14.8	18.3	0.2	8.3	0.3			10.1	
Delay (s)				57.9	61.7	37.6	63.4	9.3			36.9	
Level of Service				E	E	D	E	A			D	
Approach Delay (s)		0.0			52.9			20.1			36.9	
Approach LOS		A			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	37.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	84.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	352	343	315	186	739	1651
v/c Ratio	0.86	0.87	0.57	0.73	0.30	0.92
Control Delay	62.8	63.8	13.3	69.0	9.9	34.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	42.4
Total Delay	62.8	63.8	13.3	69.0	9.9	76.7
Queue Length 50th (ft)	268	268	44	147	141	566
Queue Length 95th (ft)	374	380	130	219	175	#850
Internal Link Dist (ft)		673			371	406
Turn Bay Length (ft)	230		230	310		
Base Capacity (vph)	476	456	601	354	2436	1794
Starvation Cap Reductn	0	0	0	0	0	283
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.75	0.52	0.53	0.30	1.09

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	578	2	270	161	1037	0	0	636	465
Future Volume (vph)	0	0	0	578	2	270	161	1037	0	0	636	465
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	4.0	3.0	4.0			4.0	
Lane Util. Factor				0.95	0.91	0.95	1.00	0.95			0.95	
Frpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			0.98	
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	
Frt				1.00	0.99	0.85	1.00	1.00			0.94	
Flt Protected				0.95	0.96	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1681	1600	1504	1770	3539			3237	
Flt Permitted				0.95	0.96	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1681	1600	1504	1770	3539			3237	
Peak-hour factor, PHF	0.25	0.25	0.25	0.88	0.88	0.88	0.95	0.95	0.95	0.86	0.86	0.86
Adj. Flow (vph)	0	0	0	657	2	307	169	1092	0	0	740	541
RTOR Reduction (vph)	0	0	0	0	3	85	0	0	0	0	69	0
Lane Group Flow (vph)	0	0	0	348	339	191	169	1092	0	0	1212	0
Confl. Peds. (#/hr)									4			18
Confl. Bikes (#/hr)									1			1
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)				34.6	34.6	34.6	18.3	97.4			76.1	
Effective Green, g (s)				34.6	34.6	34.6	18.3	97.4			76.1	
Actuated g/C Ratio				0.25	0.25	0.25	0.13	0.70			0.54	
Clearance Time (s)				4.0	4.0	4.0	3.0	4.0			4.0	
Vehicle Extension (s)				2.0	2.0	2.0	2.5	4.0			4.0	
Lane Grp Cap (vph)				415	395	371	231	2462			1759	
v/s Ratio Prot							c0.10	0.31			c0.37	
v/s Ratio Perm				0.21	0.21	0.13						
v/c Ratio				0.84	0.86	0.51	0.73	0.44			0.69	
Uniform Delay, d1				50.0	50.4	45.5	58.5	9.4			23.3	
Progression Factor				1.00	1.00	1.00	1.04	1.11			0.89	
Incremental Delay, d2				13.2	16.1	0.5	9.1	0.5			2.0	
Delay (s)				63.3	66.4	46.0	69.8	10.9			22.7	
Level of Service				E	E	D	E	B			C	
Approach Delay (s)		0.0			59.4			18.8			22.7	
Approach LOS		A			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	31.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	348	342	276	169	1092	1281
v/c Ratio	0.84	0.86	0.61	0.73	0.44	0.70
Control Delay	67.4	70.0	31.7	75.9	11.9	22.2
Queue Delay	0.0	0.0	0.0	0.0	0.3	0.1
Total Delay	67.4	70.0	31.7	75.9	12.2	22.3
Queue Length 50th (ft)	315	321	136	153	237	286
Queue Length 95th (ft)	406	417	216	230	307	263
Internal Link Dist (ft)		673			371	406
Turn Bay Length (ft)	230		230	310		
Base Capacity (vph)	504	482	530	429	2462	1830
Starvation Cap Reductn	0	0	0	0	717	59
Spillback Cap Reductn	0	0	1	0	59	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.71	0.52	0.39	0.63	0.72

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	378	0	131	0	0	0	0	533	564	0	1107	0
Future Volume (vph)	378	0	131	0	0	0	0	533	564	0	1107	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0	4.0		4.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	0.91		0.95	
Frpb, ped/bikes	1.00	1.00	1.00					1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00	1.00		1.00	
Frt	1.00	0.99	0.85					0.96	0.85		1.00	
Flt Protected	0.95	0.96	1.00					1.00	1.00		1.00	
Satd. Flow (prot)	1681	1603	1504					3225	1419		3539	
Flt Permitted	0.95	0.96	1.00					1.00	1.00		1.00	
Satd. Flow (perm)	1681	1603	1504					3225	1419		3539	
Peak-hour factor, PHF	0.83	0.83	0.83	0.25	0.25	0.25	0.98	0.98	0.98	0.95	0.95	0.95
Adj. Flow (vph)	455	0	158	0	0	0	0	544	576	0	1165	0
RTOR Reduction (vph)	0	14	84	0	0	0	0	71	115	0	0	0
Lane Group Flow (vph)	237	220	58	0	0	0	0	703	231	0	1165	0
Confl. Peds. (#/hr)									3			7
Confl. Bikes (#/hr)												1
Turn Type	Perm	NA	Perm					NA	Perm		NA	
Protected Phases		4						2			6	
Permitted Phases	4		4						2			
Actuated Green, G (s)	12.0	12.0	12.0					40.0	40.0		40.0	
Effective Green, g (s)	12.0	12.0	12.0					40.0	40.0		40.0	
Actuated g/C Ratio	0.20	0.20	0.20					0.67	0.67		0.67	
Clearance Time (s)	4.0	4.0	4.0					4.0	4.0		4.0	
Vehicle Extension (s)	2.0	2.0	2.0					4.0	4.0		4.0	
Lane Grp Cap (vph)	336	320	300					2150	946		2359	
v/s Ratio Prot								0.22			c0.33	
v/s Ratio Perm	c0.14	0.14	0.04						0.16			
v/c Ratio	0.71	0.69	0.19					0.33	0.24		0.49	
Uniform Delay, d1	22.4	22.3	20.0					4.3	4.0		5.0	
Progression Factor	1.00	1.00	1.00					1.00	1.00		0.63	
Incremental Delay, d2	5.4	4.8	0.1					0.4	0.6		0.4	
Delay (s)	27.8	27.1	20.1					4.7	4.6		3.5	
Level of Service	C	C	C					A	A		A	
Approach Delay (s)		25.7			0.0			4.6			3.5	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	85.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	NBT	NBR	SBT
Lane Group Flow (vph)	236	233	142	771	346	1162
v/c Ratio	0.70	0.70	0.37	0.35	0.33	0.49
Control Delay	35.3	33.1	10.4	3.7	1.5	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.3	33.1	10.4	3.7	1.5	3.7
Queue Length 50th (ft)	82	78	11	39	0	106
Queue Length 95th (ft)	#153	#150	46	57	21	m137
Internal Link Dist (ft)		752		715		57
Turn Bay Length (ft)	380		185			
Base Capacity (vph)	365	362	408	2272	1080	2422
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.64	0.35	0.34	0.32	0.48

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	322	22	101	0	0	0	0	926	1094	0	1002	0
Future Volume (vph)	322	22	101	0	0	0	0	926	1094	0	1002	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0	4.0		4.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	0.91		0.95	
Frpb, ped/bikes	1.00	1.00	0.99					0.99	0.98		1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00	1.00		1.00	
Frt	1.00	0.99	0.85					0.95	0.85		1.00	
Flt Protected	0.95	0.96	1.00					1.00	1.00		1.00	
Satd. Flow (prot)	1681	1613	1484					3202	1418		3539	
Flt Permitted	0.95	0.96	1.00					1.00	1.00		1.00	
Satd. Flow (perm)	1681	1613	1484					3202	1418		3539	
Peak-hour factor, PHF	0.98	0.98	0.98	0.25	0.25	0.25	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	329	22	103	0	0	0	0	985	1164	0	1089	0
RTOR Reduction (vph)	0	3	74	0	0	0	0	56	189	0	0	0
Lane Group Flow (vph)	181	177	19	0	0	0	0	1430	474	0	1089	0
Confl. Peds. (#/hr)			1						3			7
Turn Type	Perm	NA	Perm					NA	Perm		NA	
Protected Phases		4						2			6	
Permitted Phases	4		4						2			
Actuated Green, G (s)	12.0	12.0	12.0					50.0	50.0		50.0	
Effective Green, g (s)	12.0	12.0	12.0					50.0	50.0		50.0	
Actuated g/C Ratio	0.17	0.17	0.17					0.71	0.71		0.71	
Clearance Time (s)	4.0	4.0	4.0					4.0	4.0		4.0	
Vehicle Extension (s)	2.0	2.0	2.0					4.0	4.0		4.0	
Lane Grp Cap (vph)	288	276	254					2287	1012		2527	
v/s Ratio Prot								c0.45			0.31	
v/s Ratio Perm	0.11	0.11	0.01						0.33			
v/c Ratio	0.63	0.64	0.08					0.63	0.47		0.43	
Uniform Delay, d1	26.9	27.0	24.3					5.2	4.3		4.1	
Progression Factor	1.00	1.00	1.00					1.00	1.00		0.41	
Incremental Delay, d2	3.1	3.8	0.0					1.3	1.6		0.4	
Delay (s)	30.0	30.8	24.4					6.5	5.8		2.1	
Level of Service	C	C	C					A	A		A	
Approach Delay (s)		29.2			0.0			6.3			2.1	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	100.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	NBT	NBR	SBT
Lane Group Flow (vph)	181	180	93	1486	663	1089
v/c Ratio	0.63	0.64	0.28	0.63	0.55	0.43
Control Delay	36.0	36.3	8.6	6.6	2.4	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.0	36.3	8.6	6.6	2.4	2.3
Queue Length 50th (ft)	76	79	1	120	0	20
Queue Length 95th (ft)	128	131	35	241	36	147
Internal Link Dist (ft)		752		715		57
Turn Bay Length (ft)	380		185			
Base Capacity (vph)	504	487	507	2341	1202	2526
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.37	0.18	0.63	0.55	0.43

Intersection Summary

Appendix C

Existing Plus Project Condition LOS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	598	20	113	357	106	31	6	97	72	4	31
Future Volume (vph)	31	598	20	113	357	106	31	6	97	72	4	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.5		3.5	4.5			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.97			0.89		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1770	3519		1770	3401			3116		1770	1593	
Flt Permitted	0.95	1.00		0.95	1.00			0.89		0.64	1.00	
Satd. Flow (perm)	1770	3519		1770	3401			2805		1200	1593	
Peak-hour factor, PHF	0.79	0.79	0.79	0.75	0.75	0.75	0.79	0.79	0.79	0.85	0.85	0.85
Adj. Flow (vph)	39	757	25	151	476	141	39	8	123	85	5	36
RTOR Reduction (vph)	0	2	0	0	17	0	0	99	0	0	29	0
Lane Group Flow (vph)	39	780	0	151	600	0	0	71	0	85	12	0
Confl. Peds. (#/hr)			4			8	5					5
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			4			4	
Permitted Phases							4			4		
Actuated Green, G (s)	3.8	26.6		11.3	34.1			12.4		12.4	12.4	
Effective Green, g (s)	3.8	26.6		11.3	34.1			12.4		12.4	12.4	
Actuated g/C Ratio	0.06	0.43		0.18	0.55			0.20		0.20	0.20	
Clearance Time (s)	3.5	4.5		3.5	4.5			4.0		4.0	4.0	
Vehicle Extension (s)	2.0	4.0		3.0	4.0			4.0		4.0	4.0	
Lane Grp Cap (vph)	107	1502		321	1861			558		238	317	
v/s Ratio Prot	0.02	c0.22		c0.09	0.18						0.01	
v/s Ratio Perm								0.03		c0.07		
v/c Ratio	0.36	0.52		0.47	0.32			0.13		0.36	0.04	
Uniform Delay, d1	28.1	13.1		22.8	7.7			20.5		21.5	20.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.8	0.4		1.1	0.1			0.1		1.3	0.1	
Delay (s)	28.9	13.5		23.9	7.9			20.6		22.8	20.2	
Level of Service	C	B		C	A			C		C	C	
Approach Delay (s)		14.3			11.0			20.6			21.9	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	62.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	45.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	39	782	151	617	170	85	41
v/c Ratio	0.22	0.54	0.46	0.32	0.26	0.35	0.12
Control Delay	32.5	16.2	29.7	9.0	9.4	27.2	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.5	16.2	29.7	9.0	9.4	27.2	10.7
Queue Length 50th (ft)	13	107	48	62	6	26	1
Queue Length 95th (ft)	42	174	102	98	26	70	24
Internal Link Dist (ft)		537		492	298		312
Turn Bay Length (ft)	95		235				
Base Capacity (vph)	967	3331	484	2770	1403	574	777
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.23	0.31	0.22	0.12	0.15	0.05

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	377	39	229	353	36	87	11	232	83	9	24
Future Volume (vph)	13	377	39	229	353	36	87	11	232	83	9	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.5		3.5	4.5			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99			0.89		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1770	3482		1770	3486			3123		1770	1639	
Flt Permitted	0.95	1.00		0.95	1.00			0.86		0.44	1.00	
Satd. Flow (perm)	1770	3482		1770	3486			2725		829	1639	
Peak-hour factor, PHF	0.83	0.83	0.83	0.90	0.90	0.90	0.85	0.85	0.85	0.86	0.86	0.86
Adj. Flow (vph)	16	454	47	254	392	40	102	13	273	97	10	28
RTOR Reduction (vph)	0	9	0	0	5	0	0	203	0	0	21	0
Lane Group Flow (vph)	16	492	0	254	427	0	0	185	0	97	17	0
Confl. Peds. (#/hr)			1			1	2					2
Confl. Bikes (#/hr)			1			1						
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			4			4	
Permitted Phases							4			4		
Actuated Green, G (s)	1.1	23.7		16.2	38.8			17.8		17.8	17.8	
Effective Green, g (s)	1.1	23.7		16.2	38.8			17.8		17.8	17.8	
Actuated g/C Ratio	0.02	0.34		0.23	0.56			0.26		0.26	0.26	
Clearance Time (s)	3.5	4.5		3.5	4.5			4.0		4.0	4.0	
Vehicle Extension (s)	2.0	4.0		3.0	4.0			4.0		4.0	4.0	
Lane Grp Cap (vph)	27	1183		411	1940			695		211	418	
v/s Ratio Prot	0.01	c0.14		c0.14	0.12						0.01	
v/s Ratio Perm								0.07		c0.12		
v/c Ratio	0.59	0.42		0.62	0.22			0.27		0.46	0.04	
Uniform Delay, d1	34.1	17.7		24.0	7.8			20.7		21.9	19.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	21.0	0.3		2.8	0.1			0.3		2.2	0.1	
Delay (s)	55.1	18.0		26.7	7.9			21.0		24.1	19.6	
Level of Service	E	B		C	A			C		C	B	
Approach Delay (s)		19.2			14.9			21.0			22.8	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	69.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	16	501	254	432	388	97	38
v/c Ratio	0.12	0.46	0.59	0.21	0.42	0.44	0.08
Control Delay	33.8	20.9	31.7	9.0	7.4	26.4	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.8	20.9	31.7	9.0	7.4	26.4	9.2
Queue Length 50th (ft)	6	82	90	35	18	32	3
Queue Length 95th (ft)	24	135	#217	104	43	71	21
Internal Link Dist (ft)		537		492	298		312
Turn Bay Length (ft)	95		235				
Base Capacity (vph)	857	3264	429	2536	1311	351	710
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.15	0.59	0.17	0.30	0.28	0.05

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	27	626	87	28	13	473	557	38	10	786	106
Future Volume (vph)	110	27	626	87	28	13	473	557	38	10	786	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		5.1		4.7	5.0		4.0	5.1	5.1
Lane Util. Factor		1.00	0.88		0.95		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1791	2787		3366		3433	3497		1770	3539	1546
Flt Permitted		0.96	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1791	2787		3366		3433	3497		1770	3539	1546
Peak-hour factor, PHF	0.91	0.91	0.91	0.75	0.75	0.75	0.92	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	121	30	688	116	37	17	514	605	41	11	836	113
RTOR Reduction (vph)	0	0	0	0	8	0	0	0	0	0	0	66
Lane Group Flow (vph)	0	151	688	0	162	0	514	646	0	11	836	47
Confl. Peds. (#/hr)						4			6			9
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4	4 5	3	3		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)		14.0	38.8		17.8		24.8	77.7		1.8	53.9	53.9
Effective Green, g (s)		14.0	38.8		17.8		24.8	77.7		1.8	53.9	53.9
Actuated g/C Ratio		0.11	0.30		0.14		0.19	0.60		0.01	0.41	0.41
Clearance Time (s)		4.6			5.1		4.7	5.0		4.0	5.1	5.1
Vehicle Extension (s)		2.5			2.0		2.0	4.5		2.0	3.0	3.0
Lane Grp Cap (vph)		192	831		460		654	2090		24	1467	640
v/s Ratio Prot		0.08	c0.25		c0.05		0.15	0.18		0.01	c0.24	
v/s Ratio Perm												0.03
v/c Ratio		0.79	0.83		0.35		0.79	0.31		0.46	0.57	0.07
Uniform Delay, d1		56.5	42.5		50.9		50.1	12.9		63.6	29.2	23.0
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		18.2	6.7		0.2		5.7	0.4		5.0	1.6	0.2
Delay (s)		74.8	49.2		51.0		55.8	13.3		68.6	30.8	23.2
Level of Service		E	D		D		E	B		E	C	C
Approach Delay (s)		53.8			51.0			32.1			30.3	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	38.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	151	688	170	514	646	11	836	113
v/c Ratio	0.79	0.83	0.36	0.79	0.30	0.09	0.57	0.16
Control Delay	83.9	39.3	49.1	58.8	13.8	58.5	33.1	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.9	39.3	49.1	58.8	13.8	58.5	33.1	4.8
Queue Length 50th (ft)	126	221	67	214	106	9	265	0
Queue Length 95th (ft)	#236	202	72	259	252	29	#500	37
Internal Link Dist (ft)	492		509		406		608	
Turn Bay Length (ft)				310		170		150
Base Capacity (vph)	192	986	871	842	2175	134	1468	716
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.70	0.20	0.61	0.30	0.08	0.57	0.16

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	121	48	521	59	36	13	523	694	127	11	539	82
Future Volume (vph)	121	48	521	59	36	13	523	694	127	11	539	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.7		5.1		4.7	5.0		4.0	5.1	5.1
Lane Util. Factor		1.00	0.88		0.95		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00		1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1798	2787		3377		3433	3435		1770	3539	1534
Flt Permitted		0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1798	2787		3377		3433	3435		1770	3539	1534
Peak-hour factor, PHF	0.89	0.89	0.89	0.86	0.86	0.86	0.92	0.92	0.92	0.72	0.72	0.72
Adj. Flow (vph)	136	54	585	69	42	15	568	754	138	15	749	114
RTOR Reduction (vph)	0	0	0	0	9	0	0	0	0	0	0	68
Lane Group Flow (vph)	0	190	585	0	117	0	568	892	0	15	749	46
Confl. Peds. (#/hr)						3			6			13
Confl. Bikes (#/hr)									1			1
Turn Type	Split	NA	pm+ov	Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4	5	3	3		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)		18.0	46.3		17.8		28.3	82.0		3.5	56.4	56.4
Effective Green, g (s)		18.0	46.3		17.8		28.3	82.0		3.5	56.4	56.4
Actuated g/C Ratio		0.13	0.33		0.13		0.20	0.59		0.02	0.40	0.40
Clearance Time (s)		4.6	4.7		5.1		4.7	5.0		4.0	5.1	5.1
Vehicle Extension (s)		2.5	2.0		2.0		2.0	4.5		2.0	3.0	3.0
Lane Grp Cap (vph)		231	921		429		693	2011		44	1425	617
v/s Ratio Prot		c0.11	0.13		c0.03		c0.17	0.26		0.01	c0.21	
v/s Ratio Perm			0.08									0.03
v/c Ratio		0.82	0.64		0.27		0.82	0.44		0.34	0.53	0.07
Uniform Delay, d1		59.4	39.7		55.3		53.4	16.2		67.1	31.7	25.7
Progression Factor		1.00	1.00		1.00		0.86	0.76		1.00	1.00	1.00
Incremental Delay, d2		20.1	1.1		0.1		6.5	0.6		1.7	1.4	0.2
Delay (s)		79.5	40.8		55.4		52.6	12.9		68.8	33.1	26.0
Level of Service		E	D		E		D	B		E	C	C
Approach Delay (s)		50.3			55.4			28.4			32.7	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	35.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	190	585	126	568	892	15	749	114
v/c Ratio	0.82	0.64	0.29	0.82	0.43	0.14	0.53	0.17
Control Delay	86.1	26.9	51.0	55.1	13.9	65.1	35.9	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Total Delay	86.1	26.9	51.0	55.1	14.1	65.1	35.9	6.3
Queue Length 50th (ft)	168	180	52	210	98	13	263	0
Queue Length 95th (ft)	#269	135	70	315	395	30	325	19
Internal Link Dist (ft)	492		509		406		608	
Turn Bay Length (ft)				310		170		150
Base Capacity (vph)	256	1069	812	877	2071	111	1423	688
Starvation Cap Reductn	0	0	0	0	454	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.55	0.16	0.65	0.55	0.14	0.53	0.17

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	559	6	342	182	735	0	0	853	668
Future Volume (vph)	0	0	0	559	6	342	182	735	0	0	853	668
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	4.0	3.0	4.0			4.0	
Lane Util. Factor				0.95	0.91	0.95	1.00	0.95			0.95	
Frpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			0.99	
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	
Frt				1.00	0.97	0.85	1.00	1.00			0.93	
Flt Protected				0.95	0.96	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1681	1585	1504	1770	3539			3270	
Flt Permitted				0.95	0.96	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1681	1585	1504	1770	3539			3270	
Peak-hour factor, PHF	0.25	0.25	0.25	0.89	0.89	0.89	0.98	0.98	0.98	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	628	7	384	186	750	0	0	937	734
RTOR Reduction (vph)	0	0	0	0	8	180	0	0	0	0	99	0
Lane Group Flow (vph)	0	0	0	352	340	139	186	750	0	0	1572	0
Confl. Peds. (#/hr)									3			6
Confl. Bikes (#/hr)												1
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)				29.6	29.6	29.6	17.4	82.4			62.0	
Effective Green, g (s)				29.6	29.6	29.6	17.4	82.4			62.0	
Actuated g/C Ratio				0.25	0.25	0.25	0.14	0.69			0.52	
Clearance Time (s)				4.0	4.0	4.0	3.0	4.0			4.0	
Vehicle Extension (s)				2.0	2.0	2.0	2.5	4.0			4.0	
Lane Grp Cap (vph)				414	390	370	256	2430			1689	
v/s Ratio Prot							c0.11	0.21			c0.48	
v/s Ratio Perm				0.21	0.21	0.09						
v/c Ratio				0.85	0.87	0.38	0.73	0.31			0.93	
Uniform Delay, d1				43.1	43.4	37.5	49.0	7.5			27.0	
Progression Factor				1.00	1.00	1.00	1.12	1.20			1.00	
Incremental Delay, d2				14.8	18.4	0.2	8.3	0.3			10.7	
Delay (s)				57.9	61.8	37.8	63.2	9.3			37.7	
Level of Service				E	E	D	E	A			D	
Approach Delay (s)		0.0			52.9			20.0			37.7	
Approach LOS		A			D			B			D	

Intersection Summary			
HCM 2000 Control Delay	37.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	84.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	352	348	319	186	750	1671
v/c Ratio	0.85	0.87	0.58	0.73	0.31	0.93
Control Delay	61.8	64.2	14.3	68.9	10.0	36.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	44.8
Total Delay	61.8	64.2	14.3	68.9	10.0	80.9
Queue Length 50th (ft)	267	270	50	147	143	587
Queue Length 95th (ft)	374	#389	138	219	178	#867
Internal Link Dist (ft)		673			371	406
Turn Bay Length (ft)	230		230	310		
Base Capacity (vph)	476	456	597	354	2430	1788
Starvation Cap Reductn	0	0	0	0	0	275
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.76	0.53	0.53	0.31	1.10

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	578	2	283	161	1058	0	0	657	478
Future Volume (vph)	0	0	0	578	2	283	161	1058	0	0	657	478
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	4.0	3.0	4.0			4.0	
Lane Util. Factor				0.95	0.91	0.95	1.00	0.95			0.95	
Frpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			0.98	
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	
Frt				1.00	0.99	0.85	1.00	1.00			0.94	
Flt Protected				0.95	0.96	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1681	1599	1504	1770	3539			3237	
Flt Permitted				0.95	0.96	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1681	1599	1504	1770	3539			3237	
Peak-hour factor, PHF	0.25	0.25	0.25	0.88	0.88	0.88	0.95	0.95	0.95	0.86	0.86	0.86
Adj. Flow (vph)	0	0	0	657	2	322	169	1114	0	0	764	556
RTOR Reduction (vph)	0	0	0	0	3	81	0	0	0	0	69	0
Lane Group Flow (vph)	0	0	0	348	340	209	169	1114	0	0	1251	0
Confl. Peds. (#/hr)									4			18
Confl. Bikes (#/hr)									1			1
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)				34.6	34.6	34.6	18.3	97.4			76.1	
Effective Green, g (s)				34.6	34.6	34.6	18.3	97.4			76.1	
Actuated g/C Ratio				0.25	0.25	0.25	0.13	0.70			0.54	
Clearance Time (s)				4.0	4.0	4.0	3.0	4.0			4.0	
Vehicle Extension (s)				2.0	2.0	2.0	2.5	4.0			4.0	
Lane Grp Cap (vph)				415	395	371	231	2462			1759	
v/s Ratio Prot							c0.10	0.31			c0.39	
v/s Ratio Perm				0.21	0.21	0.14						
v/c Ratio				0.84	0.86	0.56	0.73	0.45			0.71	
Uniform Delay, d1				50.0	50.4	46.1	58.5	9.5			23.8	
Progression Factor				1.00	1.00	1.00	1.04	1.11			0.91	
Incremental Delay, d2				13.2	16.6	1.2	9.1	0.5			2.2	
Delay (s)				63.3	67.0	47.2	69.8	11.0			23.7	
Level of Service				E	E	D	E	B			C	
Approach Delay (s)		0.0			59.9			18.7			23.7	
Approach LOS		A			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	31.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	348	343	290	169	1114	1320
v/c Ratio	0.84	0.86	0.64	0.73	0.45	0.72
Control Delay	67.3	70.1	34.7	75.8	12.0	23.4
Queue Delay	0.0	0.0	0.0	0.0	0.4	0.1
Total Delay	67.3	70.1	34.7	75.8	12.3	23.5
Queue Length 50th (ft)	315	323	155	153	244	298
Queue Length 95th (ft)	406	417	238	230	315	276
Internal Link Dist (ft)		673			371	406
Turn Bay Length (ft)	230		230	310		
Base Capacity (vph)	504	482	526	429	2461	1829
Starvation Cap Reductn	0	0	0	0	705	56
Spillback Cap Reductn	0	0	1	0	61	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.71	0.55	0.39	0.63	0.74

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	381	0	131	0	0	0	0	536	564	0	1110	0
Future Volume (vph)	381	0	131	0	0	0	0	536	564	0	1110	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0	4.0		4.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	0.91		0.95	
Frpb, ped/bikes	1.00	1.00	1.00					1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00	1.00		1.00	
Frt	1.00	0.99	0.85					0.96	0.85		1.00	
Flt Protected	0.95	0.96	1.00					1.00	1.00		1.00	
Satd. Flow (prot)	1681	1603	1504					3225	1419		3539	
Flt Permitted	0.95	0.96	1.00					1.00	1.00		1.00	
Satd. Flow (perm)	1681	1603	1504					3225	1419		3539	
Peak-hour factor, PHF	0.83	0.83	0.83	0.25	0.25	0.25	0.98	0.98	0.98	0.95	0.95	0.95
Adj. Flow (vph)	459	0	158	0	0	0	0	547	576	0	1168	0
RTOR Reduction (vph)	0	14	83	0	0	0	0	70	115	0	0	0
Lane Group Flow (vph)	239	222	59	0	0	0	0	707	231	0	1168	0
Confl. Peds. (#/hr)									3			7
Confl. Bikes (#/hr)												1
Turn Type	Perm	NA	Perm					NA	Perm		NA	
Protected Phases		4						2			6	
Permitted Phases	4		4						2			
Actuated Green, G (s)	12.0	12.0	12.0					40.0	40.0		40.0	
Effective Green, g (s)	12.0	12.0	12.0					40.0	40.0		40.0	
Actuated g/C Ratio	0.20	0.20	0.20					0.67	0.67		0.67	
Clearance Time (s)	4.0	4.0	4.0					4.0	4.0		4.0	
Vehicle Extension (s)	2.0	2.0	2.0					4.0	4.0		4.0	
Lane Grp Cap (vph)	336	320	300					2150	946		2359	
v/s Ratio Prot								0.22			c0.33	
v/s Ratio Perm	c0.14	0.14	0.04						0.16			
v/c Ratio	0.71	0.69	0.20					0.33	0.24		0.50	
Uniform Delay, d1	22.4	22.3	20.0					4.3	4.0		5.0	
Progression Factor	1.00	1.00	1.00					1.00	1.00		0.63	
Incremental Delay, d2	5.8	5.2	0.1					0.4	0.6		0.4	
Delay (s)	28.2	27.4	20.1					4.7	4.6		3.5	
Level of Service	C	C	C					A	A		A	
Approach Delay (s)		26.0			0.0			4.7			3.5	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	NBT	NBR	SBT
Lane Group Flow (vph)	239	236	142	777	346	1168
v/c Ratio	0.71	0.70	0.37	0.35	0.33	0.50
Control Delay	35.8	33.6	10.5	3.8	1.5	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.8	33.6	10.5	3.8	1.5	3.7
Queue Length 50th (ft)	83	79	11	40	0	110
Queue Length 95th (ft)	#158	#158	47	57	21	m133
Internal Link Dist (ft)		752		715		57
Turn Bay Length (ft)	380		185			
Base Capacity (vph)	365	362	408	2271	1079	2418
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.65	0.35	0.34	0.32	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	331	22	101	0	0	0	0	938	1094	0	1014	0
Future Volume (vph)	331	22	101	0	0	0	0	938	1094	0	1014	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0	4.0		4.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	0.91		0.95	
Frpb, ped/bikes	1.00	1.00	1.00					0.99	0.98		1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00	1.00		1.00	
Frt	1.00	0.99	0.85					0.95	0.85		1.00	
Flt Protected	0.95	0.96	1.00					1.00	1.00		1.00	
Satd. Flow (prot)	1681	1615	1504					3206	1418		3539	
Flt Permitted	0.95	0.96	1.00					1.00	1.00		1.00	
Satd. Flow (perm)	1681	1615	1504					3206	1418		3539	
Peak-hour factor, PHF	0.98	0.98	0.98	0.25	0.25	0.25	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	338	22	103	0	0	0	0	998	1164	0	1102	0
RTOR Reduction (vph)	0	3	72	0	0	0	0	53	195	0	0	0
Lane Group Flow (vph)	186	181	21	0	0	0	0	1434	480	0	1102	0
Confl. Peds. (#/hr)									3			7
Turn Type	Perm	NA	Perm					NA	Perm		NA	
Protected Phases		4						2			6	
Permitted Phases	4		4						2			
Actuated Green, G (s)	12.2	12.2	12.2					49.8	49.8		49.8	
Effective Green, g (s)	12.2	12.2	12.2					49.8	49.8		49.8	
Actuated g/C Ratio	0.17	0.17	0.17					0.71	0.71		0.71	
Clearance Time (s)	4.0	4.0	4.0					4.0	4.0		4.0	
Vehicle Extension (s)	2.0	2.0	2.0					4.0	4.0		4.0	
Lane Grp Cap (vph)	292	281	262					2280	1008		2517	
v/s Ratio Prot								c0.45			0.31	
v/s Ratio Perm	0.11	0.11	0.01						0.34			
v/c Ratio	0.64	0.64	0.08					0.63	0.48		0.44	
Uniform Delay, d1	26.8	26.9	24.2					5.3	4.4		4.2	
Progression Factor	1.00	1.00	1.00					1.00	1.00		0.42	
Incremental Delay, d2	3.3	3.7	0.0					1.3	1.6		0.4	
Delay (s)	30.2	30.6	24.3					6.6	6.0		2.2	
Level of Service	C	C	C					A	A		A	
Approach Delay (s)		29.2			0.0			6.4			2.2	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	101.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	NBT	NBR	SBT
Lane Group Flow (vph)	186	184	93	1487	675	1102
v/c Ratio	0.64	0.65	0.28	0.64	0.56	0.44
Control Delay	36.1	36.3	8.7	6.7	2.5	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.1	36.3	8.7	6.7	2.5	2.4
Queue Length 50th (ft)	78	80	2	124	0	20
Queue Length 95th (ft)	130	134	35	246	36	157
Internal Link Dist (ft)		752		715		57
Turn Bay Length (ft)	380		185			
Base Capacity (vph)	504	487	512	2335	1203	2517
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.38	0.18	0.64	0.56	0.44

Intersection Summary

Appendix D

Growth Rate Calculation

Volume on Appian Way between	Year	AM	PM	AM Growth Rate	PM Growth Rate
Tara Hills Drive and I-80 WB Ramps	2018	3221	3548	0.3%	0.1%
	2040	3421	3658		
I-80 WB Ramps and I-80 EB Ramps	2018	3064	3217	0.3%	0.4%
	2040	3264	3509		
I-80 EB Ramps and Fitzegerald Way	2018	3110	3284	0.4%	0.4%
	2040	3408	3552		
Fitzgerald Drive and Michael Drive	2018	2754	2866	0.6%	0.4%
	2040	3108	3159		
Average Growth Rate				**0.38%**	**0.33%**

Appendix E

Cumulative Condition LOS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	650	14	84	388	115	29	5	68	78	3	34
Future Volume (vph)	34	650	14	84	388	115	29	5	68	78	3	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.5		3.5	4.5			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.97			0.90		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1770	3526		1770	3402			3136		1770	1584	
Flt Permitted	0.95	1.00		0.95	1.00			0.88		0.67	1.00	
Satd. Flow (perm)	1770	3526		1770	3402			2794		1248	1584	
Peak-hour factor, PHF	0.79	0.79	0.79	0.75	0.75	0.75	0.79	0.79	0.79	0.85	0.85	0.85
Adj. Flow (vph)	43	823	18	112	517	153	37	6	86	92	4	40
RTOR Reduction (vph)	0	2	0	0	18	0	0	68	0	0	32	0
Lane Group Flow (vph)	43	839	0	112	652	0	0	61	0	92	12	0
Confl. Peds. (#/hr)			4			8	5					5
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			4			4	
Permitted Phases							4			4		
Actuated Green, G (s)	3.8	27.3		8.1	31.6			12.3		12.3	12.3	
Effective Green, g (s)	3.8	27.3		8.1	31.6			12.3		12.3	12.3	
Actuated g/C Ratio	0.06	0.46		0.14	0.53			0.21		0.21	0.21	
Clearance Time (s)	3.5	4.5		3.5	4.5			4.0		4.0	4.0	
Vehicle Extension (s)	2.0	4.0		3.0	4.0			4.0		4.0	4.0	
Lane Grp Cap (vph)	112	1612		240	1800			575		257	326	
v/s Ratio Prot	0.02	c0.24		c0.06	0.19						0.01	
v/s Ratio Perm								0.02		c0.07		
v/c Ratio	0.38	0.52		0.47	0.36			0.11		0.36	0.04	
Uniform Delay, d1	26.8	11.5		23.8	8.2			19.2		20.3	19.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.8	0.4		1.4	0.2			0.1		1.2	0.1	
Delay (s)	27.6	11.9		25.2	8.4			19.3		21.5	19.0	
Level of Service	C	B		C	A			B		C	B	
Approach Delay (s)		12.7			10.8			19.3			20.7	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	12.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	59.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	410	30	180	384	39	83	10	185	90	8	26
Future Volume (vph)	14	410	30	180	384	39	83	10	185	90	8	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.5		3.5	4.5			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99			0.90		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1770	3498		1770	3486			3137		1770	1630	
Flt Permitted	0.95	1.00		0.95	1.00			0.85		0.51	1.00	
Satd. Flow (perm)	1770	3498		1770	3486			2714		952	1630	
Peak-hour factor, PHF	0.83	0.83	0.83	0.90	0.90	0.90	0.85	0.85	0.85	0.86	0.86	0.86
Adj. Flow (vph)	17	494	36	200	427	43	98	12	218	105	9	30
RTOR Reduction (vph)	0	6	0	0	5	0	0	163	0	0	22	0
Lane Group Flow (vph)	17	524	0	200	465	0	0	165	0	105	17	0
Confl. Peds. (#/hr)			1			1	2					2
Confl. Bikes (#/hr)			1			1						
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			4			4	
Permitted Phases							4			4		
Actuated Green, G (s)	1.1	24.2		13.7	36.8			16.8		16.8	16.8	
Effective Green, g (s)	1.1	24.2		13.7	36.8			16.8		16.8	16.8	
Actuated g/C Ratio	0.02	0.36		0.21	0.55			0.25		0.25	0.25	
Clearance Time (s)	3.5	4.5		3.5	4.5			4.0		4.0	4.0	
Vehicle Extension (s)	2.0	4.0		3.0	4.0			4.0		4.0	4.0	
Lane Grp Cap (vph)	29	1269		363	1923			683		239	410	
v/s Ratio Prot	0.01	c0.15		c0.11	0.13						0.01	
v/s Ratio Perm								0.06		c0.11		
v/c Ratio	0.59	0.41		0.55	0.24			0.24		0.44	0.04	
Uniform Delay, d1	32.6	15.9		23.7	7.7			19.9		21.0	18.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	18.0	0.3		1.8	0.1			0.3		1.8	0.1	
Delay (s)	50.5	16.2		25.6	7.8			20.1		22.7	18.9	
Level of Service	D	B		C	A			C		C	B	
Approach Delay (s)		17.3			13.1			20.1			21.7	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	66.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	107	24	661	95	25	14	494	605	41	11	854	102
Future Volume (vph)	107	24	661	95	25	14	494	605	41	11	854	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.7		5.1		4.7	5.0		4.0	5.1	5.1
Lane Util. Factor		1.00	0.88		0.95		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1789	2787		3358		3433	3496		1770	3539	1546
Flt Permitted		0.96	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1789	2787		3358		3433	3496		1770	3539	1546
Peak-hour factor, PHF	0.91	0.91	0.91	0.75	0.75	0.75	0.92	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	118	26	726	127	33	19	537	658	45	12	909	109
RTOR Reduction (vph)	0	0	0	0	8	0	0	0	0	0	0	64
Lane Group Flow (vph)	0	144	726	0	171	0	537	703	0	12	909	45
Confl. Peds. (#/hr)						4			6			9
Turn Type	Split	NA	pm+ov	Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4	5	3	3		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)		13.7	39.4		17.8		25.7	76.2		3.6	53.3	53.3
Effective Green, g (s)		13.7	39.4		17.8		25.7	76.2		3.6	53.3	53.3
Actuated g/C Ratio		0.11	0.30		0.14		0.20	0.59		0.03	0.41	0.41
Clearance Time (s)		4.6	4.7		5.1		4.7	5.0		4.0	5.1	5.1
Vehicle Extension (s)		2.5	2.0		2.0		2.0	4.5		2.0	3.0	3.0
Lane Grp Cap (vph)		188	844		459		678	2049		49	1450	633
v/s Ratio Prot		0.08	c0.17		c0.05		0.16	0.20		0.01	c0.26	
v/s Ratio Perm			0.09									0.03
v/c Ratio		0.77	0.86		0.37		0.79	0.34		0.24	0.63	0.07
Uniform Delay, d1		56.6	42.7		51.0		49.6	13.9		61.9	30.5	23.3
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		16.2	8.6		0.2		5.9	0.5		1.0	2.1	0.2
Delay (s)		72.8	51.3		51.2		55.5	14.4		62.8	32.5	23.5
Level of Service		E	D		D		E	B		E	C	C
Approach Delay (s)		54.9			51.2			32.2			31.9	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	39.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	109	45	529	64	30	14	532	754	138	12	586	66
Future Volume (vph)	109	45	529	64	30	14	532	754	138	12	586	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.7		5.1		4.7	5.0		4.0	5.1	5.1
Lane Util. Factor		1.00	0.88		0.95		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00		1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1799	2787		3365		3433	3435		1770	3539	1534
Flt Permitted		0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1799	2787		3365		3433	3435		1770	3539	1534
Peak-hour factor, PHF	0.89	0.89	0.89	0.86	0.86	0.86	0.92	0.92	0.92	0.72	0.72	0.72
Adj. Flow (vph)	122	51	594	74	35	16	578	820	150	17	814	92
RTOR Reduction (vph)	0	0	0	0	10	0	0	0	0	0	0	55
Lane Group Flow (vph)	0	173	594	0	115	0	578	970	0	17	814	37
Confl. Peds. (#/hr)						3			6			13
Confl. Bikes (#/hr)									1			1
Turn Type	Split	NA	pm+ov	Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4	5	3	3		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)		17.4	46.1		17.8		28.7	82.6		3.5	56.6	56.6
Effective Green, g (s)		17.4	46.1		17.8		28.7	82.6		3.5	56.6	56.6
Actuated g/C Ratio		0.12	0.33		0.13		0.20	0.59		0.02	0.40	0.40
Clearance Time (s)		4.6	4.7		5.1		4.7	5.0		4.0	5.1	5.1
Vehicle Extension (s)		2.5	2.0		2.0		2.0	4.5		2.0	3.0	3.0
Lane Grp Cap (vph)		223	917		427		703	2026		44	1430	620
v/s Ratio Prot		c0.10	0.13		c0.03		c0.17	0.28		0.01	c0.23	
v/s Ratio Perm			0.08									0.02
v/c Ratio		0.78	0.65		0.27		0.82	0.48		0.39	0.57	0.06
Uniform Delay, d1		59.4	40.0		55.2		53.2	16.4		67.2	32.3	25.5
Progression Factor		1.00	1.00		1.00		0.88	0.77		1.00	1.00	1.00
Incremental Delay, d2		14.9	1.2		0.1		6.5	0.7		2.0	1.6	0.2
Delay (s)		74.3	41.2		55.4		53.4	13.4		69.2	33.9	25.6
Level of Service		E	D		E		D	B		E	C	C
Approach Delay (s)		48.7			55.4			28.3			33.7	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	35.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	608	7	363	198	787	0	0	915	719
Future Volume (vph)	0	0	0	608	7	363	198	787	0	0	915	719
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	4.0	3.0	4.0			4.0	
Lane Util. Factor				0.95	0.91	0.95	1.00	0.95			0.95	
Frpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			0.99	
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	
Frt				1.00	0.97	0.85	1.00	1.00			0.93	
Flt Protected				0.95	0.96	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1681	1587	1504	1770	3539			3269	
Flt Permitted				0.95	0.96	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1681	1587	1504	1770	3539			3269	
Peak-hour factor, PHF	0.25	0.25	0.25	0.89	0.89	0.89	0.98	0.98	0.98	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	683	8	408	202	803	0	0	1005	790
RTOR Reduction (vph)	0	0	0	0	7	158	0	0	0	0	103	0
Lane Group Flow (vph)	0	0	0	382	367	185	202	803	0	0	1692	0
Confl. Peds. (#/hr)									3			6
Confl. Bikes (#/hr)												1
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)				31.2	31.2	31.2	18.2	80.8			59.6	
Effective Green, g (s)				31.2	31.2	31.2	18.2	80.8			59.6	
Actuated g/C Ratio				0.26	0.26	0.26	0.15	0.67			0.50	
Clearance Time (s)				4.0	4.0	4.0	3.0	4.0			4.0	
Vehicle Extension (s)				2.0	2.0	2.0	2.5	4.0			4.0	
Lane Grp Cap (vph)				437	412	391	268	2382			1623	
v/s Ratio Prot							c0.11	0.23			c0.52	
v/s Ratio Perm				0.23	0.23	0.12						
v/c Ratio				0.87	0.89	0.47	0.75	0.34			1.04	
Uniform Delay, d1				42.5	42.8	37.5	48.8	8.3			30.2	
Progression Factor				1.00	1.00	1.00	1.11	1.21			1.00	
Incremental Delay, d2				16.9	20.3	0.3	9.5	0.3			34.3	
Delay (s)				59.4	63.1	37.8	63.7	10.4			64.5	
Level of Service				E	E	D	E	B			E	
Approach Delay (s)		0.0			53.9			21.1			64.5	
Approach LOS		A			D			C			E	

Intersection Summary			
HCM 2000 Control Delay	50.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	90.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	628	2	293	175	1127	0	0	691	505
Future Volume (vph)	0	0	0	628	2	293	175	1127	0	0	691	505
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	4.0	3.0	4.0			4.0	
Lane Util. Factor				0.95	0.91	0.95	1.00	0.95			0.95	
Frpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			0.98	
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	
Frt				1.00	0.99	0.85	1.00	1.00			0.94	
Flt Protected				0.95	0.96	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1681	1600	1504	1770	3539			3237	
Flt Permitted				0.95	0.96	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1681	1600	1504	1770	3539			3237	
Peak-hour factor, PHF	0.25	0.25	0.25	0.88	0.88	0.88	0.95	0.95	0.95	0.86	0.86	0.86
Adj. Flow (vph)	0	0	0	714	2	333	184	1186	0	0	803	587
RTOR Reduction (vph)	0	0	0	0	3	69	0	0	0	0	73	0
Lane Group Flow (vph)	0	0	0	378	368	231	184	1186	0	0	1317	0
Confl. Peds. (#/hr)									4			18
Confl. Bikes (#/hr)									1			1
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)				36.7	36.7	36.7	19.4	95.3			72.9	
Effective Green, g (s)				36.7	36.7	36.7	19.4	95.3			72.9	
Actuated g/C Ratio				0.26	0.26	0.26	0.14	0.68			0.52	
Clearance Time (s)				4.0	4.0	4.0	3.0	4.0			4.0	
Vehicle Extension (s)				2.0	2.0	2.0	2.5	4.0			4.0	
Lane Grp Cap (vph)				440	419	394	245	2409			1685	
v/s Ratio Prot							c0.10	0.34			c0.41	
v/s Ratio Perm				0.22	0.23	0.15						
v/c Ratio				0.86	0.88	0.59	0.75	0.49			0.78	
Uniform Delay, d1				49.2	49.5	45.0	58.0	10.7			27.1	
Progression Factor				1.00	1.00	1.00	1.03	1.03			0.88	
Incremental Delay, d2				14.8	17.9	1.4	9.5	0.6			3.1	
Delay (s)				64.0	67.4	46.5	69.2	11.7			27.1	
Level of Service				E	E	D	E	B			C	
Approach Delay (s)		0.0			60.2			19.4			27.1	
Approach LOS		A			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	33.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	76.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	409	0	142	0	0	0	0	576	613	0	1200	0
Future Volume (vph)	409	0	142	0	0	0	0	576	613	0	1200	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0	4.0		4.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	0.91		0.95	
Frpb, ped/bikes	1.00	1.00	1.00					1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00	1.00		1.00	
Frt	1.00	0.99	0.85					0.96	0.85		1.00	
Flt Protected	0.95	0.96	1.00					1.00	1.00		1.00	
Satd. Flow (prot)	1681	1603	1504					3224	1419		3539	
Flt Permitted	0.95	0.96	1.00					1.00	1.00		1.00	
Satd. Flow (perm)	1681	1603	1504					3224	1419		3539	
Peak-hour factor, PHF	0.83	0.83	0.83	0.25	0.25	0.25	0.98	0.98	0.98	0.95	0.95	0.95
Adj. Flow (vph)	493	0	171	0	0	0	0	588	626	0	1263	0
RTOR Reduction (vph)	0	14	68	0	0	0	0	72	127	0	0	0
Lane Group Flow (vph)	256	240	86	0	0	0	0	766	249	0	1263	0
Confl. Peds. (#/hr)									3			7
Confl. Bikes (#/hr)												1
Turn Type	Perm	NA	Perm					NA	Perm		NA	
Protected Phases		4						2			6	
Permitted Phases	4		4						2			
Actuated Green, G (s)	12.2	12.2	12.2					39.8	39.8		39.8	
Effective Green, g (s)	12.2	12.2	12.2					39.8	39.8		39.8	
Actuated g/C Ratio	0.20	0.20	0.20					0.66	0.66		0.66	
Clearance Time (s)	4.0	4.0	4.0					4.0	4.0		4.0	
Vehicle Extension (s)	2.0	2.0	2.0					4.0	4.0		4.0	
Lane Grp Cap (vph)	341	325	305					2138	941		2347	
v/s Ratio Prot								0.24			c0.36	
v/s Ratio Perm	c0.15	0.15	0.06						0.18			
v/c Ratio	0.75	0.74	0.28					0.36	0.27		0.54	
Uniform Delay, d1	22.5	22.4	20.2					4.5	4.1		5.3	
Progression Factor	1.00	1.00	1.00					1.00	1.00		0.68	
Incremental Delay, d2	8.0	7.3	0.2					0.5	0.7		0.3	
Delay (s)	30.5	29.7	20.4					4.9	4.8		3.9	
Level of Service	C	C	C					A	A		A	
Approach Delay (s)		27.9			0.0			4.9			3.9	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	350	24	110	0	0	0	0	1007	1189	0	1089	0
Future Volume (vph)	350	24	110	0	0	0	0	1007	1189	0	1089	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0	4.0		4.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	0.91		0.95	
Frpb, ped/bikes	1.00	1.00	0.99					0.99	0.98		1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00	1.00		1.00	
Frt	1.00	0.99	0.85					0.95	0.85		1.00	
Flt Protected	0.95	0.96	1.00					1.00	1.00		1.00	
Satd. Flow (prot)	1681	1613	1484					3202	1418		3539	
Flt Permitted	0.95	0.96	1.00					1.00	1.00		1.00	
Satd. Flow (perm)	1681	1613	1484					3202	1418		3539	
Peak-hour factor, PHF	0.98	0.98	0.98	0.25	0.25	0.25	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	357	24	112	0	0	0	0	1071	1265	0	1184	0
RTOR Reduction (vph)	0	3	58	0	0	0	0	58	213	0	0	0
Lane Group Flow (vph)	196	193	43	0	0	0	0	1557	508	0	1184	0
Confl. Peds. (#/hr)			1						3			7
Turn Type	Perm	NA	Perm					NA	Perm		NA	
Protected Phases		4						2			6	
Permitted Phases	4		4						2			
Actuated Green, G (s)	12.7	12.7	12.7					49.3	49.3		49.3	
Effective Green, g (s)	12.7	12.7	12.7					49.3	49.3		49.3	
Actuated g/C Ratio	0.18	0.18	0.18					0.70	0.70		0.70	
Clearance Time (s)	4.0	4.0	4.0					4.0	4.0		4.0	
Vehicle Extension (s)	2.0	2.0	2.0					4.0	4.0		4.0	
Lane Grp Cap (vph)	304	292	269					2255	998		2492	
v/s Ratio Prot								c0.49			0.33	
v/s Ratio Perm	0.12	0.12	0.03						0.36			
v/c Ratio	0.64	0.66	0.16					0.69	0.51		0.48	
Uniform Delay, d1	26.6	26.6	24.2					6.0	4.8		4.6	
Progression Factor	1.00	1.00	1.00					1.00	1.00		0.48	
Incremental Delay, d2	3.5	4.3	0.1					1.8	1.9		0.4	
Delay (s)	30.1	30.9	24.3					7.7	6.6		2.6	
Level of Service	C	C	C					A	A		A	
Approach Delay (s)		29.2			0.0			7.4			2.6	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	108.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Appendix F

Cumulative Plus Project Condition LOS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	650	21	120	388	115	36	6	102	78	4	34
Future Volume (vph)	34	650	21	120	388	115	36	6	102	78	4	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.5		3.5	4.5			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.97			0.89		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1770	3519		1770	3401			3122		1770	1589	
Flt Permitted	0.95	1.00		0.95	1.00			0.88		0.64	1.00	
Satd. Flow (perm)	1770	3519		1770	3401			2782		1186	1589	
Peak-hour factor, PHF	0.79	0.79	0.79	0.75	0.75	0.75	0.79	0.79	0.79	0.85	0.85	0.85
Adj. Flow (vph)	43	823	27	160	517	153	46	8	129	92	5	40
RTOR Reduction (vph)	0	2	0	0	17	0	0	103	0	0	32	0
Lane Group Flow (vph)	43	848	0	160	653	0	0	80	0	92	13	0
Confl. Peds. (#/hr)			4			8	5					5
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			4			4	
Permitted Phases							4			4		
Actuated Green, G (s)	4.0	29.0		12.1	37.1			13.5		13.5	13.5	
Effective Green, g (s)	4.0	29.0		12.1	37.1			13.5		13.5	13.5	
Actuated g/C Ratio	0.06	0.44		0.18	0.56			0.20		0.20	0.20	
Clearance Time (s)	3.5	4.5		3.5	4.5			4.0		4.0	4.0	
Vehicle Extension (s)	2.0	4.0		3.0	4.0			4.0		4.0	4.0	
Lane Grp Cap (vph)	106	1532		321	1894			563		240	322	
v/s Ratio Prot	0.02	c0.24		c0.09	0.19						0.01	
v/s Ratio Perm								0.03		c0.08		
v/c Ratio	0.41	0.55		0.50	0.34			0.14		0.38	0.04	
Uniform Delay, d1	30.2	14.0		24.5	8.1			21.8		23.0	21.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.5		1.2	0.2			0.2		1.4	0.1	
Delay (s)	31.1	14.5		25.7	8.2			22.0		24.3	21.4	
Level of Service	C	B		C	A			C		C	C	
Approach Delay (s)		15.3			11.6			22.0			23.4	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	66.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	47.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	410	41	243	384	39	94	12	247	90	10	26
Future Volume (vph)	14	410	41	243	384	39	94	12	247	90	10	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.5		3.5	4.5			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99			0.90		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1770	3484		1770	3486			3124		1770	1646	
Flt Permitted	0.95	1.00		0.95	1.00			0.86		0.43	1.00	
Satd. Flow (perm)	1770	3484		1770	3486			2715		799	1646	
Peak-hour factor, PHF	0.83	0.83	0.83	0.90	0.90	0.90	0.85	0.85	0.85	0.86	0.86	0.86
Adj. Flow (vph)	17	494	49	270	427	43	111	14	291	105	12	30
RTOR Reduction (vph)	0	9	0	0	5	0	0	208	0	0	21	0
Lane Group Flow (vph)	17	534	0	270	465	0	0	208	0	105	21	0
Confl. Peds. (#/hr)			1			1	2					2
Confl. Bikes (#/hr)			1			1						
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			4			4	
Permitted Phases							4			4		
Actuated Green, G (s)	1.2	24.0		16.2	39.0			20.7		20.7	20.7	
Effective Green, g (s)	1.2	24.0		16.2	39.0			20.7		20.7	20.7	
Actuated g/C Ratio	0.02	0.33		0.22	0.53			0.28		0.28	0.28	
Clearance Time (s)	3.5	4.5		3.5	4.5			4.0		4.0	4.0	
Vehicle Extension (s)	2.0	4.0		3.0	4.0			4.0		4.0	4.0	
Lane Grp Cap (vph)	29	1146		393	1864			770		226	467	
v/s Ratio Prot	0.01	c0.15		c0.15	0.13						0.01	
v/s Ratio Perm								0.08		c0.13		
v/c Ratio	0.59	0.47		0.69	0.25			0.27		0.46	0.04	
Uniform Delay, d1	35.6	19.4		26.0	9.1			20.2		21.5	18.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	18.0	0.4		4.9	0.1			0.3		2.1	0.1	
Delay (s)	53.6	19.8		31.0	9.2			20.5		23.6	19.0	
Level of Service	D	B		C	A			C		C	B	
Approach Delay (s)		20.8			17.1			20.5			22.3	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	72.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	119	29	679	95	30	14	513	605	41	11	854	114
Future Volume (vph)	119	29	679	95	30	14	513	605	41	11	854	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.7		5.1		4.7	5.0		4.0	5.1	5.1
Lane Util. Factor		1.00	0.88		0.95		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1791	2787		3364		3433	3496		1770	3539	1546
Flt Permitted		0.96	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1791	2787		3364		3433	3496		1770	3539	1546
Peak-hour factor, PHF	0.91	0.91	0.91	0.75	0.75	0.75	0.92	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	131	32	746	127	40	19	558	658	45	12	909	121
RTOR Reduction (vph)	0	0	0	0	8	0	0	0	0	0	0	72
Lane Group Flow (vph)	0	163	746	0	178	0	558	703	0	12	909	49
Confl. Peds. (#/hr)						4			6			9
Turn Type	Split	NA	pm+ov	Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4	5	3	3		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)		13.8	40.2		17.8		26.4	76.1		3.6	52.5	52.5
Effective Green, g (s)		13.8	40.2		17.8		26.4	76.1		3.6	52.5	52.5
Actuated g/C Ratio		0.11	0.31		0.14		0.20	0.59		0.03	0.40	0.40
Clearance Time (s)		4.6	4.7		5.1		4.7	5.0		4.0	5.1	5.1
Vehicle Extension (s)		2.5	2.0		2.0		2.0	4.5		2.0	3.0	3.0
Lane Grp Cap (vph)		190	861		460		697	2046		49	1429	624
v/s Ratio Prot		0.09	c0.18		c0.05		0.16	0.20		0.01	c0.26	
v/s Ratio Perm			0.09									0.03
v/c Ratio		0.86	0.87		0.39		0.80	0.34		0.24	0.64	0.08
Uniform Delay, d1		57.1	42.4		51.1		49.3	14.0		61.9	31.1	23.9
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		29.4	8.8		0.2		6.2	0.5		1.0	2.2	0.2
Delay (s)		86.5	51.2		51.3		55.5	14.4		62.8	33.3	24.1
Level of Service		F	D		D		E	B		E	C	C
Approach Delay (s)		57.5			51.3			32.6			32.5	
Approach LOS		E			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	40.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	52	560	64	38	14	566	754	138	12	586	87
Future Volume (vph)	130	52	560	64	38	14	566	754	138	12	586	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.7		5.1		4.7	5.0		4.0	5.1	5.1
Lane Util. Factor		1.00	0.88		0.95		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00		1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1798	2787		3376		3433	3435		1770	3539	1534
Flt Permitted		0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1798	2787		3376		3433	3435		1770	3539	1534
Peak-hour factor, PHF	0.89	0.89	0.89	0.86	0.86	0.86	0.92	0.92	0.92	0.72	0.72	0.72
Adj. Flow (vph)	146	58	629	74	44	16	615	820	150	17	814	121
RTOR Reduction (vph)	0	0	0	0	9	0	0	0	0	0	0	74
Lane Group Flow (vph)	0	204	629	0	125	0	615	970	0	17	814	47
Confl. Peds. (#/hr)						3			6			13
Confl. Bikes (#/hr)									1			1
Turn Type	Split	NA	pm+ov	Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4	5	3	3		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)		18.6	48.6		17.8		30.0	81.4		3.5	54.1	54.1
Effective Green, g (s)		18.6	48.6		17.8		30.0	81.4		3.5	54.1	54.1
Actuated g/C Ratio		0.13	0.35		0.13		0.21	0.58		0.02	0.39	0.39
Clearance Time (s)		4.6	4.7		5.1		4.7	5.0		4.0	5.1	5.1
Vehicle Extension (s)		2.5	2.0		2.0		2.0	4.5		2.0	3.0	3.0
Lane Grp Cap (vph)		238	967		429		735	1997		44	1367	592
v/s Ratio Prot		c0.11	0.14		c0.04		c0.18	0.28		0.01	c0.23	
v/s Ratio Perm			0.09									0.03
v/c Ratio		0.86	0.65		0.29		0.84	0.49		0.39	0.60	0.08
Uniform Delay, d1		59.4	38.5		55.4		52.7	17.1		67.2	34.2	27.2
Progression Factor		1.00	1.00		1.00		0.87	0.78		1.00	1.00	1.00
Incremental Delay, d2		24.6	1.2		0.1		6.9	0.7		2.0	1.9	0.3
Delay (s)		84.0	39.7		55.5		52.4	14.1		69.2	36.1	27.5
Level of Service		F	D		E		D	B		E	D	C
Approach Delay (s)		50.6			55.5			29.0			35.6	
Approach LOS		D			E			C			D	

Intersection Summary			
HCM 2000 Control Delay	36.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	608	7	371	198	798	0	0	926	726
Future Volume (vph)	0	0	0	608	7	371	198	798	0	0	926	726
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	4.0	3.0	4.0			4.0	
Lane Util. Factor				0.95	0.91	0.95	1.00	0.95			0.95	
Frpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			0.99	
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	
Frt				1.00	0.97	0.85	1.00	1.00			0.93	
Flt Protected				0.95	0.96	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1681	1585	1504	1770	3539			3270	
Flt Permitted				0.95	0.96	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1681	1585	1504	1770	3539			3270	
Peak-hour factor, PHF	0.25	0.25	0.25	0.89	0.89	0.89	0.98	0.98	0.98	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	683	8	417	202	814	0	0	1018	798
RTOR Reduction (vph)	0	0	0	0	7	154	0	0	0	0	104	0
Lane Group Flow (vph)	0	0	0	382	373	192	202	814	0	0	1712	0
Confl. Peds. (#/hr)									3			6
Confl. Bikes (#/hr)												1
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)				31.4	31.4	31.4	18.2	80.6			59.4	
Effective Green, g (s)				31.4	31.4	31.4	18.2	80.6			59.4	
Actuated g/C Ratio				0.26	0.26	0.26	0.15	0.67			0.49	
Clearance Time (s)				4.0	4.0	4.0	3.0	4.0			4.0	
Vehicle Extension (s)				2.0	2.0	2.0	2.5	4.0			4.0	
Lane Grp Cap (vph)				439	414	393	268	2377			1618	
v/s Ratio Prot							c0.11	0.23			c0.52	
v/s Ratio Perm				0.23	0.24	0.13						
v/c Ratio				0.87	0.90	0.49	0.75	0.34			1.06	
Uniform Delay, d1				42.4	42.8	37.5	48.8	8.4			30.3	
Progression Factor				1.00	1.00	1.00	1.11	1.21			1.00	
Incremental Delay, d2				16.4	21.7	0.3	9.4	0.3			39.6	
Delay (s)				58.8	64.5	37.8	63.6	10.5			69.9	
Level of Service				E	E	D	E	B			E	
Approach Delay (s)		0.0			54.2			21.0			69.9	
Approach LOS		A			D			C			E	

Intersection Summary			
HCM 2000 Control Delay	52.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	90.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	628	2	306	175	1148	0	0	712	518
Future Volume (vph)	0	0	0	628	2	306	175	1148	0	0	712	518
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	4.0	3.0	4.0			4.0	
Lane Util. Factor				0.95	0.91	0.95	1.00	0.95			0.95	
Frpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			0.98	
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	
Frt				1.00	0.99	0.85	1.00	1.00			0.94	
Flt Protected				0.95	0.96	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1681	1599	1504	1770	3539			3238	
Flt Permitted				0.95	0.96	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1681	1599	1504	1770	3539			3238	
Peak-hour factor, PHF	0.25	0.25	0.25	0.88	0.88	0.88	0.95	0.95	0.95	0.86	0.86	0.86
Adj. Flow (vph)	0	0	0	714	2	348	184	1208	0	0	828	602
RTOR Reduction (vph)	0	0	0	0	3	65	0	0	0	0	73	0
Lane Group Flow (vph)	0	0	0	378	370	248	184	1208	0	0	1357	0
Confl. Peds. (#/hr)									4			18
Confl. Bikes (#/hr)									1			1
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)				36.9	36.9	36.9	19.4	95.1			72.7	
Effective Green, g (s)				36.9	36.9	36.9	19.4	95.1			72.7	
Actuated g/C Ratio				0.26	0.26	0.26	0.14	0.68			0.52	
Clearance Time (s)				4.0	4.0	4.0	3.0	4.0			4.0	
Vehicle Extension (s)				2.0	2.0	2.0	2.5	4.0			4.0	
Lane Grp Cap (vph)				443	421	396	245	2403			1681	
v/s Ratio Prot							c0.10	0.34			c0.42	
v/s Ratio Perm				0.22	0.23	0.17						
v/c Ratio				0.85	0.88	0.63	0.75	0.50			0.81	
Uniform Delay, d1				49.0	49.4	45.5	58.0	10.9			27.9	
Progression Factor				1.00	1.00	1.00	1.03	1.03			0.87	
Incremental Delay, d2				14.2	17.9	2.2	9.5	0.6			3.6	
Delay (s)				63.2	67.3	47.7	69.3	11.9			27.9	
Level of Service				E	E	D	E	B			C	
Approach Delay (s)		0.0			60.1			19.5			27.9	
Approach LOS		A			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	33.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	414	0	142	0	0	0	0	582	613	0	1206	0
Future Volume (vph)	414	0	142	0	0	0	0	582	613	0	1206	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0	4.0		4.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	0.91		0.95	
Frpb, ped/bikes	1.00	1.00	1.00					1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00	1.00		1.00	
Frt	1.00	0.99	0.85					0.96	0.85		1.00	
Flt Protected	0.95	0.96	1.00					1.00	1.00		1.00	
Satd. Flow (prot)	1681	1603	1504					3225	1419		3539	
Flt Permitted	0.95	0.96	1.00					1.00	1.00		1.00	
Satd. Flow (perm)	1681	1603	1504					3225	1419		3539	
Peak-hour factor, PHF	0.83	0.83	0.83	0.25	0.25	0.25	0.98	0.98	0.98	0.95	0.95	0.95
Adj. Flow (vph)	499	0	171	0	0	0	0	594	626	0	1269	0
RTOR Reduction (vph)	0	14	67	0	0	0	0	71	127	0	0	0
Lane Group Flow (vph)	259	243	87	0	0	0	0	773	249	0	1269	0
Confl. Peds. (#/hr)									3			7
Confl. Bikes (#/hr)												1
Turn Type	Perm	NA	Perm					NA	Perm		NA	
Protected Phases		4						2			6	
Permitted Phases	4		4						2			
Actuated Green, G (s)	12.2	12.2	12.2					39.8	39.8		39.8	
Effective Green, g (s)	12.2	12.2	12.2					39.8	39.8		39.8	
Actuated g/C Ratio	0.20	0.20	0.20					0.66	0.66		0.66	
Clearance Time (s)	4.0	4.0	4.0					4.0	4.0		4.0	
Vehicle Extension (s)	2.0	2.0	2.0					4.0	4.0		4.0	
Lane Grp Cap (vph)	341	325	305					2139	941		2347	
v/s Ratio Prot								0.24			c0.36	
v/s Ratio Perm	c0.15	0.15	0.06						0.18			
v/c Ratio	0.76	0.75	0.29					0.36	0.27		0.54	
Uniform Delay, d1	22.5	22.4	20.2					4.5	4.1		5.3	
Progression Factor	1.00	1.00	1.00					1.00	1.00		0.68	
Incremental Delay, d2	8.4	7.9	0.2					0.5	0.7		0.3	
Delay (s)	30.9	30.4	20.4					4.9	4.8		3.9	
Level of Service	C	C	C					A	A		A	
Approach Delay (s)		28.3			0.0			4.9			3.9	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	92.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	359	24	110	0	0	0	0	1019	1189	0	1101	0
Future Volume (vph)	359	24	110	0	0	0	0	1019	1189	0	1101	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0	4.0		4.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	0.91		0.95	
Frpb, ped/bikes	1.00	1.00	0.99					0.99	0.98		1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00	1.00		1.00	
Frt	1.00	0.99	0.85					0.95	0.85		1.00	
Flt Protected	0.95	0.96	1.00					1.00	1.00		1.00	
Satd. Flow (prot)	1681	1613	1484					3206	1418		3539	
Flt Permitted	0.95	0.96	1.00					1.00	1.00		1.00	
Satd. Flow (perm)	1681	1613	1484					3206	1418		3539	
Peak-hour factor, PHF	0.98	0.98	0.98	0.25	0.25	0.25	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	366	24	112	0	0	0	0	1084	1265	0	1197	0
RTOR Reduction (vph)	0	3	56	0	0	0	0	55	219	0	0	0
Lane Group Flow (vph)	201	197	45	0	0	0	0	1560	515	0	1197	0
Confl. Peds. (#/hr)			1						3			7
Turn Type	Perm	NA	Perm					NA	Perm		NA	
Protected Phases		4						2			6	
Permitted Phases	4		4						2			
Actuated Green, G (s)	12.9	12.9	12.9					49.1	49.1		49.1	
Effective Green, g (s)	12.9	12.9	12.9					49.1	49.1		49.1	
Actuated g/C Ratio	0.18	0.18	0.18					0.70	0.70		0.70	
Clearance Time (s)	4.0	4.0	4.0					4.0	4.0		4.0	
Vehicle Extension (s)	2.0	2.0	2.0					4.0	4.0		4.0	
Lane Grp Cap (vph)	309	297	273					2248	994		2482	
v/s Ratio Prot								c0.49			0.34	
v/s Ratio Perm	0.12	0.12	0.03						0.36			
v/c Ratio	0.65	0.66	0.16					0.69	0.52		0.48	
Uniform Delay, d1	26.5	26.5	24.0					6.1	4.9		4.7	
Progression Factor	1.00	1.00	1.00					1.00	1.00		0.51	
Incremental Delay, d2	3.7	4.3	0.1					1.8	1.9		0.4	
Delay (s)	30.2	30.8	24.1					7.9	6.8		2.8	
Level of Service	C	C	C					A	A		A	
Approach Delay (s)		29.2			0.0			7.5			2.8	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	109.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			